KANSEI ENGINEERING AND EMOTION RESEARCH INTERNATIONAL CONFERENCE 2010 KEER2010

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KEER

Welcome to KEER2010

Améziane AOUSSAT
Conference Chair
KEER2010

Professor and Director of
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Arts et Métiers ParisTech, FRANCE

On behalf of Arts et Métiers ParisTech, it is my great pleasure to welcome you to Paris for the International Conference on Kansei Engineering and Emotion Research: KEER 2010.

This event has been co-organized by the Japanese Society of Kansei Engineering, the Taiwan Institute of Kansei, and Arts et Métiers ParisTech. KEER 2010 is organized for the first time in Europe, more specifically in Paris. We are all the more proud to host this conference within our School, which is one of the oldest Schools of Engineering in France, with a culture that focuses strongly on innovation in technology and processes.

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The overall theme of the conference is “Crossing places, crossing experiences, crossing minds”. We sincerely hope that the conference will set a strong ground for future scientific and cultural exchanges. With time, we hope that the contacts you will make here will help construct long-lasting bridges between our cultures, and bring us closer together in mutually beneficial work relationships.

We have been fortunate this year to receive many contributions from25countries worldwide, which added up to 410 submitted papers and posters, over 230 of which were selected in the final program. In the next three days, we have organized 7 simultaneous sessions to host presentations from the authors, as well as two keynote presentations every day. We hope each and every one of you will find nourishment for your scientific curiosity and for future lively and fascinating debates.

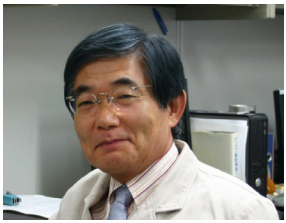
I am greatly thankful to all authors for their excellent contributions, to the program committee members, and to the referees for their contribution and valuable insight during the reviewing process. I would also like to thank all the people who have helped with organizing the conference: Prof. Hisao SHIIZUKA (Kogakuin University, President of JSKE), Prof. Kuohsiang CHEN (National Cheng-Kung University), Prof. Toshimasa YAMANAKA (University of Tsukuba), Prof. Yu-Ming CHANG (Southern Taiwan Universty of Technology), Assistant Prof. Pierre LEVY (Eindhoven University of Technology) and Assistant Prof. Carole BOUCHARD (Arts et Métiers ParisTech). Particular thanks go to the members of the KEER 2010 organizing committee here in Arts et Métiers ParisTech.

Welcome to Paris. We wish you all a very fruitful and convivial conference.

Améziane AOUSSAT

Conference Chair

A message from JSKE



Hisao SHIIZUKA
President of Japan Society of Kansei Engineering
Conference Co-Chair
KEER2010

Professor
Department of Information Design

Kogakuin University, JAPAN

On behalf of the Japan Society of Kansei Engineering (JSKE) I would like to extend a hearty welcome to the participants in KEER2010. This is a memorable conference, because it is the first time KEER has been held overseas. The first, KEER2007, was held in Sapporo in October 2007, and the second, KEER2009, was held in Osaka in March 2009. KEER2010 was jointly organized by JSKE, by Arts et Métiers ParisTech, and by TIK. It is especially significant that Kansei Engineering and Emotional Research is finding its way onto the world stage, with this first overseas conference scheduled to open in Paris. This means that KEER2010 will provide an ideal opportunity for Kansei to attract the attention of many people around the world.

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The greatest mission of academia is to feed research results back into society. The number of contributions to JSKE's academic journal has been steadily growing, and interesting papers that deal with topics across various academic disciplines are becoming popular among readers. JSKE has been publishing its academic journal, Kansei Engineering International Journal, in English since its foundation. This is proof of JSKE's strong commitment to promulgating its research results worldwide.

Generally, there seem to be many who think Kansei engineering is a method aimed at treating Kansei from an engineering perspective. In this approach, engineering is considered necessary to deal with Kansei. But I don't think so. In my view, it is more appropriate to think that engineers should adopt Kansei or find out more about it. Engineering is an academic discipline that has been developed with an emphasis on its usefulness to humanity. However, it has become increasingly difficult for engineering to be continuously useful to, and valued by, people by maintaining a framework that attaches importance only to craftsmanship and functionality. Therefore, the time has arrived for engineering to become reconciled with Kansei because of a paradigm shift in values. Sensitive people are those who are creative. The development of elemental technology and innovation does not always gain recognition as a creative task. If the development of both these things were to extend into the creative side of academia, many people might doubt that it would constitute true engineering. Kansei is a breakthrough in our efforts to reconcile creativity and engineering.

I am sure people still clearly remember a surge of interest in Kansei following the "Kansei value creation initiative" launched by the Japanese Ministry of Economy, Trade, and Industry last year. However, it is true that there remain tasks in many areas, such as the need to look at Kansei values from a new perspective to distill the universal features of Kansei or lay down guidelines for a concrete approach to it. The natural consequence of this in scientific discussions is the quantification of Kansei and, importantly, the adoption

of a brain science approach to this discipline. I believe this must be discussed more actively. What I mean is that we need to know how to universally grasp the art of the great masters and extract the essence of Kansei from it.

I shall be more than happy to help many of you to develop an interest in Kansei research by providing clues to the discipline of Kansei.

Last but not least, I would like to sincerely thank Professor Améziane Aoussat of Arts et Métiers ParisTech for all the trouble he has taken to jointly host KEER2010.

Hisao SHIIZUKA

President of Japan Society of Kansei Engineering

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A message from TIK

Prof. Kuohsiang CHEN
President of Taiwan Institute of Kansei

Professor
Department of Industrial Design

National Cheng Kung University, TAIWAN

On behalf of the Taiwan Institute of Kansei (TIK), I would like to welcome the participants to KEER2010. This year, the KEER Conference will cover many areas related to Kansei and emotion research, with a worldwide scope and with an increasing contribution of the Taiwanese researchers in these fields. This growing interest of Taiwanese researchers in the field of Kansei is partly due to the continuous disseminating action led by the Taiwanese Institute of Kansei since 2007.

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KEER 2010 Conference will be a great and nice event for promoting Kansei Studies and for sharing Kansei knowledge between academicians and practitioners.

I would like to warmly thank Professor Améziane Aoussat, Chair of KEER2010, and Professor Hisao Shiizuka, President of JSKE, for the co-organisation of KEER2010.

We wish you a very nice conference.

Kuohsiang CHEN

President of Taiwan Institute of Kansei

Keynote 1

Prof. Akira HARADA

President, Sapporo City University
JAPAN

Prof. Akira Harada worked as a product planner at the GK Industrial Design Associate until 1978. He moved to the Faculty of Institute of Art and Design of the University of Tsukuba. (1978-2005) He studied cognitive science at the Illinois Institute of technology in USA, He began to research on the interface design (1985-1986). After that, he started to study the theory of interaction and function of Kansei. He was a board member to establish the Japan Society of Kansei Engineering (JSKE) 1999. He gave a lecture "KANSEI evaluation through network and log analysis" at the 1st International conference on Design and Emotion, TUDelht, 1999. He established the Doctoral major course in the graduate school of comprehensive human sciences of the University of Tsukuba with such as Brain Sciences, Cognitive Sciences, Disability Sciences, and Kansei Information sciences, 2001. He was a former chair of Japanese Society for the Science of Design (JSSD), and a former chair of Japan Society of Kansei Engineering (JSKE).

Service Design with Kansei Engineering

In order to grasp function of Kansei, it is important to describe the function of Kansei and to build the model. Since Kansei is very comprehensive function, not vertical type research organization as before but trans-disciplinary approach is required for it. For a new product creation, the information by the Kansei-action which man is performing, and Kansei information data is utilized, and we are researching the interactive product development. We succeeded Kansei information measurement technical development and Kansei Interaction technical development using brain wave technology. In the University of Tsukuba doctoral program, Neuroscience, Psychology, Disability Science, and Science of Arts were integrated. This educational program of Trans-disciplinary approach aims to solve various compound subjects in society and industry. The complicated technical solution in man/woman, nature, society, environment, and industry can be discovered. It is because the function of man's Kansei was not considered to have played the important role by these complicated problems until now. Since many cases of these Kansei-processes were not intentional action but unconscious actions, it was not set as the scientific field. However, such unconscious action is just the trigger that makes man's final intention decisive. According to some "service design" examples, I would like to introduce that research of Kansei engineering and feeling carries out a big contribution to our social systems.

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Keynote 2

Prof. Kees OVERBEEKE

Eindhoven University of Technology
THE NETHERLANDS

Kees Overbeeke studied psychology at the Katholieke Universiteit Leuven, Belgium (Ma 1974). After working there, he moved to the Faculty of Industrial Design Engineering at the Delft University of Technology, the Netherlands, where he gained his PhD (1988) on spatial perception on flat screens. He headed the group of Form Theory as Associate Professor until his move to the Department of Industrial Design of the TU/e in 2002. During the 2005-2006 academic year he was Distinguished Nierenberg Chair at Design CMU Pittsburgh, USA. In 2006 he was appointed full professor at TU/e. He now heads the Designing Quality in Interaction group (DQI). DQI consists of seven PhD-ed designers, and is one of the leading design research groups in the world. He strongly believes that design research should be theory driven, and that collaboration with industry is paramount (among others, collaboration with Philips, BMW, Unilever, Nissan, Adidas, and Microsoft).

Kees Overbeeke initiated several new subjects in design research: design and emotion, funology, aesthetics of interaction, rich interaction and design and ethics. He published extensively on these subjects in journals, books and conference papers. He initiated the "Design and Emotion" and the "Designing for Pleasurable Products and Interfaces DPPI"conferences. He was keynote speaker, and member of the scientific committee, of several international conferences, and has been plenary speaker at CHI 2009 in Boston, USA.

From Kansei, to emotion to aesthetics to ethics in interaction design

The last 25 years I was part of parallel developments in Japan and the western world. As Japan developed Kansei, the West re-discovered emotion, specifically in interaction design research. Several people of our group visited Tsukuba, myself included. In the mean time a first PhD project on the role of emotion in design was finished. As all of our work, it focuses on action as the typical human way of opening up meaning. Therefore, designed artefacts serve as “physical hypothesis”. Research through design is our method. Emotion in interaction design quite naturally moves towards aesthetics of interaction. Again we contacted Tsukuba, and did a workshop with their and our students working together. Aesthetics was opened up through music. Recently we included “ethics” into our teaching and research: the good and the beautiful touch. My talk is illustrated with a myriad of filmclips showcasing our work.

I conclude by stating that design is essentially a discipline that operates on a phenomenological level. Opening up the poetic dimension at people’s experience level is therefore a must in design research.

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Keynote 3

Dr. Simon SCHÜTTE

Linköping University
SWEDEN

Simon Schütte studied mechanical engineering at Braunschweig University in Germany. After a period working for Volvo AB, he returned to the academy and is now an assistant professor at Linköping university in the area of machine design and product development. He has been working with Kansei Engineering methodology since 2000 and presented is PhD thesis in 2005 on the topic. It was the first PhD thesis work published on Kansei Engineering methodology in English language. In the meantime he has published a number of publications among them a book, several book chapters and journal papers; most of them describe product development projects using Kansei Engineering as main method. Simon Schütte has also been involved as a consultant in European industrial companies developing Kansei products.

Adjusting Kansei Engineering methodology to European company philosophy

Affective Design and Kansei Engineering in particular is a relatively new field of research in the West. Linköping University in Sweden has been pioneering research and application in Europe since 1999. A close cooperation to Japanese researchers and companies was prudent to overcome initial difficulties. In early European studies, severe difficulties were obtained in the attempts to apply the original Japanese methodology. Reasons for this were manifold and complex. One cause was certainly the shortage of competence on affective design in European companies, but also the fact that incitements for improvement of product design seemed to be lacking. Moreover, the Japanese data collection systems were in many test cases not yielding valid results. Among other problems the traditional 5-point semantic differential questionnaires, one of the heart pieces of Japanese Kansei Engineering and works perfectly in Japan, created severe problems. In consequence, the researchers started to improve and validate the methodology and adapt it to a European context before being able to carry out “real” studies. A new “European” rating scale was developed and validated. Also new methods for data reduction were introduced in order to reduce data collection time for the individuals and in this way improve data quality. As a reaction on the companies lacking competence of the new area a software was developed collecting and evaluation data using QT1 and Rough sets algorithms. Since then Kansei Engineering group at Linköping University has been cooperating with several companies e.g. Electrolux Volvo, Saab, Scania, Toyota/BT. This presentation will also give examples on Kansei products developed in Europe.

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Keynote 4

Prof. Lola Cañamero
University of Hertfordshire
UNITED KINGDOM

and

Dr. Nadia Berthouze
University College London, UCLIC
UNITED KINGDOM

Lola Cañamero is Reader in Adaptive Systems in the School of Computer Science at University of Hertfordshire, which she joined in 2001. She received a BA and MA in Philosophy from the Complutense University of Madrid, and a PhD in Computer Science (1995) from the University of Paris-XI. She worked as a post-doc with Rodney Brooks at the MIT AI-Lab and with Luc Steels at the VUB AI-Lab. Her research revolves around emotion modeling for autonomous and social robots and agents, which she approaches from multiple perspectives, including developmental, evolutionary, functional/adaptational, and social. Among other relevant publications, she has edited the book Animating Expressive Characters for Social Interaction (John Benjamins, 2008) and the special issue of the International Journal of Humanoid Robotics "Achieving Human-Like Qualities in Interactive Virtual and Physical Humanoids" (2006). She currently coordinates the EU-funded multidisciplinary project FEELIX GROWING (www.feelix-growing.org) on socially situated emotional development.

Since 2006, Nadia Berthouze is a lecturer the University College London. After her PhD in Computer Science at the University of Milan (Italy), she was a postdoctoral fellow at the Electrotechnical Laboratory (Japan) where she worked in the area of Multimedia information with a focus on the interpretation of affective content. In 2000, she was appointed as lecturer at the University of Aizu in Japan where she extended her interest to the study of non-verbal affective communication. The premise of her research is that affect and subjective experience should be factored into the design of interactive technology. At the centre of her research is the creation of interactive systems that exploit body movement as a medium to induce, recognize and measure the quality of experience of humans. She is investigating the various factors involved in the way body movement is used to express and experience emotions, including cross-cultural differences.

Designing Affective Artifacts that Support and Engage Humans: Embodied Emotion, Interaction and Expression

The design of affective technology that can effectively interact with and support humans requires multidisplinary research efforts addressing multiple aspects of emotion modelling, behavior and expression, and Human-Machine / Human-Robot Interaction. In this talk we provide an overview of some of these aspects, covering both how to model emotional systems that can interact naturally with humans (part I), and how to exploit the way humans interact naturally in order to build such technology (part II).

Part I (Lola Cañamero): Emotional Robots: Affective Companions or Scientific Tools? "Affective" and "social" robots that can display and recognize simple forms of emotions are becoming increasingly popular. Besides their entertainment potential, they can be useful tools to support us cognitively and emotionally in our everyday activities. Although research in this direction is witnessing important advances, a big challenge that researchers in affective robotics still face is the design of robots that humans are willing to accept and trust. This involves achieving natural interactions that are socially and emotionally adapted, believable and engaging to the human. In this talk I will illustrate various aspects of my research on modeling emotional systems, interaction and expression in robots towards this goal, and which also help scientists understand the nature, functions, origins, development, and adaptive value of emotions.

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Part II (Nadia Berthouze): Body movement in affective HCI (HMI). With technology becoming ubiquitous, it becomes increasingly important for human-machine interaction to exploit the various communication channels available to humans. Body movement is one modality with the potential to enable a more natural form of interaction and facilitate access to technology to a broader population to access technology. Although body movement has been garnering increasing interest in recent years, it has been mainly used as a way to control the technology with little attention to how technology can exploit body movement to enhance emotional and engagement experience as well as to support cognitive processes. In this talk, I will discuss this unique potential by discussing a number of studies from various disciplines, including HCI. I will conclude by identifying a set of questions that these studies raise to designers of affective technologies.

Keynote 5

Prof. Kuohsiang CHEN

National Cheng Kung University
TAIWAN

Kuohsiang Chen, with Ph.D. and M.S. degrees from the Institute of Design, IIT, and serving as section editor for the Journal of Design, is Professor of Industrial Design at National Cheng Kung University, Taiwan. Dr. Chen has conducted a cross-university research project on Integrated Multi-sensory Kansei Engineering for Product Development (2002-2006), and has been the Deputy Director for the Educational Resources Center for Life Trendy Goods Design (2004-2007) at NCKU. His professional experiences include: Product Designer for SINO Design & Development and the SAMPO Company; Diagrams Researcher & Programmer for SPSS Inc.; and Design Specialist for the China External Trade Development Council, the China Productivity Center and the Council of Labor Affairs. His principal areas of research interests cover: form generation and style association, Kansei Engineering, and interaction design. Dr. Chen has publications in areas of form and style languages, computer-supported formal design, influential factors in interface design, and Kansei Engineering. He is now a guest researcher at TU Delft, Netherland, after a short visiting at Tsukuba University, Japan.

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Kansei Research in Taiwan

After accepting the enthusiastic encouragements from the researchers around the world at the KEER 2007 in Sapporo, Japan, and with tremendous efforts of my colleagues and students at NCKU, Taiwan Institute of Kansei (TIK) was formed on the 13th of December, 2008. But, long before that, the first master thesis on Kansei Engineering “A Concise Procedure for Executing Kansei Engineering” was completed at National Chiao Tung University in 1996. A special interest group on Kansei Engineering was established at NCKU in 1999, followed by the first special section on Kansei Engineering in the Technology and Teaching Conference organized by Ming Chi University of Technology in 2000. The first journal paper on Kansei Engineering “A Study on the Color and Style Collocation of Mobile Phones Using Neural Network Method” was published on Journal of the Chinese Institute of Industrial Engineers in 2001. And the first PhD Dissertation “The Evaluation Bases and Design Optimization for Product Form Attractiveness” was completed at National Cheng Kung University in 2004.

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With these milestones as background, this presentation will first address the forming process of TIK in detail, followed by offering some overall statistical figures of Kansei research in Taiwan, and finished by brief descriptions of the two integrated researches “An Integrated Research on the Application of Compound Kansei Engi

Keynote 6

TOYOTA EUROPE

Carole FAVART
and
Daniel ESQUIVEL ELIZONDO

Carole FAVART is since 2003 General Manager of European Projects 2, a design department in Research & Development. Her first education is in Interior and Product Design. She set up a Design Company in 1990, in which 3 departments were created: Transportation (aircrafts and boats), Graphic Design (and management of Brand Identity) and Design Strategy. At the end of 1999, she joined RENAULT where she set up a new Design Direction, and was responsible for Colour, Materials and Graphic Design, including navigation systems and Brand identity, such as Formula 1. Toyota Europe newly created a new cross-functional Division based on multi-expertises, with R&D, Marketing and Style Members. Strongly convinced that leading edge technologies, and long-term product strategies have to combine with the design to strengthen the innovation capacity and the brands' DNA, She also works for Lexus brand in order to express European expectations to TMC (Toyota Motors Corporation) Japan.

From Mexico, as Industrial Engineer, Daniel ESQUIVEL ELIZONDO came to France in 2004 to follow the 2-year Master in Research at the LCPI. There he discovered the exciting fields of innovation and design that had the opportunity to put into practice during his final research project at Toyota in Belgium, with the mission "create of a tool to measure the Kansei of car interiors".Since then, hired by Toyota in 2006, he has contributed to new model concept definition by defining the key items to improve the interior Kansei. Together with the Kansei Group, he is currently working on a user-experience based approach including multi-sensory stimuli and contextual scenarios.

Choosing your car depends on a mix of both logical and emotional reasons mutually influencing each other. Owning it, driving it, showing it to your friends, all this can play a big role in the final impression of the user experience. In Toyota, the Kansei Group leads a cross functional activity to create the future experiences in mobility. As a pluri-disciplinary team, we explore innovative synergies between different competencies creating potential solutions on customer needs from technological innovations. In order to understand the customer's viewpoint, we conduct research on objective and subjective criteria while taking into account the most pertinent scenarios of usage. Our approach, based in Kansei Engineering principles, is enriched by other methodologies as Engineering Emotions, Experience Design, Interaction Design and Sensory Evaluation.

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(80) Improvement of the Valencian Retail Stores Competitiveness applying Emotional Engineering Methodologies

CAMPOS Nadia, Instituto De Biomecánica De Valencia, Spain
MARZO Raquel, Instituto De Biomecánica De Valencia, Spain
ALCÁNTARA Enrique, Instituto De Biomecáncia De Valencia, Spain
SORIANO Carolina, Instituto De Biomecáncia De Valencia, Spain
CEMBRERO Paula, Instituto De Biomecáncia De Valencia, Spain
SUCH Mª José, Instituto De Biomecáncia De Valencia, Spain

As the economy has moved from market centred to user driven (Gobé, 2000), nowadays industry is faced with a new consumer who demands the "products they desire, exactly when they want them, through venues that are both inspiring and intimately responsive to their needs" (Gobé, 2000). In today's market, product and service differentiation not only comes from delivering top quality services but from delivering the right emotional appeal along with them. The present paper aims to explain how Emotional Engineering Techniques can help the Valencian Trade to improve its competitiveness. While these methodologies are commonly used in the concept and product evaluation stages, the present case study aims to go one-step further by applying them in the stage of the development of a Strategic Plan. The Confederación de Empresarios del Comercio Valenciano (CECOVAL), with the collaboration of the Instituto de Biomecánica de Valencia (IBV) has approached the study of consumers' emotional perception of Valencian retail stores, as well as their influence on the intention of buying and recommending a store. In this project the emotional success factors were identified in order to develop a Valencian trade diagnostic. Firstly, identifying the image they convey, their strengths and weaknesses, and secondly providing various courses of action to improve and maintain the competitiveness of the sector through innovation. Thirty-five valencian retail stores from different sectors (textile, food, habitat, etc.) took part in this study. One-minute-long videos simulating the entry and a short tour in their establishments were the selected stimulus. The sample of respondents was composed of thirty-two Valencian consumers with ages ranging from 25 to 50 years old. The experimentation took place in simulated conditions where the experience of the first approach to the establishment was reproduced. The questionnaires were designed according to Semantic Differential methodologies (Osgood et al, 1996), and to avoid order bias the sample was randomized. First, consumers were asked to rate shops according to a series of emotional terms after watching the video of their establishments and were asked for their opinion of buying or recommending the store. An emotional mapping of how Valencian retail stores are perceived was obtained. This was the basis for the elaboration of a semantic universe that showed which emotional terms were sufficiently stimulated by the current Valencian retail stores, and which emotional terms constituted a differentiation opportunity. The analysis of the results allowed the identification of the emotional factors that have an influence on the success of trade. In conclusion, the results obtained show the strength of the emotional engineering methodologies as a tool to collaborate in the design of an effective service differentiation strategy.

Keywords: Emotional perception, stimulus, Semantic Differential methodologies, emotional engineering, Intention of buying.Emotional perception, stimulus, Semantic Differential methodologies, emotional engineering, Intention of buying.

(422) Identifying Trigger Feeling Factors

AYAS Ebru Pinar, Royal Institute of Technology, Sweden

Trigger mechanism design in power hand tools is of great importance for communicating with the operator and for providing feedback on operational functioning. Therefore, for a successful power hand tool design, knowledge about how the trigger mechanism feels is required. This study aims to define and investigate the design factors related with trigger tactile feeling for electrical right angled nutrunners. A Kansei Engineering (Affective Engineering) study has been conducted for a comparison between users´ (operators that work at an automotive assembly plant) and product developers´ (product development group of a power hand tool manufacturer) to find common and differing semantic expression dimensions for that. 124 Kansei words (descriptors) were collected from literature, interviews and workshops. These words were reduced to 52 by affinity analysis and evaluated by operators and product developers using semantic differential technique. From the operator group`s responses six factors (explain 87% of the variation) were identified as, “professional performance”, “safety and tactile feeling”, “usability”, “smooth operation”, ”communication and durability”, “convenient and comfortable” to define trigger feeling. Correspondingly, five factors (explain 89% of the variation) “robust and appealing”, “ergonomics and operator performance”, “controllability and predictability”, “creativity and modern” and “powerful” were distinguished from the product development group. Results showed that the start phase and especially quick start of trigger mechanism is more important to operators, while end feedback is more important to product developers. Soft start of the trigger is correlated with ergonomics, optimal, clear operation and performance for product developers while soft start together with end feedback are associated with well-built, convenient and safe trigger characteristics for operators. According to the results from average ratings, the Kansei word “ergonomic” has been rated as the most important descriptor for trigger feeling together with “user-friendly”, “easy to use”, “long life time” and “comfortable” for both groups.

Keywords: Product development, semantic meaning, switch design, powered hand tools

(42) Designing a creative playground by Kansei Engineering Method

MOHAMMADPOUR Nazanin, University of Tehran, Iran
KHODADADEH Yassaman, University of Tehran, Iran
MOHAMMAD ESMAEIL Masoodeh, University of Tehran, Iran

This study is concerned with redesigning a playground with creativity considerations. One of the most important types of creative activities for children is playing. Playing and learning are very closely connected. Playgrounds are the common space for children to express their emotions and experience collaborative and creative games. At this moment, the available playgrounds in Iran are not equipped with creative games to satisfy children's creativity and learning needs. For this study Kansei Engineering method was used. Kansei Engineering is one of the useful methodologies that help the designers to provide users' emotional needs. Users' emotional needs have a great influence on their enjoyment of using products. Twenty five children, thirteen girls and twelve boys between 4 to 12 years old were selected randomly among the children in a playground. They were asked to describe their feelings about their favorite playground. In addition, twenty children were asked to draw paintings about their preferred playground. Sixty seven kansei words were collected. "Seven point scale rating" was used and kansei words were reduced to 30. Then Kansei Engineering was employed to design a creative playground, considering children emotional aspects. The final concept has been selected and was evaluated by Kansei method. In order to evaluate the children's satisfaction regarding the form, color and attractiveness of the final concept, another study was carried out with 25 children. Due to the satisfaction of these 25 children, it was concluded that the concept could meet the majority of emotional needs of them.

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Keywords: Creativity, Kansei Engineering, Emotion, Playground

(478) A Kansei Engineering Approach to Design A Scissors

KOLEINI MAMAGHANI Nasser, Iran University of Science And Technology, Iran
EBRAHIMI Sara, Iran University of Science And Technology, Iran

In today's business environments, where quality of a product is an essential part of design process, psychological needs for emotional satisfaction are growing. Kansei engineering, as a kind of human ergonomic technology refers to the translation of the psychological consumers feeling about a product related to perception in design. Kansei engineering sometimes referred to as emotional design. Since our study is an experimental study, the second level of emotional design (behavioral) was considered in Kansei engineering for designing scissors as a product. 32 Kansei words and 10 different types of scissors as samples for this study with the aspect of being in touch and variety in use were selected. A unique and standard paper cutting form that was sketched was used in tests, and participants must follow the path without break. 7-grade semantic differential method gathered in questionnaire. Each user had 10 of that and should fill it after working with each scissors and cutting that form. 36 university students had participated. Product details had been identified to finally connect to each adjective. Received data were analyzed and correlation coefficient of each couple adjectives was estimated. Kansei words classified in 13 clusters, and each cluster connected to related product details and design elements identified. Top scissors in each clusters were the same with a few replacements and that was a delicate scissors that may be selected because of delicate material and cutting the complicated path. Finally using the result of this study we present a new scissors designed.

Keywords: Product design, Kansei engineering, Scissors, Industrial design

(50) A Kansei Engineering study applied to hammers *with special attention to the selection of semantics*

VERGARA Margarita, Universitat Jaume I, Spain
SANCHO-BRU JoaquínLuis, Universitat Jaume I, Spain
MONDRAGÓN Salvador, Universitat Jaume I, Spain

Kansei Engineering is one of the forerunner methodologies which can help designers in designing products that provide a positive emotional response, and thus satisfying all the expectations required by the user. These techniques are being successfully applied in consumer product design (mobile phones, cars, printers, etc.), but they have been hardly applied to professional products. In this work a Kansei engineering study applied to hammers (which may be considered as professional products) with special attention in the selection of semantics is presented. Firstly, a methodology based on hierarchical cluster analysis is used to select the adjectives of a semantic differential test. This method allows to structure the semantics with different level of detail and to select the semantics with an almost objective criteria (i.e. not very dependent of the opinion of the test designer). After this selection of semantics, a Kansei engineering process, based on multivariate statistical techniques (factorial analysis and multivariate regression analysis), is used to study the relationships between the most important features of the hammers (shapes, sizes, colours, etc.) and the perception of the semantics. The regression models obtained for three representative semantics (Strong, Pleasant and Stylish) are presented and discussed.

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Keywords: Kansei Engineering, semantic differential, hierarchical cluster analysis, multiple regression, hand tools

(222) Investigating not only sensations but also emotions to increase visual comfort of car seats

HERBETH Nathalie, RENAULT SAS, France
BLUMENTHAL David, RENAULT SAS, France

Sensory testing focuses on explaining customers' preferences through the sensory properties of the products. Actually, knowing how much of each "ingredient" to put into the "recipe" is essential for New Product Development (NPD). However, in highly competitive markets like automotive industry, recent technological breakthroughs have leveled off the perceived differences between products. Consequently, advertisements have increasingly focused on the emotional benefits of products. Besides, it is now acknowledged that emotions influence satisfaction and may be a decisive factor in purchase decisions. Thus, understanding which characteristics of the products would elicit emotions is of a great importance for NPD. The purpose of this study is to test and evaluate a method to investigate customers' emotional perception related to cars. Renault has done a lot of work to understand and optimize its car seats' safety as well as static and dynamic comfort. Nevertheless, designers still miss data on visual perception of car seats, and more specifically on the visual perception of comfort. What are the characteristics of the car seat that will make it look comfortable to customers? Our study was designed to investigate the visual perception of car seats, and to understand which specific visual characteristics would elicit emotions, enhance the visual comfort and eventually make the seat appealing to customers. A test was conducted on fifteen car seats and a hundred French customers. A description of the approach used to develop the methodology and the main results of the study are presented.

Keywords: Car seats, Emotions, NPD, Visual Perception, Comfort

(390) Embedding Emotions within Automatically Generated Brand Names

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Brand names are everywhere and are more and more important due to the rate which new products are issued at. Names have been recognized to embed many characteristics of the products or company they are related to. For instance, names like “discipline” can invoke feelings like “unhappiness”. Moreover, brand names have been hardly studied from the linguistic point of view, although they are a very rich piece of language. They are indeed everywhere and are of a large set of various forms: they can be taken from a dictionary, or on the contrary be a neologism, which can be very far or very close to existing words. They can convey a meaning in one or several languages, or on the contrary be as original (even unpronounceable) as they cannot take any meaning shared by all the people/consumers. For this reason, the automatic generation of brand names is a very difficult task, which has not been given much attention yet. In this paper, we will describe our method and how emotions can be embedded within a name. Our method is based on a three-step process: - selection of a set of emotions and concepts, - creation of the names, - evaluation of the names. In the first step, the user specifies the emotions and connotations (s)he would like to embed in the brand names (s)he is currently creating. In the second step, we put together the concepts and emotions, and we add linguistic properties to choose letters that convey emotions and meanings. These letters have been intensively studied in many languages. For instance, in French, letters such as “k” convey the meaning of exoticism in French (as this letter is very rare in French), which is highly related to the emotion that the user will feel when seeing the brand name on a product. The third step is performed using cognitive psychology paradigms. The paradigms used allow an implicit evaluation and avoid desirability bias. Experiments are led on people to confirm/infirm unconsciously the feelings and emotions that were to be embedded in the name our method created. In this paper, we will detail these three steps and present the results of the experiments led.

Keywords: Brand Names, Emotions, Data Mining, Text Mining, Concepts, Linguistics, Psychology

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(26) The Investigation for Conceptual Design on Random Algorithm

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Intend to find a KE process for easily create ideas for concept design, select the front handle cover which is the most distinctive feature of motorscooter. Although this process could be more complicated than hand drawing, but it can immediately start and provide many ideas. And we can operate uncounted times to produce totally different ideas. The process can be concluded to 6 steps: 1) collect samples: took 80 samples from market, 2) define parameter: The forms of collected samples have to categorize in the Bézier curve which is composed of 8 coordinate points and 14 control points. 3) define dimension of parameter: all dimensions of parameters are defined in maximum boundary from 80 samples, 4) random selection: a set of parameter selects from randomizing data of parameter 5) rebuild concept design model: use VB 2006 to rebuild models from randomizing data. 6) Evaluation: evaluate rebuild models to judge for further process from professional designers. Therefore, we found out some concept designs beyond imagination, and can easily redesign for further one. From this method, we could develop originality design, and it is possible to develop a universal program to fit for any one after modulate dimension of parameters.

Keywords: Motorscooter, Random number routing, Conceptual design

(437) Bodily non-verbal interaction with virtual characters

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Humans use their bodies in a highly expressive way during conversation, and animated characters that lack this form of non-verbal expression can seem stiff and unemotional. An important aspect of non-verbal expression is that people respond to each other's behavior and are highly attuned to picking up this type of response. This interaction, of course, includes verbal conversation, but it also includes non-verbal interaction, the use of the body to convey a range of social and emotional cues that are both subtle and complex. These cues, including gestures, posture and movement style, are vital to face to face interaction. We propose that bodily non-verbal cues are a natural way of interaction with animated virtual characters. Characters should be able to detect non-verbal cues in the behaviour of a human and respond with appropriate cues of their own. These cues include gestures, posture and also other cues such as non-verbal aspects of speech (prosody). The cues used should be as close as possible to natural human cues that we use in our normal conversational interactions. This means that interfaces does not need to be learned, instead it is instinctive and often sub-conscious. If the character responds with sufficiently natural non-verbal cues then the human will respond to them naturally and subconsciously as if they were a real person. This creates a loop of non-verbal interaction that mimics real human interaction. However, automatically generating this type of behavior is difficult as it is highly complex and subtle. This is an example of the general problem that the interactive behavior of a character is normally generated procedurally based on programmed rules and algorithms. It is difficult to capture subtle nuances of behavior in this way. Data driven techniques that are used for animation capture very well the nuances of an actors performance. This paper applies data driven methods to creating characters capable of bodily non-verbal interaction. This involves both generating animated non-verbal behaviour in the character and also responding to the speech and gestures of a human. We propose a two-layer model that separates learning the response model from generating realistic animation, and so can ensure that optimal techniques are used for both. A dynamic bayesian network is used to learn how the character responds to speech and gesture interaction. This model is then used to drive a motion graph that generates the animation. It is possible to interact with the character using a microphone and a motion tracking interface. The character's movements and posture respond to emotional cues in the human's speech and movement.

Keywords: Animation, Body Tracking, Non-verbal communication

(258) Indigenous Products of Emotion

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This paper introduces the general framework of levels of product experienced by the indigenous people. Four distinct components are discussed in observing indigenous products: products as mediators to interaction, enhancers of social interaction, relating to identity and objects of emotion. These are crucial that involves the life context, engagement of the users with the product, experience that continually refers to product reliability, creating a pleasing experience and satisfaction can greatly influence the success of a product. The aim of this study is to examine the adaptability of an evaluation method using the visual images to evaluate the impression of an indigenous product design based on Kansei. Kansei approach was used to address the emotional side of product used by the indigenous people that satisfy basic functionality, usability and safety. In a design context, Kansei emphasized the designer's imagery skills: the power to produce a mental image and use this in the creative process. It is important to understand on how indigenous people used their creativity in designing products as each product portrays different form and shapes that had specific preferences. The quantitative feature values for indigenous products are collected and the relation between Kansei words and the visual feature of indigenous products are analyzed. A cluster analysis was carried out in order to determine the exact groups of products that fit to the user's needs. A number of clusters were emerged which are able to identify particular design features and its usability. This study also gives attention to the behaviors of users when they perceived the artifact and their preferences' or cultural bases work to their feelings. Results show that specific design used by the indigenous people basically based on user's environment, emotional values and the contexts of product used. The implications for the design are that emotion acts as an important component of indigenous artifact sense –making and determines how artifacts are interpreted. This create an affective artifact in many aspects such as the product's functions, characteristic, associated meanings on actual product use, and perceives pleasure.

Keywords: indigenous product, interaction, identity, emotion, kansei method

(379) Computational Methods for Shape Manipulation in Generation

A literature review

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In this paper we will present a state of the art of the descriptive and generative models for shape. We will present several different approaches for the manipulation of shape in computational systems : numerical models, graph models, descriptive models. This paper has been produced in the context of the GENIUS project. This project consists in the elaboration of a categorization and generation system for designers. Considering the design process, this system intends to support the generation phase (generation of solutions, sketches, identification of a "good shape"). In order to do so, several issues have to be adressed : the modelisation of the designers cognitive process, the elaboration of an artificial intelligence system that incorporated designers' knowledge, and the designing of an interface for letting the designers manipulate the system's data and results. In this context, we have particularly focused on a state of the art of the technologies that would let a computational system manipulate and compute shapes. This state of the art covers different technologies, starting with those to support information retrieval. In this context, we investigate 2D and 3D techniques that provide descriptors for image retrieval by shape. In a second part, we will detail technologies that are related to the numerical modelisation of shapes (such as parametric models, surface models, etc.). And in a third part, we will get through the generative models that let a computational system create new shapes and new composition of shapes. These technologies have been studied and discussed relatively to their capacity to fit with the designers' cognitive processes. More particularly, we discuss the fact that a composition of several models, and means of translation between these models, has to be achieved in order to cover the shape generation process from the very beginning (generation of random shapes) to the end (detailed sketching). In relation with our objectives – the elaboration of a creative shape generation system – we will propose perspectives of development for a combined model of shape taking into account several descriptors in order to support the shape generation phase in design.

Keywords: design, shape description, shape generation

(306) Product Shape and Emotional Design

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Shape features play a major role in the perception of designed objects. In this paper, we study the relationships between linguistic and numerical shape descriptions, focusing on real images of perfume bottles. The subjective linguistic evaluation of the bottles is obtained through expert annotations using emotional words as labels; the bjective numerical description relies on automatically extracted attributes such as elongation or circularity. Statistics and machine learning tools are exploited in order to learn a matching between shape descriptors and subjective labels.

Keywords: emotion detection, image processing, affective computing, machine learning

(117) Genetic Fuzzy Generation of Mass Perception in Non-Functional 3D Shapes

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When designers create new forms they integrate both quantitative objective elements and qualitative subjective elements. However, users will generally react to these forms without knowing the intended Kansei integrated into them by the designer. Human beings are doted with a complex brain structure and it is argued that human attributes originate from three different levels of the brain: the visceral level; the behavioral level and the reflective level. This paper focuses upon the visceral level of reaction by automatically building a link between geometric properties of non-functional 3D shapes and their perception by observers. The link between geometry and human perception is created using a genetic learning algorithm combined with a fuzzy logic decision support system. Human evaluations of the non-functional 3D shapes against two contrary perception adjectives (massive versus lightweight) are used as the learning data set. The non-functional 3D shapes were designed by engineering design students from the Technical University of Denmark who were asked to design non-functional 3D shapes evoking either the adjective massive or light. Eight fuzzy models were developed: three (3) models constructed manually by the author and five (5) genetically generated. The fuzzy models were constructed using different sets of inputs of quantitative geometric properties. Combination of the different inputs resulted in different sets of fuzzy rules that can eventually be used as design guidelines for designers. The results obtained and presented in this paper are very promising. Correlations as high as 99% between fuzzy and human perception were obtained along with errors as low as 0.14 on a scale ranging from -3 to 3.

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Keywords: Aesthetics, fuzzy logic, design characteristics, genetic algorithms, automatic learning

(63) Characterization of Emotional Descriptors for Human Body Shape Description Using Sensory Evaluation and Classification of Body Measurements

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In our everyday life, emotional descriptors such as “fat”, “slim” and “sportive” are usually used by general public and professional experts to describe human body shapes. In textile industry, a quantitative characterization of these emotional descriptors is very interesting for garment design. Based on these characterized emotional descriptors, we can more easily formalize the knowledge of garment designers and fashion designers on the relationship between body shapes and fabric materials and fashion styles of garments, and integrate this knowledge into a garment CAD system for proposing personalized products and suggestions to consumers. In this sense, the characterization of human body shapes is particularly significant for realizing mass customization, i.e. quickly designing and producing new personalized products with minimal cost. However, the characterization of emotional descriptors is rather difficult because it deals with a great deal of uncertainty and imprecision related to human perception and human expression. For people having different professional and cultural backgrounds and different sensitivity on body shapes, they generally give different results on evaluation of emotional descriptors. Also, emotional descriptors describing human bodies have never been normalized. A great number of synonyms can be used for describing similar semantics. The relationship between these synonyms should be studied in order to form more standard emotional descriptors. This paper presents a new method for characterizing emotional descriptors describing human body shapes using classification of body measurements. In order to generate different representative human body measurements, we create a set of virtual 3D human bodies with a CAD software. These virtual 3D human bodies can be used to simulate morphology of real body shapes from different angles. Next, for a specific application such as sport garments or professional suits, a procedure of sensory evaluation is organized so that a number of selected experts generate a list of relevant normalized emotional descriptors and then evaluate the virtual human bodies using these descriptors. From the body measurements taken from these virtual human bodies, we extract the most relevant geometric features for each normalized emotional descriptor. Based on the extracted features describing body shapes, we can effectively classify the virtual human bodies into several classes for each emotional descriptor and generate geometric criteria for a group of emotional descriptors by performing a data aggregation operation. Using the proposed method, a specific human body shape with a set of emotional descriptors can be realized by adjusting the corresponding geometric features or body measurements on the CAD software.

Keywords: body measurements, emotional descriptors, body shapes, sensory evaluation, fuzzy cognitive map, decision tree

(221) A study of Form Feature on Mega Motor Yachts

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The Manufacturing technique of Taiwan yacht industry has been kept pace with that of Europe and American for a long time, but nowadays the yacht industry is facing the problem of self-developed yacht entertainment industry along with shortage of yacht designers. Therefore, this research is based on the relationship of between emotion and actual form features. The objectives of this research is surrounded by three elements, which includes real form features, adjective images, as well as preference. As a result, the positive influence is derived from significant to insignificant, such as elegant, sporty, energetic and steady, and the negative influence¡Gcasual and tasted. When the hull length is longer, it comes to elegant, tasted, energetic and casual. When it comes to shorter, the outcome is steady and sporty. When the position of the hull comes to the middle, it brings to the feeling of elegant. When it comes to the stern, the result will present feeling of elegant. On the aspect of front window slope, it brings the tasted feeling when the angle goes big, and it brings the feeling of elegant and sporty when the angle is 45¢X, and it brings the feeling of energetic, steady and casual when the angle goes small. Regarding the aspect of FRP hard top, when the altitude goes bigger, it brings the feeling of elegant and casual, and lower brings the feeling of steady and tasted. When the length is longer, it brings the feeling of energetic, steady and casual. When it's shorter, it brings the feeling of tasted. On the basis of the FRP hard top angle, When the angle comes big, it will bring most of feelings. When the window shape looks like a pod, it brings the feeling of energetic and casual, the square goes to the feeling of steady, and parallelogram brings the feeling of elegant, sporty and tasted. Finally, the arrangement of windows follow the normal type brings the most feelings, and when it comes to the arrangement of two windows below and one window above and lean against to the right brings the feeling of steady.

Keywords: Form feature, Motor yacht, Kansei Engineering, Image, Conjoint analysis Layout instruction

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(242) Kansei Study on Paper

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Paper is commonly used in our daily life. It plays important roles in many aspects of life. However, there are only a few studies related to paper. Summers et al (2008) discussed about haptic discrimination of paper while Dinse (2008) studied the design of banknote and specially focused on the haptic design. However, no one has explored how the feeling of paper influences the emotion of people. Therefore, this study was to construct the perceptual image of printing paper. As there are numerous categories of paper, this study limits the scope to the most frequently used kinds of paper for printing industry. This study adopted Kansei Engineering to explore the relation between paper and the emotion of people. Total of three Kansei words and 27 paper samples were used in the experiment. Six participants were asked to measure the intensity level of feeling toward the 3 Kansei words for each sample during the experiments. The results showed that the higher degree of smoothness was, the less “Classically elegant” was felt. The higher degree of whiteness was, the more “Classically elegant” was felt. The higher degree of bulk was, the more “Classically elegant” was felt. The higher degree of whiteness was, the more “Fashionable” was felt. The higher degree of bulk was, the more “Leisure” was felt. The higher degree of whiteness was, the less “Leisure” was felt. The results of this study can serve as references to the paper industry and printing industry, as well as books designers.

Keywords: Kansei Engineering, paper

(248) A Relationship Between the Process of Light Changing and the Human Emotion Variation

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There are many researches to make plan of suitable lighting condition for comfortable life scene. It is necessary to change light plan for every life scene to apply it to actual life. If light changes in color, light and shade, etc, occurs without the consideration of human emotion, sufficient effects of next scene with planed light design, will not be able to obtained. In this paper, a relationship between the process of light changing and the human emotion variation is investigated and described. On the experiments 6 types of light stimuli such as Light and shade, Color taste, Focus, Angle, Height and Darkness are provided. The subjects operate the light stimuli by themselves and then reply their state of mind with Multiple Mood Scale (MMS). All subjects are have Japanese and aged 20 to 29 years old. Subjects are totally 20, 13 males and 7 females. The datas are analyzed with the multiple comparisons of Tukey's HSD test, principal component analysis and cluster analysis, as the results of the analysis, we conclude : 1) Color change can bring friendly and pleasurable emotion easily. 2) Focus, Height and Angles are relatively difficult to characterize from the emotional evaluation. 3) However, [Angle and Darkness] and [Light and Shade and Focus] can be the factors affect to change the emotion of Peace of Mind.

Keywords: Human Emotion, Process, lighting

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(531) Metrical Analysis of English Pamphlets Available at Local Airports in Japan

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Ishikawa Prefecture is located in the Hokuriku region in Japan. One of the main targets of the tourism industry in Ishikawa is to increase the number of tourists from foreign countries. In order to solve this problem, it is necessary to provide foreign tourists with a "language service." In this study, in order to understand the state of language service provided to foreign tourists, we investigated what linguistic characteristics can be found in English pamphlets at Komatsu Airport and Toyama Airport, which are local airports in Japan, comparing them with pamphlets available at Narita, Kansai, Central Japan, and London Heathrow international airports. In short, frequency characteristics of character- and word-appearance were investigated using a program written in C++. These characteristics were approximated by an exponential function. Furthermore, we calculated the percentage of Japanese junior high school required vocabulary and American basic vocabulary to obtain the difficulty-level as well as the K-characteristic of each material. As a result, it was clearly shown that English pamphlets available at local airports in Japan have a similar tendency to literary writings in the characteristics of character-appearance. Besides, the values of the K-characteristic for the pamphlets are high, and the difficulty level is also high, especially in terms of the Japanese required vocabulary.

Keywords: Metrical linguistics, Statistical analysis, Tourism

(211) Evaluate Attractiveness Factors of Taiwan Lantern Festival

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The purpose of this research is to establish evaluation model for festival of creative culture industry. The most representative case of Taiwan Lantern Festival is selected as the example. There are three steps to approach. 1) To find the attractive factors of the hierarchical grid diagram of 16 participants?preferences are made by the Evaluation Grid Method. 2) Based on ahead, the questionnaire were designed and investigated, 383 effective samples were collected. 3) To analyze the results by Quantification Theory Type I. The results are found 5 factors as original attractive items, 29 factors as abstract reason, 34 factors as concrete object. The attractiveness evaluation is discussed. This model could find and evaluate the attractiveness of festival more effectively, that should serve as a specific reference for product designer, management, planning and tourism of festivals activities.

Keywords: Creative industry, Taiwan Lantern Festival, attractiveness factors, repeater, evaluation.

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(267) Preference-Based Analysis of Black Plastic Frame Glasses

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Since the innovation of plastic, it has become a popular material for the frames of eyeglasses. Among them, black plastic is a classic type which has been very popular from the beginning. Black plastic has even been connected to fashion symbols. It would become a fashion once a few years. Celebrities in many countries wear black plastics eyeglasses in their private times, especially in Taiwan. There are about 70% consumers choose to wear black plastic glasses in Taiwan. Why the black plastic could become a fashion again and again? The main purpose of this study was to find out the charm factors of the black plastic glasses, and the different point of view between the users and non-users. In this study, the definition of black plastic glasses was defined in the beginning. Based on this definition, forty-eight pictures of black plastic eyeglasses had been selected. Eight people sensitive to black plastic were invited to do the interview. Then, a relation model of the charm factors was built by expert group meeting (EGM) method. Via questionnaire, 60 users and 60 non-users showed their opinions on the charm factors. Then the data of experiment were analyzed by Quantification Theory Type I. This study offered designers the different points of view of users and non-users of the black plastic glasses. Designers can apply the results to design black plastic glasses for different markets as well as to design similar products.

Keywords: Kansei Engineering, Black Plastics Eyeglasses, EGM, Quantification Theory Type I

(319) Three Levels of Product Emotion

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This paper introduces an approach to emotion driven design that was based on the process that underlies emotional responses to consumer products. Three levels, and nine associated classes of product-evoked emotions are discussed, which are each the outcome of a unique pattern of eliciting conditions. The approach is based on two main propositions. The first is that all emotional reactions result from an appraisal process in which the individual appraises the product as (potentially) harming or favoring his or her wellbeing. This appraisal is a non-rational sense-evaluation of the product's relational meaning. In this perspective, the appraisal is considered a key-parameter that determines if a product evokes an emotion, and if so, what emotion is evoked. Three main appraisal types are identified: an usefulness appraisal, a pleasantness appraisal, and a rightfulness appraisal. The second proposition is that products can generate at least three classes of emotional stimuli: stimuli with a product-focus (i.e. the qualities and properties of the product); with an activity-focus (i.e. when using the product), and with a self-focus (i.e. consequences of using the product). The three appraisals and three levels of person-product relationships combine to a framework of nine sources of product emotions. The framework is used as the basis for an approach to design that aims for three levels of emotional product appeal.

Keywords: Emotion, Design Psychology, Design Theory, Appraisal

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(158) Can we design pleasurable products by combining pleasurable sensory properties?

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Sensory pleasure is an important component of product experience. Designing pleasurable products can enrich user satisfaction and contribute to the well-being of people and society. In this study we are wondering how sensory properties of products contribute to a pleasurable product experience. We manipulated stimuli of two sensory modalities and determined the correspondence between the pleasantness of these sensory properties and the pleasantness of products in which the two sensory properties were combined. In the first study we used colors and smells that differed in freshness. We designed products (softdrinks and dishwashing liquids) using fresh and non-fresh stimuli (colors and smells) in four different combinations and asked respondents how fresh and pleasant they find each product. In the second study, we designed alarm clocks and whistle kettles using noisy and calm stimuli (sounds and visual patterns) in four different combinations, and asked respondents how noisy and annoying they find each product. The correlations between noisiness and annoyance were found both for single stimuli and for the final products. However, the correlations between freshness and pleasantness were found only for single stimuli. There were no such correlations for the final products. Apparently, the combination of two pleasant stimuli does not guarantee the pleasantness of the final product.

Keywords: sensory product experience, pleasantness, freshness, noisiness

(198) The experience of non-functional touch

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Consider the physical interaction between a person and a pen. Very likely you will think of somebody writing with the pen. But people interact in many more ways with the pen than while writing. People swing or roll the pen between their fingers, continuously click the mechanism to pull the tip of the pen in or out, tap with the pen on the table, chew on the back of the pen, develop amazing tricks with the pen, and so on. These interactions can be characterized as non-functional touch: they are not related to the functional use of the pen. These - often repetitive - interactions occur absent-mindedly: the body seems to long for these kind of interactions while the user is unaware of it. But they are very present. Also, more than once, they irritate the environment, and elicit remarks such as: “Can you please stop that clicking!”. These non-functional interactions with objects are frequent and familiar and can therefore be considered as being meaningful to users. Yet they do not seem to be part of the considerations of designers when designing products. This paper addresses the experience of these non-functional physical interactions: why do people interact with objects just for the sake of the interaction? What kind of movements are made? What tactual properties of objects elicit these kind of interactions? And why should product designers care about these aspects of human-product interaction? During the elective course Tactility design students explore these non-functional interactions with objects. They observe their own non-functional behavior, analyze these experiences and design objects with the mere function to satisfy these non-functional needs. The results of the design exercise show that students are able to discover their own characteristic non-functional behavior. They come to class with the objects they found that suit best their needs to touch and declare: ‘I’m a real swinger’ or ‘I’m a real stroker’. Other stereotypes are clickers, scratchers, builders, destroyers, folders, tappers, and so on. Moreover, a specific stereotype movement seems to fulfill a specific need: for example to calm somebody, to enhance concentration, to stimulate day-dreaming, to pass time while waiting, to give support in socially awkward situations, and so on. Analysis of the reported experiences show that the interactions fulfilling these specific needs are very specific. For example continuous, fluent movements are calming, while staccato, short and repetitive movements enhance concentration. The objects that elicit these movements can be characterized by their size (for example organic and solid versus long and flexible), the way they are balanced (well balanced or out of balance), their texture (smooth or with specific patterns), and so on. The students design objects that embody these characteristics and thus elicit the specific movements. These objects are brought to class and possible applications in existing functional products are discussed. For example, mobile phones that enhance stress relieve, car-keys that enhance concentration, and so on. The results of this design exercise show that designers should be aware of these non-functional aspects of physical interaction, because they address basic affective human needs.

Keywords: tactual experience, affective design, designing for physical pleasure

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(327) Emotions in Tangible User-Product Interaction
A Psychological Review

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Man-product interactions traditionally involve tangibility to a large degree (cf. buttons, handles, steering wheels). In the digital product domain, the amount of tangible interaction devices is growing since a decade (cf. iPhone, Wii, Hitachi's "Force"). The user's bodily motor behavior is at the core of tangible interaction. This paper will show that the user's emotions are closely connected to her motor behavior. This paper aims to give a theoretical start to investigate the possibilities of integrating the user's emotional bodily motor movements in interaction design. It will give a compact psychological overview on the user's emotions and her motor behavior within a product interaction context. First, the expression of emotions by motor movements will be outlined - using appraisal theory. Second, it will be shown that a user can be cued to attribute specific emotions to products – using attribution theory. Finally, embodied cognition and body-feedback theory will show how products and interactions can elicit specific user emotions. The paper will conclude with the future applications and research aims with regard to affective product interaction.

Keywords: emotion, tangibility, interaction, attribution, body feedback.

(18) Finite Element analysis to investigate sleeping comfort of mattress

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There have many studies to investigate the sleeping comfort of mattresses using sensory tests and body pressure distribution. Measurement of stress distribution within the human body would provide valuable information, however, this measurement involves an invasive test and stress on the subject which prohibits this approach. Therefore, a numerical analysis is considered to be one of the most desirable techniques to estimate stress distribution within the human body. In this study, a two-dimensional human body-mattress model was developed, using a Finite Element method to examine the sleeping comfort of mattresses. We constructed a male and a female Finite Element models based on the statistical data of average Japanese human body dimensions. Each human model consists of bones, ligaments, intervertebral discs, and soft tissues. A mattress model was treated as a homogeneous one-layered structure. Bones, ligaments, and discs were assumed to be linear elastic and material properties of each component were obtained from the literature. Material properties of the human soft tissues and mattress were hypothesized to be hyperelastic. In order to simulate a sleeping state lying on mattress, contact elements were incorporated between human body and mattress, and gravity was applied. We utilized von Mises stress as an evaluation criterion of sleeping comfort. If stress distribution of the human soft tissues in the lumbar region is low, sleeping comfort is presumed to be appropriate. In order to investigate the mattress firmness that yields the lowest stress in the lumbar region, we performed the Finite Element analysis iteratively while modifying Young's moduli of mattress after Young's moduli of soft tissues, which were set from 0.1MPa to 1.0MPa. The Finite Element analysis package ANSYS was used in this study. When Young's moduli were comparatively higher (firmer mattress) or lower (softer mattress), the von Mises stresses in the lumbar region were larger. However, when Young's modulus of mattress was neither high nor low (medium-firm mattress), the lowest stress in the lumbar region resulted, and sleeping comfort was regarded to be most suitable. As a result of the iterative Finite Element analysis, the characteristic of mattress firmness generated the lowest stress within the human body was found to be different between the male model and the female model. Subjective preference of mattress firmness is assumed to be determined according to body type or body dimensions and material properties of the human soft tissues. The Finite Element analysis is considered to be one of the best tools to study sleeping comfort.

Keywords: Finite Element analysis, Sleeping comfort, Human body dimensions, Mattress

(62) A dynamic design of experiments using intelligent techniques in sensory evaluation

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Sensory evaluation techniques have been widely used in many industrial fields, such as food, cosmetic, automobile and textile. In an enterprise, sensorial evaluation can be mainly used for product quality inspection, development of human oriented product design criteria, normalized communication inside the enterprise and with its partners, and identification of consumer's behavior and market exploitation. In a sensory evaluation, evaluators determine the quality level of each sample according to the results of comparison between any two samples (tests). In practice, the evaluation order of samples is not optimized and the cost of evaluation, strongly related to the number of tests, is rather high. The existing designs of experiments in sensory evaluation are mostly static and offline methods, in which evaluation orders of new samples can not be adjusted by current evaluation results. For evaluating n samples, we need to perform about n(n-1)/2 tests. Therefore, we need to optimize this evaluation order (design of experiments) by developing a heuristic strategy so that the number of tests can be largely reduced while the evaluation precision is not changed significantly. The method we propose in this paper permits to combine the nearest case inference and IOWA aggregation operator in order to realize a dynamic design of experiments for sensory evaluation. This is an online design of experiments in which new samples are iteratively generated from evaluation results of old samples. Two main ideas of this method are given as follows. 1) For the samples already evaluated, we define a partial order between them according to the similarity degree. For any two samples, the similarity degree is calculated according to the perception of evaluators, which give not only the order between these two samples but also the linguistic distance between them (very far, far, medium, close, and very close). These similarity degrees can be used to construct OWA operation rules. 2) For a new sample, we look for its right place in the list of already evaluated and ordered samples. This procedure is carried out by estimating its similarity degree with existing samples. The contrast rule and the principle of OWA operator are both used in this estimation in order to quickly find the old sample the closest to the new sample. This iterative procedure permits to quickly define the order for all the samples by maintaining the accuracy of evaluation.

Keywords: sensory evaluation, online design of experiments, similarity degree, linguistic distance

(297) Stimulating consumers' affective mindset when implementing human appraisal surveys

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Products developers frequently check the performance of their products with the help of quantitative market research companies who usually propose the implementation of hedonic blind tests with large consumer panels. However, this approach is often criticized for the lack of commitment of the participants during the test and the artificiality of the hedonic response. In addition to this, the testing conditions are usually very different from natural usage situations and do not allow the respondents to be emotionally involved as they might be in real life, while making them often consider aspects they would never take into account when using the product normally. Hence, there is every chance that by inducing an analytical attitude in the subjects, these testing conditions will bring about artificial responses. The purpose of our work is to improve the way these tests can be implemented, especially when they are to be set up under controlled settings. Several options, besides modifying the physical context in which the products are tested were experimented. In a first experiment achieved with 244 women, we tested whether an authenticity test could also be used as an alternative to a traditional hedonic test when evaluating two brands of salted crackers. The principle is to induce a critical affectively negative attitude in the participants. This is achieved by telling them prior to the evaluation that the firm can raise its profit by making low-cost versions of their favourite product while selling it at the same price. The participants were then asked to say whether each presented sample (6 repetitions of each product) was a genuine one or a copy. Results of the authenticity method show that overall authenticity responses are closely linked to preferences but are more discriminant. Besides, the paired authenticity/preference data provide insightful information on the diversity in consumer perception. In a second experiment, we tested the possibility to induce contextualized responses by simulating context with short audio scenarios. In this study, we measured the appropriateness of a series of six imaginary eating situations for each tested product. Only one scenario allowed us to reveal a significant preference. This reveals that such type of technique may be successfully implemented but needs careful preparation and prior understanding of consumers' eating habits.

Keywords: hedonic testing, context, commitment, authenticity, scenarios

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(393) Developing Sensory Function: Transfer Human Senses from Contextual Perception

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Approaches in interaction design were explored a hyperspace that human cognitive actions and interactive system in both two end. Recently, this dualism in diverse direction is integrated in a notion of context, which had brought from social science as the manifest of implicit interactions that makes “sense” from human actions or activities. In this research, we applied perception in ecological view to capture the stimuli of context in its dynamic nature, and proposed a notion of sensory function in extracting the transfer character of sensorimotor as transmitting signals to perception. Firstly, a theoretical approach in integrated context and perception was reviewed as the nature of stimuli and sensorimotor that can offer a grounded knowledge to carry images of context to perceptual actions. Secondly, we practiced a process in conductive way to analysis and synthesis the transfer function as a notion of sensory function. Thirdly, an application of prototype was built for order action that situated in a coffee shop, and implemented with a concept of “waiter cup”. To conclude, this study may be important to support incentive observation at the early design stage, and provides a tool to exploring contextual perception in designing interaction.

Keywords: Interaction Design, Sensory Functions and Contextual Perception

KEER

(244) A Kansei Analysis of the Streetscape in Kyoto

An Application of the Kansei Structure Visualization Technique

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In city planning, a clear and comprehensive image or impressions of the entire region is a fundamental requirement. It is therefore required to consider not only the impression of a city but the impressions of regions and streets constituting the city. Considering these impressions at the same time is however difficult using the conventional Kansei engineering approaches. For this problem, the present authors have proposed the Kansei structure visualization technique. This study applies the technique to the city of Kyoto, Japan's old capital. The visualization clarifies the distribution and intensity of the impressions existing in the city. It also illustrates the difference between the impression of Kyoto and the impressions of each location in Kyoto. First, Kansei evaluation experiments are conducted to investigate the impressions of streetscapes in Kyoto. Based on the results of the evaluation, Kansei scores are allocated for each location in the city. The visualization process illustrates the scores using colours and their brightness. The visualization results are overlaid onto Google Maps. The results demonstrate that the visualizations enable users to understand the features of the impressions existing in the city easily. Also, it would be a useful tool to determine the locations where streetscapes need to be repaired.

Keywords: visualization, Kansei evaluation, impression of city, Kyoto, streetscape

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(249) A Proposal of the Kansei Structure Visualization Technique for Product Design

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In the process of product design, understanding just only the impression of a whole design target, but the features of locally existing impressions in the design is an important issue. Considering these impressions at the same time is however difficult using the conventional Kansei engineering approaches. This paper proposes a novel visualization technique, called Kansei structure visualization technique. The visualization clarifies the distribution and intensity of the impressions existing in a single design. It also illustrates the difference between the impression of a whole design and the impressions of each location in the design. As the first phase of the visualization procedure, Kansei evaluation experiments are conducted to investigate the impressions existing in a design target. Based on the results of the evaluation, Kansei scores are allocated for each location in the target. The visualization phase illustrates the scores using colours and their density. The visualization results are finally overlaid on a picture of the target design. This paper also introduces two visualization simulations for an automobile design as an example. The simulations demonstrate that the visualization is useful to determine the locations where design elements need to be repaired. The proposed technique will be an effective decision making tool to improve existing design plans.

Keywords: visualization, impression, Kansei evaluation, product design

(187) D'ou venons nous? Que sommes nous? Ou allons nous ?

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In this paper we make the case for new ideas and for a different educational approach/ practice. We explain why society no longer offers us fulfillment of our mental, social and material security. The lack of solutions for the complexities of the modern world – environmental issues, cultural clashes, the breakdown of cultures...- indicates that Western society touches on the limits of positivism and rational thinking. We fell into the trap of procedures without content. How to make young designers sensible to content and context as a counterweight to the damage, caused by rational thinking? How to make them aware of the fact that design is not value neutral? Cognitive methodology and rational working processes form part of our heritage. We are on the verge of a new era as alternative to cultural standardization and the postmodern hype of styles, subcultures and social status. We no longer can ignore the poetic, emotional and emphatic impact of cultural values as a new language joining people and not dividing them. Instead of displaying one and the same mobile phone all over the world, connected to the same user code, we should look after diversification in behavior and use. This switch in mentality makes up for a new quality in design interaction, with a different set of ethical and aesthetic values as framework: dealing with a 'language of making/ design through action' might break down the barriers between people, ideologies and even communities. In this paper we explore recent design experiences as reflection upon culturally embedded aesthetical and ethical values and their relevance on the language of dynamic form. We do not look for products as a final stage nor for particular functional meaning or reference. This paper argues that reflection on the process in action opens up new ways/revenues of communication, next to talking, to bridge interculturality. Working and reflecting together enhances mutual respect and appreciation as a basic attitude to socio-cultural dialogue and understanding.

Keywords: cultural values, ethical values, dynamic form, design interaction

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(501) Le Corbusier's Kansei of 'Wall'
The Journey and the Architectural Concept by the Modern Architect

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The purpose of this paper is to consider the process that Kansei (sensibility) of 'Wall' on Le Corbusier's journey is converted into the modern architectural concept from the viewpoint of Kansei-philosophy. We analyze Le Corbusier's descriptions extracted from Le Corbusier's records of the journey Voyage d'Orient Carnets (1911) and Le Voyage d'Orient (1965), and his work collection Le Corbusier&Pierre Jeanneret Œuvres complètes, vols.8. We can extract 5 non-modern themes of 'wall' ('Material', 'Opening', 'Color', 'Ornament' and 'Light'), and that Le Corbusier modernizes these 4 themes except 'ornament' in the earlier stage of his architectural activity, and afterwards, he transforms them into ambiguous (modern and non-modern) concepts. On the other hand, Le Corbusier makes 'ornament' to the theory in the later stage of his activity. We can say that the memory of Le Corbusier's hand in journey is not simply referred and quoted, or rather than being forgotten, the Kansei of journey is converted into the Kansei of architectural creation beyond his intention.

Keywords: Architectural KANSEI, Le Corbusier, Voyage d'Orient, Wall, Architectural Concept

(44) Emotions & fonts

Constructing emotional map of Chinese fonts

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Words are tool that convey not only information but also emotions. A beautiful story can always catch our feeling: we cry, we laugh; we are nervous, and sometimes angry. However, it always happens: we feel different when reading in different fonts. Using the right fonts at the right time is also important nevertheless may easily ignored. This study focused on the relationships and mechanism between Chinese fonts and emotional adjectives. For purpose, night subjects were asked to give points to 74 font samples in 9-level Likert scale with eight adjectives. The eight adjectives¡Xjoy, sadness, trust, disgust, fear, anger, surprise, and anticipation¡Xwere chosen for its polarity of emotions, from the Theory of Emotions, proposed by Plutchik. With the collecting data, factor analysis was applied to extract important elements. Consequently, two extracted components were 'Mental Congruity' and 'Mental Pressure'. The results show that (1) Archaic fonts bring more fear and sadness due to higher mental pressure; however modern fonts with more joy and surprise, because of lower pressures; (2) common fonts are more acceptable and anticipated for higher mentally congruous, contrarily, uncommon ones get easy to be disgusted and surprised with its mentally incongruity. On the other hand, fonts were scored in both elements, hence a map of emotions and fonts were constructed. The result is significant and can be applied for publishers to manipulate the emotions in story books, novels, or even comic books by degree.

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Keywords: Chinese fonts, Emotions, Emotional map

(381) Acting on Intellectual Systems of an Intervening Condition and Beyond Constrained Limits

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Intellectual systems of problem solving often transcend disciplinary lines. That is fortunate because cross-disciplinary insights enable us to (i) be instructed by lessons outside our domain and (ii) acquire means to articulate our own/chosen models. Our domain of practices becomes enriched. Radding and Clark (1992) argued that the 11th and 12th centuries were critical in discipline formation for master-scholars and builders. Our interest falls upon certain formative intellectual systems they highlighted: Masters in both evolving disciplines paid attention and reacted to the works of other masters, this compelling deeper insight and innovation. They also learned to hold one idea in mind/vision while resolving other issues. Results were more sophisticated problem definition and solutions. This author suggests that conjoint attitudes were necessary for the intellectual systems employed to take place. Such attitudes are embedded in recognition of necessity of creating intellectual space to examine other-than-own ideas and recognition that complexity and multi-valency are pragmatic, existential conditions. Attitude is endogenous to engaging practices. A designer's attitude towards paradigms of problem solving may facilitate appropriation of those paradigms as own intellectual systems. The author draws briefly on certain mechanisms of solution generation to structure an argument about the necessarily pervious limits of solutions. Recognition of that facilitates disposition in favor of exploration. In the final analysis, the objective is to compel the question of how possibilities of our intellectual engagement with phenomena we are investigating may be expanded in order to capture the range and evolutionary potentials of those phenomena.

Keywords: intellectual system, attitude, impulse, multi-disciplinarity

(73) Basic Study for Structuring Tourism Model Based on Sensitivity Values

A Case Study of Oguni Town, Kumamoto Prefecture

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In Oguni Town, Kumamoto-ken, there are attempts to structure 'New Business Model' for establishing 'Tourism' by offering 'New Experience Programs' to urbanites. To prepare the basic data to deploy ideas for structuring New Business Models, we focused on sensitivity values of recognition and evaluation of tourism in Oguni, and studied the domain of 'HOW' to offer 'WHAT' to 'WHOM'. To determine 'WHOM', we conducted questionnaire interviews and used the evaluation grid method of 30 people from nearby Fukuoka-ken whom we assumed as typical tourists visiting Oguni. Questions were related to 'hot springs', 'waterfalls' and 'Japanese-style inns', and 'how one spends time at travel destinations'. To examine 'WHAT', we conducted hearings of local business people and tourist organizers to extract resources useful to encourage tourists to visit Oguni. We conducted another hearing of transportation businesses to probe the current tourism trends. We conducted a questionnaire survey and hearing of tourists visiting Oguni to define its source of attractions. As for 'HOW', we collected materials related to 'experience programs' of other areas of Japan, sampled and sorted methods of retrieval on home pages, methods of program classifications, and points contrived. We then proposed three guidelines for the experience programs.

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Keywords: Sensitivity Values, Tourism Model, Evaluation Grid Method, SWOT Analysis, Design Strategy

(179) The Role and Efficacy of Kansei Assessment for Public Space Design

A Case Study of Chinese, Korean and Japanese Railroad Stations

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Because public spaces are used by people with diverse physical characteristics and cultural backgrounds, it has been customary for many years to pay attention to the safety, accessibility and usability of their design. We agree about the importance of these considerations. However, we believe that it is also important that aesthetics and the raison d'etre are emphasized in order that the large numbers of the general public who use these public spaces will find them appealing and view them as significant and meaningful. This paper is a subjective survey that examines railroad stations in China (Shanghai City and Nanjing City), South Korea (Busan City), and Japan (Fukuoka City), asking how users view the space of each station from the multiple perspectives of usability, aesthetics and raison d'etre. The results were analyzed on the basis of the different viewpoints of people according to their different countries and the differences according to different sites. Our results show that South Koreans and Japanese have different viewpoints about the same station relatively often and that, despite the common function of railroad stations, spatial differences are influential.

Keywords: Public Space Design, Evaluation, Station, East Asia

(217) A Method of Transforming Implicit Knowledge into Explicit Knowledge to Actualize Self-Practice of Kyogen Movement by Utilizing IT

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This paper will report on the formalization of implicit knowledge in order to aid self-practice of Kyogen movements by utilizing IT. The formalization of implicit knowledge was done by introducing Furicho system which was already being used in Japanese dance, Buyo. By implicit knowledge we mean that knowledge which cannot be taught using textbooks. It is taught to students (disciples) by Masters through using words and movements. Sensory teaching can also be seen. Kyogen traditionally uses this teaching style. On the other hand, explicit knowledge is knowledge taught by using various forms of media (e.g. video and print). The Furicho method is a good example of this. Information on the different parts of the body was collected as digital data by recording Kyogen movements and techniques using motion capture software. Using the data, a Kyogen Furicho was created by using the templates that were forms of Kyogen Komai (Kyogen dance). This Kyogen Furicho was adapted for use in software.

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Keywords: Motion Capture, Kyogen, Implicit Knowledge, Furicho.

(181) A Comparative Study on the Ideology and Methodology of Contemporary Architects in China and Japan in Search of Unique Kansei Traits

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Architecture in Japan and China has been strongly influenced by western architecture since the 20th century. However, under the influence of western architecture and the internationalization of architectural style, architecture in both countries started losing cultural originality. This created a significant conflict in the Chinese and Japanese architectural worlds. This led to a movement by contemporary architects to seek originality without rejecting western style architecture since the 1970's in Japan and 1980's in China. The main purpose of this study was to indentify the unique Kansei traits, and how this knowledge can be used to promote a better understanding of the influences that promotes original architecture. The historical background of contemporary architecture in China and Japan, along with the similarities, and the differences pertaining to the solution on how to express Kansei in China and Japan were examined. Architecture by three Chinese (Taining Cheng, Zhenyu Cai, and Jinqiu Zhang) and three Japanese (Kiyonori Kikutake, Arata Isozaki, Kisyo Kurokawa) contemporary designers were chosen in this comparative case study to provide concrete subjects to reveal the unique ideology and methodology behind the Kansei in these two countries. These architects represent transitional periods from the 1970s in Japan, and the 1980's in China, and provide valuable insight into the solution sought in this paper through their attempts to discover an effective approach to make original architecture without conflict. This study brings out the commonality that exists for the very traditional and original Kansei ideologies of Kyo-Sei, Tsyo-Wa,and Tian Ren He Yi. Kyo-Sei reflects the symbiosis-fusion for even opposing factors or inconsistencies. Tsyo-Wa refers to the harmony existing together without conflict. Tian Ren He Yi represents the harmonies between people and all objects. The results show that there is a difference between Chinese and Japanese architects' perception of time and space. Chinese architects consider time to be a part of all aspects of nature. Therefore, time and space are indivisible; integrated like the rhythm of music. Time flows, but is also like a single photo or frame in a movie, and the Chinese try to capture this "moment". However, Japanese architects consider time and the environment as parallel. Time is independent, and has a definite beginning and end. Chinese architects consider space as an abstract spirit or image. Space can be a part of the architecture, but it is more than just a physical state, it takes on the soul of architecture. Japanese architects consider it as an element, which is physical and functional. Kyo-Sei, Tsyo-Wa, and Tian Ren He Yi became the "source" of Kansei of the six architects introduced in this paper. The differences between China and Japan about time and space are based on this "source". Comprehending this sensibility is an essential part of seeking the originality of architecture to create contemporary architecture in harmony with traditional Kansei elements.

Keywords: Unique Kansei Traits, Japan, China, Ideology, Contemporary Architects

(156) Effects of Skin Lotion Perfume on Building *An Attachement for the lotion during continuous use*

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The regular use of skin lotions helps realize their value, and the user may display a preference for such lotions thus encouraging their repeated purchase. Our previous studies indicated that the regular use of a skin lotion makes users aware of its effects and improves their impressions of it. Further, these studies demonstrated that the users tended to prefer a lotion especially in consideration of its moisture, penetration, and scent. Therefore, in this study, we have focused on the scent of lotions and, through three experiments, have tried to demonstrate how it influences the preference for a particular lotion. Twenty young women who frequently used skin lotions participated in the three experiments. Four lotions comprising the same ingredients, but having different scents, were presented as stimuli. The selected scents were fruity, luxury, strong, and rose, the most popular scents in the market. In Experiment 1, the participants applied the four different lotions and then subjectively evaluated them on the basis of scent, comfort, and their impressions of the lotions. They then ranked the four lotions in the order of scent, comfort, and their willingness to use them again. In Experiment 2, each participant used her preferred lotion selected in Experiment 1 for two weeks and evaluated it every day. The same evaluation criteria as those in Experiment 1 were employed for this purpose. After two weeks, Experiment 3 was carried out in the same manner as described in Experiment 1. In addition, the participants were interviewed on how their first impression of the lotion and its scent changed with regular use and how they began to prefer that particular lotion. The results showed that the scent of the lotions influenced, to a great extent, the participants' evaluations of their feel, functional effects, and psychological effects. Although all the skin lotions comprised the same ingredients, the participants believed that they were different. Moreover, during the two-week use of their selected lotion, their impression of its scent changed and as a result, they subsequently began to display a preference for that particular lotion. In addition, it was observed that if the participants disliked the scent, they tended to negatively evaluate the lotion and did not display any preference for it. On the other hand, the participants who began to like the scent of the lotions were more inclined to like the lotions as well. Moreover, the participants who were sure of the effects of a particular lotion were easily able to adapt to its scent and displayed preference for it. These results revealed that the evaluation of the scent affected the evaluations of the lotions. The preference for a specific lotion involves several factors and differs from person to person. Therefore, it is essential that further investigations be conducted to examine such preferences, and their results be applied to help consumers select the most appropriate lotion at a store.

Keywords: cosmetic, attachment, perfume, long-term use

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(178) Research on the construction of kansei design education programs and design evaluation and diagnostic systems

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The goals of Kyushu University User Science Institute (USI) is to generate true enjoyment by promoting a synergy between kansei and technology gained from the viewpoints of a wide range of users, and develop unconventional R&D systems to design the creation of knowledge, and to establish educational systems to cultivate human resources to support these systems, as well as build the world's first education and R&D center for user science. Starting from kansei, USI intends to fuse a wide range of study/research domains, including design, engineering, medicine, agriculture, and human and environmental studies. As such, USI is moving ahead with the development of the "Kansei Table," which is the backbone of the system for the fusion, and the "Quality Karte(Quality Chart)," a design evaluation diagnostic system. This paper outlines our approach to the Kansei Tabl, and explains the details of the role and benefits of the Quality Karte(Quality Chart) development including its development process. The Quality Karte(Quality Chart) is an evaluation tool for the Kansei Table. It sorts users into three groups: consignors, such as managers and salespersons, designers, such as designers and engineers, and receivers, such as end-users. By having all users use the same evaluation indicators, it clarifies the gaps that appear in design evaluation findings, which are thought to exist between all user groups when products and spaces are evaluated. The gaps are in the kansei aspects of user needs, and the objective of the Quality Karte(Quality Chart) is to make use of the gap factors in design development.

Keywords: Humanization of Technology, Kansei design, Design Evaluation, Kansei Value Creation

(533) Influences of Straight Line Expression Elements in Abstract Paintings on Impression Evaluation and Eye Movement

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This paper has the purpose to inspect differences regarding impression evaluation and eye movement by comparing straight line expression elements in abstract paintings. Malewitsch s paintings which emphasize oblique lines and inclined rectangles elicited impression evaluations such as 'hard', 'irritable', 'dynamic' and 'exciting'. Mondrian's paintings which emphasize vertical line and horizontal line elicited impression evaluations such as 'cheerful' and 'light'. Paintings which emphasize oblique lines and inclined rectangles elicited high frequency of long gaze. Paintings which emphasize vertical line and horizontal line elicited fast mean gazing speed. Paintings which do not emphasize boundaries elicited slow mean gazing speed. From this study result, it was indicated that vertical, horizontal, and oblique lines in abstract paintings were influencing factors for impression evaluation and eye movement. This study is inspection of common impression and perception caused by looking at paintings.

Keywords: Straight Line Expression Elements, Impression Evaluation, Eye Movement

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(185) Sleeping Comfort Evaluation of Bed Mattresses Based on Polysomnography (PSG) and Motion Analysis During Sleep

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The purpose of this study is to create an evaluation index for the quality of sleep according to the elastic properties of bed mattresses, by measuring physiological and psychological responses and the motion of turning over in bed while sleeping. Four different bed mattresses with different elasticity moduli were used. All of the mattresses featured a pocket coil system. In order to monitor the depth of sleep – an important indicator of the quality of sleep – the polysomnography (PSG) results of subjects sleeping on each bed mattress were measured using a bio-amplifier. PSG is a comprehensive recording of the biophysiological changes which occur during sleep. Additionally, the subjects' body motions during sleep were measured with an actigraph (accelerometer) by calculating how many times each subject turned over in bed. The PSG-based evaluation revealed that the depth of sleep was greater for bed mattresses with higher elastic moduli. With regard to turning over during sleep, the motion of the legs was less than the motion of the arms for bed mattresses with lower elasticity moduli. This was presumably because the subjects on bed mattresses with lower elasticity moduli slept more lightly, since it was not easy for them to turn over as the area from the lumbar to the gluteal region sank deeper into bed mattresses with lower elasticity moduli. It was therefore concluded that the frequency of turning over in bed is as useful as PSG when used as an indicator by which to infer quality of sleep.

Keywords: Sleep, Bed Mattress, Comfort, Polysomnography (PSG), Actigraph

(48) Research into Pictorial Design Trend of Chinese Characters

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Design of pictorial characters lies in the application of picture in proper combination and replacement with different positions in a character. This will equip the character with an image of individuality, and then make a deep impression on consumers or form a unique image for activity advertisement. With the pictorial design, we can accelerate and reinforce the conveyance of information, and express the sensation a pure character fails to reach. The purposes of this research lie in making clear the design properties of pictorial characters, making a survey and tendency analysis of the properties, and further examining the recipients?emotional cognition categories under simultaneous influence of the two design properties. From January to April of 2009, by means of natural observation, we sampled purposively the signs, package, and printed material of shops in Taipei, Taiwan, for their design of pictorial characters. We obtained a total of 110 samples, and found from observation and analysis of the samples that: (a) Application of pictorial design of Chinese characters exists in all kinds of printed materials. Application in package accounts for 40.9% of all samples, in printed material is second (35.5%), and in shop signs is in the minority (23.6%). (b) Application of the six categories and structure of Chinese characters leads to the discovery of two design properties of “connection between picture and meaning?and “character completeness for picture? “Connection between picture and meaning?acts as analysis of picture applied in the six categories of Chinese characters and design of pictorial characters. “Character completeness for picture?is the level of varied positions replaced by picture in being a complete character. It is divided according to the structure of Chinese characters. (c) Statistics of “connection between picture and meaning?for pictorial characters show that “high connection?(37.4%) is in the majority. In terms of the three levels in “character completeness for picture? “stroke?(51.8%) is in the majority. As for combination of the two properties, “high connection?combined with “stroke?(21%) is in the majority. It is also the most frequently used combination at the present time. “Medium connection?combined with “outline?(3.6%), on the other hand, is in the minority. Application of this combination can make a striking difference in the current design. (d) The survey on emotion categories is in progress. In terms of pictorial design of Chinese characters and appropriate combination between the picture and character, this research is expected to provide with its results a useful reference for graphic designers, and become a great help in the field of design or teaching Chinese characters.

Keywords: pictorial character, six categories of Chinese characters, connection between picture and meaning, character completeness for picture, emotion

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(162) Computer aided design of individualized best fitting pants

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An automated design system for making the best fitting pants considering personal figures was developed. The best fitting pants means fitter pants for individual body than ready-made clothes. It is more comfortable to wear than ready-made clothes and does not restrict persons' movement. Three dimensional body shape of wearing person was obtained by 3D scan of the person and the deformable virtual body which reflected person's measurements. Then, we made a three dimensional pants model which wrapped the virtual body. Appropriate allowance was added to the body shape from the waist line to the hip line to make three dimensional pants model. The most important configuration, which should be controlled, could be the crotch line of pants. The crotch line is a line of intersection of median plane for the pants model. The first crotch line was extracted from the body shape before deformation. The crotch line of pants was made by connecting second order B-spline curve from determined node points. Abdomen protraction point or pubic symphysis point, intersection of median line and gluteal sulcus line were selected as the node points in the front part. The stuck out point of buttocks part, intersection of median line and gluteal sulcus line were selected as the node points in the back part. Allowance to the crotch line was given by moving the bottom node of spline curve down. The whole model shape was changed according to the deformation of crotch line. The leg parts of pants model were obtained by deforming the leg shape of the body model straightly. The allowance for legs parts was given by magnifying the hip line. The patterns were made by the automatic draping system which we developed with mentioned pants model. As a result of wearing the pants which we made by this system with three dimensional measurement of wearing persons, it was able to make pants that reflected individual figures. The made pants contained suitable allowance for movement such as sitting down at seat, expansion and contraction, and walking. Furthermore, the buttocks part did not swell out and had better shapes than those of ready-made clothes. In this study, it was possible to make the best fitting pants which reflected the shape of individuals by the design method.

Keywords: Pants, Individualize, Pattern making, Clothing design

(340) How quickly do people become bored with new information?

A survival analysis of vogue words appearing in newspapers

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The purpose of the study was to examine when new information becomes old. Muramoto (2007) studied the correlation between the frequency of use of vogue words in weblogs and TV shows. In this study, we conducted a frequency analysis using newspapers and asked participants to evaluate the newness of topic keywords. We analyzed the frequency of use of vogue words in newspapers and compared the frequencies among the years 1997, 2002, and 2007. We considered the period between the peak usage and disappearance of a word as the word' s lifetime, and conducted a survival analysis to compare survival curves among the years 1997, 2002, and 2007. The results showed that the survival period for vogue words was significantly shorter in 2007 than in 1997 ($p < .05$). In 2007, half of the vogue words disappeared in 4.7 months. Because people might start getting bored with vogue words before they disappear from newspapers, we conducted a survey wherein we asked participants to evaluate the newness of topic words. The results showed that the words were likely to be regarded as new words in the first month after their first appearance but as old words in the second month after their appearance. In brief, our study suggested that nowadays, people may become bored with a vogue word two months after its appearance and vogue words may disappear five months after their peak usage.

Keywords: weariness, vogue words, frequency, questionnaire

2010

(516) The System of safe and comfortable 'KANSEI Web Service System'

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Infrastructure valuing Web service of the usual doesn't necessarily fit user's feelings. In this paper, we propose the system construction method by using KANSEI contents. It is shown that our "KANSEI Web Service System" provides feeling safe and comfortable.

Keywords: safe and comfortable, Web Service, System Development

(520) Research on Sex Appeal and Product Design

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In the past, the word sexy was used in a negative way implying impurity and obscenity. Recently, however, the immoral connotations of sexy have changed into a more positive meaning of sexual charm or appeal. The purpose of this research is to clarify the relationship between the sex appeal and sexiness of product design and how it relates to our preference or liking of the product. Therefore, we conducted two experiments to help clarify and quantify the terms. In the experiments, the subjects were asked to evaluate some product designs on the following areas: Level of a Human Theme or Motif, Level of Sexual Appeal, Level of Sexiness and Level of Personal Preference or like. As a result, our data shows the following: 1) The sex appeal and sexiness of a product affects how people view the product. 2) The reduction of sex appeal and sexiness of the female body reduces the perceived sexiness of the product. 3) A correlation exists between the strength of sex appeal and sexiness; in a limited area, increased sex appeal leads to increased sexiness. 4) The subjects showed that men and women have different preferences as the levels of the sex appeal and sexiness of women's breasts change. 5) In general, as the sex appeal and sexiness increased, the preference for that product design decreased. For women, however, as the product design increased in sex appeal and sexiness preference also increased, especially in the case of the cup most suggestive of physical sex.

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Keywords: Sexy, Sex Appeal, Product Design

(8) Applying an Interpretive Structural Modeling Method to Design Consumer Preference-based Products: Another Case Study

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The purpose of this study is to test the feasibility of applying an interpretive structural modeling (ISM) method for consumers to design consumer preference-based products. Many studies have indicated that the fulfillment of consumer needs is an important prerequisite for the development of successful products, showing the importance of developing an approach for designing a consumer preference-based product is supported. This study presents an ISM method for developing consumer preference-based products. A razor will be used as the test case. The experimental results from this study provide product designers with a new design approach for designing consumer preference-based products.

Keywords: User requirements, User-centered design, Product design, ISM

(29) Applying Structural Method Based on AHP and ISM for Developing Attractiveness Questioner

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To enhance the likelihood of success of a product when launched onto the market, it is essential to assess the attractiveness of its product form during the design stage and to remedy any perceived form-related defects if necessary. However, few practical approaches exist to developing attractiveness questioner. Consequently, product form designers lack reliable indicators to guide their design efforts towards developing products which will satisfy the consumers?needs. Therefore, this study proposes a structural approach based on AHP and ISM to develop attractiveness questioner. The Structural approach includes three stages: A. Identify the attractiveness item, B. Use AHP purify attractiveness item, and C. Layout attractiveness questioner via ISM. This study provides a structural method for developing attractiveness questioner.

Keywords: Attractiveness questioner, AHP, ISM, Structural approach

2010

(526) Components Related to Sensorial Decision Using ANN Preprocessed with Aura Characteristics

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It is necessary to develop new signal processing systems to confer on robots ' the ability to behave in a kansei manner' in response to sounds. In this study, the components of sensorial decision in response to sound are investigated using an acoustic diagnostics system that outputs a sensorial decision modelled after the mechanism of processing in humans. The loudness function is applied to the loudness of the sound, and mel is applied to the pitch. The averaged result of the frequency spectrum is input into an artificial neural network (ANN). Samples with only slight differences are used as diagnostic subjects to examine the ability to differentiate between the sounds. The ratio of correct answers is increased by combining mel and the loudness function, and there is an optimal loudness of sound to obtain the correct answer. Only parts of the aural characteristics of humans are utilized in this study, but the results indicate that it is effective to consider such nonlinear characteristics.

Keywords: acoustic diagnostics, neural network, aural characteristic

(502) Provisions to Restrict Amendments or Corrections in the Patent Act

Around the judgment of the Intellectual Property High Court, on June 12, 2008

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Revisions have been made to the Patent Act, with the objectives of simplifying the trial system, solving cases in a reasonable manner, giving early judgments, reviewing the assignment of authority between the Japan Patent Office and the court, and globalizing the system, since 1993. This study reviews the series of Patent Act revisions that have been enacted and examines the provisions to strengthen protection of trade secrets in court, limit patent rights in actions for infringement, and restrict corrections, as well as the correction system related to the court. In this context, the author considers the provisions to restrict amendments or corrections in the Patent Act centering around the judgment of the Intellectual Property High Court on June 12, 2008, of the case ' Clothes having a property to maintain shape.'

Keywords: trial for patent invalidation, request for correction, amendment, new matter, judgment rescinding the trial decision

2010

(522) Research on Emotag Photo Browser System based on 'Impression'

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Moving experiences, in turn, leave an 'impression' that often affects future life decisions. Our research proposal focuses on how to construct a better photo browsing system, with special attention paid to the emotive impressions of the photographs. Therefore, we surveyed 71 students (40 men, 31 women) from Future University-Hakodate. We asked the subjects to think about their every day lives and asked them the following questions. 1) 'What event in your life was most impressive (ie, leaving the biggest impression)?' 2) 'Why were you impressed?' 3) 'What changed because of the event, experience?' and 4) 'How do you feel now recalling the event, experience?' The survey has revealed that subject's impressions are related with surprise, achievement, love and strength of memory especially. As a result, we propose the photo browser system using creating emotive tags, or emotags (emotive tags) in addition to the tags.

Keywords: Impression, Memory Recall, Photo Browser System

(188) Comparison of Immersive Feeling Effects among Three Wide-Angle Image Projection Techniques

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An assessment experiment compares three wide-angle image projection techniques: ''simple enlargement,' ''video mosaicing' and ''pseudo wide-angle images' and finds what is the most effective in producing an immersive feeling. Results of the assessment experiment are examined by Steel test and factor analysis. The most effective technique is useful in changing our living room into a human-scaled immersive image theater.

Keywords: entertainment, media, wide-angle image, immersive feeling, assessment

2010

(83) A Research of Absolute Threshold of Hermann Grid

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The Hermann grid illusion is an optical illusion. In advertisement, some designers used to make vision illusions to confuse consumers. The responsibility of advertisement designers should be telling the truth to consumers, but not treating consumers by vision illusions. So in the research we want to know how to stop the vision illusions, then designers won't cheat consumers by vision illusions. In the research we use "Method of Constant Stimuli? Stimuli are presented numerous times in random order and the subject reports whether he/she can detect them. In stage 1, 16 subjects are sophomores of Department of Creative Design of National Yunlin University of Science and Technology. And in stage 2, we have 20 subjects from Multimedia Design Department of Fortune Institute of Technology, all of them are sophomores. In the research we decline and rotate the squares in Herrmann Grid to get the absolute thresholds. In stage 1, absolute threshold is 8? and in stage 2 absolute threshold is 6? In stage 2, the absolute threshold of the experiment 1 is 14? and the absolute threshold of the experiment 2 is 6? In the research we have three control factors, 'direction of vertical lines?and 'direction of horizontal lines? and 'decreasing the area of squares? When rotate the squares, the control factors are 'direction of vertical lines?and 'direction of horizontal lines? When rotate the squares, the control factors are 'direction of vertical lines?and 'direction of horizontal lines? The effect of 'decreasing the area of squares?is much more then the effect of 'direction of horizontal lines?

Keywords: Hermann Grid, Vision Illusion, Absolute Threshold

(383) Visual Perception of Dynamical Change in Emotional Faces vs. Objects

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The perception of dynamical changes in a visual scene is of paramount importance in the processing of environmental signals necessary for adaptation. These signals however rely on different kinds of causal interaction. While changes in inanimate objects require the intervention of an external cause, changes in faces relate to intentional properties. There could be thus specific patterns of brain processing for objects and for emotional faces, and these distinct patterns could lead to distinctive perceptual responses. To test this hypothesis we set up a morphing methodology allowing compare dynamic changes of emotion in faces with dynamic changes in natural and artificial objects. Seventy-two participants were presented videoclips of dynamical changes at various speeds to determine the optimal perception of the change of states with two orders of transformation (ABA, BAB). After each videoclip, the participants were asked to choose, among non-targets, the image that was B in ABA, or A in BAB. Behavioral data and Response Times were collected. Results show that participants were less successful in choosing the target emotion when confronted to fast transformations. The effect is reinforced when faces are presented in the BAB order. These data bring to light a significant effect of the speed of transformation, type of stimuli and order of transformation on the perception of facial and object transformations. They suggest that the complex cognitive processing of dynamic changes may differ according to the stimuli: face vs. object.

Keywords: Visual perception, Dynamic process, Morphing, Emotional faces, Objects.

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(452) Design Candidate Identification via Kansei-VR & AHP approaches

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In this work the Authors shows the first results of a research activity aiming at the identification of the most appealing design candidate via a new integrated Kansei Engineering process. The target was achieved by means of Virtual Reality (VR) along with an Analytic Hierarchy Process (AHP) performed in a desktop environment. Both the approaches aim at the direct involvement of users into the design process, as early as possible. Focusing on the synthesis phase, once implemented the design candidates by different technical features according to a Factorial Design, the concepts are evaluated by users. The data collected by asking users to judge them are analysed via suitable methods to guarantee the above assessment. For this purpose, two different evaluation approaches, although at different stages of the design process, are tested and compared: the first one relies on the user experience with the product in VR whereas the second is new to the Authors and is allowable for a much cheaper visual pairwise comparison in a PC-based experimental set-up. The original result is that the two approaches are complementary rather than alternative and the way to harmonize them in an integrated KE process, in order to improve and speed-up the synthesis phase, is discussed. In order to describe the two approaches and highlight their peculiarity, an application to the design of railway coach arrangement and furniture (briefly referred to as 'train interior') is presented.

Keywords: Kansei Engineering, Virtual Reality, Design Evaluation, Pairwise comparisons

(166) Kansei Design of LCD Panel Specifications

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Even though liquid-crystal displays (LCD) have become a part of our life, the technology-oriented specifications for panels left consumers with difficulty to get close to and understand them. Applying Kansei Engineering approach and Design of Experiment (DOE) method, this study tried to measure users' feelings about the designs of LCD displays and the relationships between the specifications of LCD panels and Kansei evaluations efficiently. The results of this study could help designers understand consumers' Kansei preferences of LCD displays, and choose the most appropriate LCD panels to achieve better overall display design. By proposing a Kansei specification for the LCD panels that assures a user-friendly interface, the results of the study would also provide manufactures a reference for developing new technology of LCD panels. The results of this study show as follows: (1) Users' Kansei words of LCD panel specifications could be extracted as 8 representative Kansei words including Bright, Sharp, Vivid, Comfortable, Natural, Graceful, Friendly, Energy-saving. (2) Contrast Ratio of LCD panel specification is the most significant to drive the positive feeling and image, followed as Resolution and Gamut. (3) Contrast ratio, gamut and resolution have significant influence to Kansei word 'Energy-saving' with negative relationship. (4) The predicted equations are confident by test, and could be used as reference for user-friendly interface.

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Keywords: Kansei Engineering, Kansei Evaluation, LCD Panel Specifications, LCD Displays

(524) Proposal of a New Publication Process Using the Kansei Table System as a Means of Distributing University-Generated Knowledge

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Broad distribution of university-generated knowledge is one of most important issues of Japanese universities today. The aim of this research is to present a new concept of knowledge editing and university publishing process. First, the mechanism of the system called the 'Kansei Table System', which is under development in Kyushu University, Japan, is to be explained with reference to the matching mechanism and 'kansei' classification. Second, a survey of the university press system is to be performed, especially focusing on their history and some current problems, and in addition, some cases as examples of their publication trends. Third, some possible publication projects using this system will be surveyed. Lastly, a verification method for examining the efficiency of this editing procedure is to be considered.

Keywords: Knowledge, Publication, University, Value creation

(240) Kansei engineering as an ergonomic and technological concept derived from customer's preferences about a product *Case Study of Iranian Handicraft*

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Kansei is in fact the technology that translates customer's emotions and imaginations to different elements of product design. Iranian handcrafting, as an independent and local industry, is believed to be one of the most prominent examples of Applied Arts and is one of the three main poles of global handicrafts industry with the most diverse sub branches compared to other countries. Customer's behavior is under the influence of many factors such as cultural, social, personal and psychological elements. Customer's behavior is a process that involves three stages of: pre-purchase, during purchase and post-purchase phases. In this research, we intend to use Kansei and its focus on spiritual and mental needs alongside personal tastes to study the art of Ghalam Zani (Chasing) in Isfahan. We use terms familiar to or provided by customers in order to reach the connections between patterns of Chasing crafts and customer's emotions, and its important role in traditional handicraft marketing improvement. This analysis will delve into the reasons behind the relationships between the shapes and patterns used and the tastes of customers and tourists. We have made a survey in traditional Bazaar of Isfahan and finally we analyzed the results, discovering what makes a traditional handicraft best seller.

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Keywords: Kansei, Customer behavior, Imprresion, Traditional handicraft

(477) Design with Emotional Approach by Implementing Kansei Engineering- Case study: Design of Kettle

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In recent years, applying emotional methods as subjective evaluation process of contents in the product design community is increasingly concerned. One of the most promising methods that integrate design, emotions, engineering and computer is Kansei engineering. It has been demonstrated that if the consumer's feeling and image (Kansei) of a product in mind could be implemented in the new product, consumer would be more satisfied with the product. The purpose of this study was to measure the Kansei of a product evokes in a customer's mind, and as a case study designing a new kettle was programmed. 10 samples of different types of kettles were used in the physical part. Products are evaluated on semantic differential scales and also categorized in respect to theirs attributes. A list of adjectives was complied that impressions and sensations people receive from kettle, and then a total of 30 words were selected and used in semantic part. A 7-point scale questionnaire using these words was found suitable. 70 subjects participated in our study and they asked to fill in questionnaire based on their subjective evaluation. The samples were analyzed and statistical methods are then used to find correlation between attributes and perceived expression or users feelings. In developing new products this statistical data is used to make decision on the properties of a new design. Afterward, based on all finding and results, some candidate samples were designed. In the next stage of our study, the new design of kettle was again validated by questionnaires and recommendations for final design were given.

Keywords: Kansei engineering, Product design, Semantic Differential method

(4) Design Method od Applying the Association of Science Fiction to Emotional Arousal

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Scenario Building has been widely used in conceptual visualization design methods. It enables the designers to envision the variable user scenarios, so that they can design products closer to the "make real" user experiences. In recent years, the consumers have been paying more attention to the emotional side of the products. Therefore, how to impart emotional expression in the products has become a major subject of development among designers. This research proposes an emotional arousal method with replaceable imagination, and uses a design project of vacuum cleaner themed upon associations of science fictions to demonstrate the application of this method to more deeply explore the designers' originality for developing products with emotional attributes. The scenario operation and association procedure implemented in this research include the following four elements: deciding scenario types, behavioral observation, scenario building, and constructing a creative thinking matrix for form development with emotional arousal. Through the conceptualization and development processes of the vacuum cleaner design project, the adopted scenario of science fiction were presented to show how it was incorporated in developing a emotional product with flavor of science fiction. The advantages and potential problems of applying this design method were discussed in the last section of this paper.

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Keywords: scenario building, emotional arousal, design method, science fiction, association

(425) An association experiment for finding emotional expression between design and music

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What is the problem? Since digital technology has emerged to design world, no matter industrial design, architectural design or visual communication, design itself has evolved into a 'new' thing that is often regarded as new media. With rooted in digital technology, new media is always proud of its rich visual artifacts in the representation of design. However, while emphasizing on visual, non-visual elements such as ambient environment, space and physical features are somehow not quite into the main stream or some even ignored. Among those, music or sound elements are one of major problems. Designers with no music backgrounds usually have difficulty understand music that led to a music-unfriendly design. Therefore, our research is aiming at studying how music can be integrated into design process or even music-aided design. Integrating music into design process In terms of design process, we divided design process into rational reasoning and emotional expression. Rational reasoning is learned via pedagogical method and several methods for shape and form composition have been tested for years and proved to have good impacts. However, the emotional expression that is how the design affects users or consumers is taught in studio-like fashion mostly. In this research we document an experiment based on integrating music components into teaching design for novice designers. The reason for choosing novice designers is because novice designers are often not into a design pattern therefore are willing to explore more possibility for design. The data collected will be more effectively. Several researches from International Computer Music Conference starting as music information retrieval conference have conducted researches onto music representation based on the computing technology or artificial intelligence research. Among those, several attempts such as The Interactive Event Manager (2009), Hyperinstruments: (Machover 1992) and Hyperscore (Farbood, Pasztor and Jennings 2004) are already trying to visualize the music to images or generated images. One group of researches (Schenker 1969) tried to retrieve the meaningful results from music and another (Yang and Chen 2003) then discovers the possible mapping between meaning and visual elements. How we approach We use (Yang and Chen 2003) as the basic tension-rhythm framework for the experiment conducted in this research. We will also use SD method to analyze the data retrieved from the experiment and evaluation. Framework and pilot test are applied onto a group of novice targets who are either in music or design background in duration of six months. A web-based platform is implemented for testing and collecting the data. Further on the experiment as well as the implemented platform will be elaborated in the final paper.

Keywords: music, image, emotional expression, adjectives, association

(140) The Procedure of Emotion Arousal from Words and Images

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Words and images are important tools of communication in our daily life. At communication behavior they are often presented at the same time. (talking, facial expression, gestures, posters, medias¡K). This article, by the arrangement of words and images, is to explore the meaning of the cognitive processes and emotional, if they are. We try to understand the written words and images at the same presenting cases, the emotional factors that have been aroused. This questionnaire is designed to carry out in three stages, the first phase will show words, images and emotions along and to collect the temperature of their feelings. The second phase will be words and images mix in three models with posters, and test the significance of their cognition. The third phase will be these three models posters to test their emotional perception. Through this arrangement, we found that the cognitive aspects of meaning, it seems that the influence of the words is larger than the influence of the image. In the emotional sense, though words still higher influence than images, but the emotional significance of perception will be closer to the instinctive response.

Keywords: emotion, cognition, images, meaning

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(136) The Features of Chinese Typeface and its Emotion

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Chinese characters, a kind of hieroglyph, contain different shapes and styles and also provide a meaningful feature in vision transmission. Due to the huge amount of characters, designers are usually based on self-experiences with no auxiliary system of unified meanings for characters in the viewpoint of emotion. This study intends to find out the relationship between characters and their emotion, and contains two purposes: (1) To define the characters' features, (2) To find out the characters' features and its KANSEI words. Therefore, the features are discussed for Chinese characters based on PANOSE SYSTEM 2.0, the Latin font classification system. In this system, the major categories contained: (1) genre, (2) serif, (3) weight, (4) topology, (5) contrast, (6) angle, (7) tool kind, and (8) aspect ratio. The features are divided into 8 major categories with 40 elements. 8 KANSEI words in 4 styles (elegant, Vigorous, gentle and simple) are selected for typefaces by 30 persons. The relationship between the features and KANSEI words are analyzed by using the Quantification type I method. According to the results, Genre, Serif, Tool kind, and Aspect ratio affects the emotion greatly, and the following is Topology, Contrast, and Angle in terms of 8 KANSEI words in 4 styles. It is helpful for designers or amateurs to transmit an imagery precisely.

Keywords: Chinese character, Typeface, KANSEI

(451) AIBOcom: Designing Robot Enhanced Human-Human Remote Communication Technology

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Nowadays, more and more people live far away from their homes and families, e.g. due to work commitments, seeking education in different countries, relatives moving to another country etc. During such a time of living apart, communication strengthens the relationship between two or more people by using communication technology which may offer voice or video. The goal of our research is not to replace real world interaction, but to enhance remote communication in cases where face-to-face contact is not possible. There are many applications available for video communication such as Skype, MSN, ICQ, etc. However, regardless of the fact that video conferencing offers both video and voice it still misses an important sense that could be transferred through distance - namely touch. Through this sense, a more interactive and enjoyable communication could be established, if the means of interaction are designed well and are acceptable to the users. Such technology could be anything from a robot to a complicated device that has to be worn by the user. There has been similar research in this field such as the Huggy pajama and the poultry internet . However, these technologies require special hardware on both ends which may be difficult to be obtained and to be accepted by the users. AIBOcom is a touch communication project which enhances the current technologies like Skype and MSN, by introducing a robot at both ends of the communication channel. The robot that has been chosen to undertake the role of a touch interactive device is AIBO. AIBO is a generally being well accepted by its users and is widely spread to many universities and households. Note, the technology we develop does not depend specifically on the particular robot being used. AIBOcom utilizes the body of the AIBO to allow the users to interact with it, giving them the ability to play a 2-player game. The purpose of the game in this experiment is to guide a virtual character in a computer maze by using the AIBO as an interaction tool and, conceptually, as a 'joystick'. The user guides the virtual character by moving a pink ball in front of AIBO. The user is expected to interact with the AIBO like a real pet in order to satisfy and fulfill its internal variables/needs. During the game, AIBO runs in autonomous mode and executes dog-like behaviors according to its internal variables. In order to finish the game, both users have to co-operate by interacting with their robots and by using voice and body gesture. The co-operation is essential since each AIBO is affecting the other AIBO's internal states at every interaction and time step. The evaluation of this experiment uses various sources of data gathered from 10 pairs of participants, including video data for assessing facial expression, enjoyment and robot interaction evaluation, computer log files for the evaluation of the effectiveness of the interaction, questionnaires for enjoyment evaluation and computer screen capturing to complete the evaluation. The presentation of this abstract will include results from this study.

Keywords: HRI, remote communication, social mediation

(95) Kansei Evaluation of Behaviors of Robot which Recognizes Difference between User's and its Own Fields of View

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Generally there are many objects which can cause visual occlusion in daily living spaces for humans, where human-symbiotic robots will work. Consequently, it will often occur that a robot cannot see an object by occlusion while a user can, and vice versa. In such situations, it is desirable for the robot to be able to interact with a user while recognizing a difference between their fields of view. We expect that such a 'considerate' robot will be friendlier and more pleasant to users. In this paper, we carry out experimental subjective evaluations of impressions which such robot gives to humans during human-robot interactions to verify our expectation. We have developed a robot which can estimate a user's and its own fields of view to behave appropriately while recognizing the difference between their perceptions in our previous works. Participants are requested to observe the interactions in occlusion environments and to subjectively evaluate impressions which they receive from the developed robot's behaviors. The experimental results show that the robot which can guess a user's perception and understand differences between their recognition of situations can give 'familiar' impressions to humans. This fact is expected to be one of fundamental recommendations for designing much friendlier interactions with robots and other intelligent systems.

Keywords: Human-robot interaction, Impression evaluation, Visual occlusion, View estimation, Difference in perceptions

(93) On the Design of a KANSEI Robot Testbed for Understanding Human-Machine Interaction

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GRANT Edward, North Carolina State University, United States
LEE Gordon, San Diego State University, United States

The design of autonomous controllers for mobile robotic systems continues to be a challenge, due to the complexities and uncertainties of not only the robotic systems but also the environment. In this paper we present a different approach to vision-guided mobile robot navigation. Instead of using a rule-based controller, a neural network controller was trained, mapping a human-operated joystick command to capture robot images. Using a back-propagation gradient descent training algorithm, a controller has been developed to successfully navigate the robot to its goal. The research effort to be presented in this paper represents preliminary work on the development of a KANSEI robot testbed; in particular, a simple neural network controller in combination with human reaction monitoring and post processing is developed. Currently, computer vision and a joystick are used but additional sensor platforms can be developed to capture human reaction in interacting with the robot for a collaborate activity. The validity of the approach is tested experimentally on a mobile robot with vision capability. Results show that the using human reaction to capture robot images provides a feasible architecture for designing mobile robot controllers. Future research involves characterization of the newly designed controller to the rule base controllers and evolutionary algorithm controllers previously designed as well as the development of additional sensors for both human and robot in order to capture how the mental functions of humans operate in a goal-oriented scenarios which can then be transferred to mobile robots leading to enhanced human-robot interaction. For example, one approach that may be employed to generate the emotion processing agent is the use of a KASER which has shown promise as a heuristics-based architecture, using randomization and symmetry for learning. This architecture also allows the building of a knowledgebase (knowledge processing agent) as more experience (robot runs) are performed. These tools can be integrated into the testbed to improve the transference of intelligence between human and robot.

Keywords: robot testbed, neural network control

(519) Comparison of learning willingness by using English conversation CD teaching materials and English conversation robot

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In this paper, we propose a new method of communication robot as teaching materials of English conversation. We inspect and compare English conversation robot with English conversation CD teaching materials in that respect continual of learning willingness.

Keywords: Robot, English conversation, Learning willingness

(315) Eye Movement & Facial Expression in Human-Robot Communication

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As the interest in social robotics grows, we examine human-human communication to develop more comfortable and effective models of human-robot communication. Person to person communication incorporates both verbal and non-verbal communication channels to add expression and detail to communicative interactions. This work focuses on non-verbal facial expression, and head and eye movements. Recording of directed conversations between the experimenter and participants was performed. The analysis of the data reveals strong correlations between speech generation and facial non-verbal behaviour. Specifically, we look at the correlations between blinking and communicative behavior, as our results suggest that blinks have a communicative function to inform the speaker of the listener's mental communicative state. This has further led to the creation of a blink generation model for later inclusion into an overall anthropomorphic model of human facial behavioural characteristics within communication.

Keywords: Human-Robot Interaction, Social Robotics, Eye Movement, Communication Modelling, Blink Modelling

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(218) Kansei Evaluation on Museum Website Designs

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Most of the studies on marketing National Palace Museum focused on the aspect of brand development and marketing strategies. There is relatively little research regarding the Kansei appealing of the Museum's website, not to mention any comparison with other world-class museums has been carried out. According to the report of The Times, National Palace Museum 'houses the best collection of traditional Chinese artifacts anywhere in the world.' However, as a world-class museum, its website should be a very important platform that greets the international visitors. Therefore, the purpose of this paper is to analyze the design of world-class museum homepages and National Palace Museum homepage with Kansei Engineering approach in order to gain understanding to what kind of overall feelings does the websites present to its viewers. Five cases including Louvre, The Metropolitan Museum of Art, The British Museum, The State Hermitage Museum, and National Palace Museum were studied. The findings of this study aims to benefit the design of museum homepages and contribute to the Internet promotion of museums. Museums can design websites eliciting certain feelings. As a result, more visitors and users could be attracted to visit the website or even the museum.

Keywords: Kansei Engineering, Website Design, Museum, Emotion, Promotion

(170) Kansei Evaluation on the Visual and Hearing Image of Interface Design

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Most of the studies on marketing National Palace Museum focused on the aspect of brand development and marketing strategies. There is relatively little research regarding the Kansei appealing of the Museum's website, not to mention any comparison with other world-class museums has been carried out. According to the report of The Times, National Palace Museum 'houses the best collection of traditional Chinese artifacts anywhere in the world.' However, as a world-class museum, its website should be a very important platform that greets the international visitors. Therefore, the purpose of this paper is to analyze the design of world-class museum homepages and National Palace Museum homepage with Kansei Engineering approach in order to gain understanding to what kind of overall feelings does the websites present to its viewers. Five cases including Louvre, The Metropolitan Museum of Art, The British Museum, The State Hermitage Museum, and National Palace Museum were studied. The findings of this study aims to benefit the design of museum homepages and contribute to the Internet promotion of museums. Museums can design websites eliciting certain feelings. As a result, more visitors and users could be attracted to visit the website or even the museum.

Keywords: Kansei Engineering, Website Design, Museum, Emotion, Promotion

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(133) Study on Conflict of Evaluation Values and Interest of Respondent in Questionnaire data

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Companies often employ questionnaire(s) in order to design marketing strategies or to grasp the trends. For example, when companies plan a new project, they often survey the impression for it by a questionnaire. And then the analysis of the questionnaire gives them the marking strategy with the prediction of marketing scale or the target group to sell or the hint of modification of the product. The rating scale method is widely used in questionnaires designed to obtain impressions about such evaluation subjects as products, services and brands. This method requires multiple evaluation subjects and multiple questions, and respondents answer to each question by grading their impressions about the evaluation subjects from multiple grade scales while looking at each of the subjects. In the way we can quantify people's impressions about evaluation subjects in the form of graded data. Questionnaire data used to be carried out by face-to-face survey or mail-in survey. Recently, Web questionnaire survey becomes popular with the spread of the Internet in order for companies to reduce cost and to get a lot of questionnaire data. However, in the Web questionnaire survey, some respondents do not respond the questions seriously, for example, responding randomly without looking questions or responding to all questions with same evaluation value, because it is not done face-to-face and is done basically to get giveaway or points. If those responses are included to questionnaire data, there is a possibility that the analysis result of the data is not accurate and shows different characteristics or trends. This paper proposes a quantification of the conflict of response and the interest of respondent based on the evaluation value. Conflict of response is based on contradiction between pair(s) of questions with counter meaning. In a rating scale method, the contradiction of evaluation value is defined as quasi-coefficient of correlation between counter questions that employs the median value of grade scales instead of the average value. Interest of respondent is derived from the average of variances of evaluation values for each object. In a rating scale method, the questions usually consist of both positive meaning and negative one, then it can be assumed that the variance of evaluation value becomes large when a respondent has interest for the evaluation subjects and deeply thinks about them. This paper also show an interactive clustering method based on the visualization result, which a user clusters the respondents interactively with trial and error. It is expected that appropriate analysis can be done by the proposed method. This paper applies the proposed method to actual questionnaire data on a new outdoor product. It compares the analysis result between the proposed method and the conventional method, without considering the conflict of response and the interest of respondent. It shows that we can find important groups of respondents for the marketing strategy by the proposed method, which are difficult to find by the conventional one, and effective analysis can be done.

Keywords: Analysis of Questionnaire Data, Visualization, Interactive Grouping, Fuzzy Theory, Multi Dimensional Scaling

(405) Perceiving the faces of Buddha statues
On the relation with viewpoint and affective evaluation

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Although the ambiguity or ambivalence in facial expressions of statues of Buddha has been often mentioned (e.g., as in 'archaic smile') and attracted people, little empirical study has been done on the perception of faces of Buddha statues. This is partly because the faces (and facial expressions) of most existing Buddha statues' faces varies greatly. We have approached this issue from various perspectives by using a number of statues of Buddha at the Sanju-san-gen-do temple (Kyoto, Japan), which have notably high inter-statue uniformity. In the present study, we employed questionnaires to examine how people perceive the statues' faces and to demonstrate people' general and their specific trends in perceiving the statues. The stimuli consisted of facial images of 48 statues of Buddha with two shooting angles (front, 0° and lower, 14°); a total of 96 images. One group of participants (N = 94) evaluated gender, age, facial expression (selected from 'sad', 'happy', 'angry', 'fear', 'disgust', and 'surprise'), and gaze direction (1 = avert gaze, 5 = straight gaze at observer) for each image. The other group of participants (N = 111) rated how much they liked (or disliked) each statue (1 = dislike, 5 = like). The general trends in the results showed that the estimated age of the statues was 40.42 years in average (SD = 9.03) and that the images were evaluated more often as male (74.40 %). The frequency in selecting each facial expression were; 'sad' (31.96 %), 'disgust' (23.27 %), 'angry' (20.07 %), 'happy' (11.00 %), 'surprise' (8.96 %), 'fear' (4.73 %). The evaluated gaze direction was 3.00 on average (SD = 1.26) in the 5-point Likert scale. Interestingly, the shooting angle influenced the participants' evaluation despite the fact that the images were taken from the identical statues. The low-angle images were evaluated as older than the front images ($p < .0001$). For the low-angle images, the frequency in selecting 'sad' was lower and the frequencies of 'disgust', 'angry', 'happy', and 'surprise' were instead higher as compared to the front images ($ps < .05$). When we analyzed the individual statue based on the participants' affective evaluation, we found negative correlations with the estimated age ($r = -.51$, $p < .001$) and with the evaluated gaze direction ($r = -.40$, $p < .01$); in other words, if the participants liked a certain image, it was tended to be evaluated as younger and not looking at them, or vice versa. For the facial expressions, there were positive correlations of the affective evaluation with the selection of 'sad' and 'happy' ($rs > .31$, $ps < .05$) and a negative correlation with 'disgust' ($r = -.55$, $p < .01$). These results suggest that people perceive the faces of statues of Buddha in a relatively consistent manner. However, the viewpoint substantially affected the perception of the facial expression and the perception is related to whether or not they like the statue.

Keywords: Facial expression, Gaze direction, Affective evaluation, Buddha statue

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(600) Kansei Evaluation on Bamboo Curtain Design

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This study employed Kansei Engineering approach to help the bamboo curtain designers understand consumer's feelings and preferences about the product. The goal was to effectively master and apply all elements to the new designs that conform to the demand of the target market, and hopefully to revive the bamboo curtain industry that has gradually declined and yet still has great potential. In order to meet the customers' needs and their psychological desire correctly, the preliminary design of various bamboo curtains were tested by using Kansei Engineering approach to choose the elements of the traditional bamboo door curtain design. It will thus be used to redesign a new door curtain with the rearrangement of each element. In the future, we can systematically categorize these new designs and choose appropriate samples for surveys and analyses of the impression of the bamboo curtain using the kansei adjectives, not only to find customers' needs from the new designs but also to extend the life of this traditional industry.

Keywords: Kansei Engineering, Bamboo Curtain, Creative Design, Local Industry, Cultural Industry

(300) Image Cognition Study Pertinent to Physical Interactive Design of Public Art

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Under private and government efforts and promotion, public art in Taiwan has made noticeable progress. Influence from diversified thinking and performance in modern art, as well as availability of compound mediums and digital technology have made people discovered the versatile appearances of interactive design for the five senses. Based on visual interactions, public art has been extended to involve interactions through physical contact, voice, the venue, behavior and advanced sensor devices. Subsequently, the expression of public art has become richer and interactions between people, the artwork and the venue are increased. This study refers to data from Public Art in Taiwan , published by the Council for Cultural Affairs of the Executive Yuan, and uses the corresponding representative public artworks in Taipei City as survey samples. The questionnaire approach and interviews are adopted to present matching questions to the surveyed. The semantic differential approach (SD) is conducted on 36 people to investigate their image cognition. In the end, the data collected are examined and tested with the quantifying software SPSS to analyze viewers' image cognition and aesthetic factors for public art. Hopefully, the results of this study can serve as references for researchers of public art creation and design and academic studies in the future.

Keywords: physical interactions, public art, artistic street furniture, image cognition

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(528) The Influence of Operation Impresseon and Information Seeking on Web Layout

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This paper discusses how a website's layout may affect a user's operation impression, and the length of time it takes a user to seek out information on a site. In recent years, different layouts have been used in an attempt to differentiate themselves from other websites. This phenomenon is making initial navigation of websites difficult for the first time visitors to these sites. Therefore, we hypothesized that the root cause of the above-mentioned issue lies in the difference between the user friendly layouts actually in use versus layouts that users think are easy to navigate. More specifically, multiple layouts were presented to the participants, and the operation impression and the time it took users to seek out information were measured for each layout. Using the obtained data, relationships between the searching characteristics of the users and the layout suitable for those characteristics were sought in order to contribute to navigation-friendly layout designs.

Keywords: Web design, Web navigation, Layout, Usability

(253) Interactive Architecture

Extending the Kansei Engineering Approach to Real-Time Interactive Spatial Systems

SCHUELER Nora Louisa, Delft University of Technology, Netherlands

This paper will elaborate upon the term Complexity in Architecture and present interactive design strategies as a possible approach to comply with current architectural demands. User emotions being one of these demands will be discussed in connection with the need for performance driven adaptability of current architectural constructs and will be exemplified by presenting test cases in the form of student projects where evoking specific emotions is the main focus of the design. The design assignment of a SPA (Hyperbody interpretation: Sensory Performing Architecture) starting from reinterpreting the classic idea of a SPA and incorporating the interactivity into the building's behavior shall thus be presented as an applied research project. Subsequently the relation of emotions and interactive architecture will be discussed and the Kansei method will function as a possible linkage to enhance the emotive performance of interactive architecture. Ongoing research projects will give an indication of further research questions and possible interconnections of emotion design and complex interactive architectural systems.

Keywords: interactive architecture, emotive adaptive systems, real-time behavior

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(399) Aesthetics based on Synesthetic Kansei
Searching for the Mechanism of Embodiment as the Foundation of Designing

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In 'design world", there are two kinds of people. They are designers and users. From when designing began, they were communicating each other, some how. As an example, they communicate by sharing 'cognition of beauty". But we don't know exactly how does it possible. In this paper, we tried to find the foundation of communication between designers and users through simple experiments regarding 'cognition of beauty". In those experiments, we let the subjects divide a line at their will. And as a result, we find some tendencies even in that simple action, which we regard as a very primitive act of design. We are going to call embodied abilities behind act of design 'Synesthetic KANSEI".

Keywords: Synesthetic KANSEI, Embodiment, cognition of beauty, rules of beauty.

(149) The Status of Families Communication Needs in Taiwan and Discussion Over Future Interaction Design

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This study mainly discusses the status of the daily family life in different periods and the interactive communication design in Taiwan. Firstly, from six cases based on three stages including the stage, child-growing stage and mature stage, the research conducts a lifestyle interview and on-the-scene investigation via field survey and environmental observation. Preliminary findings suggested that at different stages, many factors would influence family lifestyle and interactive communication, such as children's age, whether they are full-time mothers or not, the parents' type of work and whether they are living separately or not. Parents in Taiwan focus on looking after little children during the nursery stage and the growing stage, whereas during the mature stage, they use more spreading messages when children become more independent. And based on the lifestyle and the interactive communication need of the above cases and through a scenario-oriented approach. The research proposes four notions of situation design listed as follows: refrigerator acting as an inter-medium; family members being in different areas; members at home providing assistance to the members outside; and children being in emergencies outside. Therefore, we have concluded that a design of interactive communication should include memos, messages, notes, sound identification, security, electric appliance control, also Kansei Engineering, Ubiquitous High-Tech, and related internet knowledge and skills to reach the best of interactive communication. The result of this research can provide references to the research of the design of interactive communication and the interactive products and would carry on the study.

Keywords: Family life in taiwan, Communication needs, Interaction design, Scenario design

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(418) Empirical Analysis of How Visual Properties of Texts Affect Manual Legibility

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Do you thoroughly read instruction manuals when you use newly-purchased home electronics, such as mobile phones, video recorders, digital cameras and so on? As the functions of such electronics become more and more diverse, their instruction manuals get more complicated and increase in volume. Therefore, the users tend not to read the instruction manuals carefully. In addition, to reduce the cost of printing, manual makers tend to pack all instructions in limited number of pages using small fonts and with less spacing, which makes the legibility of manuals even worse. The purpose of this research is to empirically clarify how visual properties of texts influence their legibility and to provide a quantitative guideline for designing user-friendly manuals. We manipulated four visual properties of Japanese text using Universal Design Fonts, i.e. the size of characters, the aspect ratio (height-to-width ratio) of each character, the space between lines, and the space between characters, and experimentally evaluated how these properties affect the legibility of texts. In the first experiment, we employed a conjoint method where the subjects rearranged text-written cards with different visual properties in the order of legibility. The results suggest that the character size and the character aspect ratio are the visual properties that strongly affect the text legibility. In particular, the evaluated legibility score became low when the aspect ratio (width/height) was less than 0.7 and the character size was less than 8 point. Interestingly, it was found that the subjects prefer large characters with vertically longer aspect ratio rather than small characters with the same height-to-width ratio even if the text consists of the same number of characters per fixed area. To investigate how the visual properties of text affect the legibility in more detail, we conducted further experiments where we used a rating method with a rating scale of 20 steps. The results show that the legibility is good if the space between lines relative to the character size is around 0.7, but it worsens rapidly if the space between lines becomes less than 0.4. The aspect ratio also greatly affects the legibility, i.e., most texts are illegible if the aspect ratio is less than 0.55. In conclusion, the results of the experiments suggest that if there is no restriction on spatial cost, it is recommended to use large character size (at least 10 point) with the relative line-spacing 0.7 and the aspect ratio 1.0. However, in the case when the overall space should be restricted, it is desired to use at least the character size of 7.5 point with the relative line-spacing 0.3 and the aspect ratio 0.7, in order not to impose a severe visual burden on the users.

Keywords: character size, interline spacing, letter spacing, character aspect ratio, conjoint method

(510) Content-oriented Approach to Knowledge Description of Aesthetic Experience

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Aesthetic experience is regarded as a process that comprises a sequence of mental activities. We suggest a content-oriented description method for the modeling of aesthetic experience in order to illustrate what people appreciate and how. In this article, we focus on mental processes in which human beings appreciate artworks. Our description method illustrates the flows and contents of consciousness in aesthetic appreciation. The flows of consciousness are represented in a flowchart and contents of consciousness in a task flow. Our trial to build the description of appreciation revealed that mental processes in aesthetic experience are categorized into two types by direction of focus. When a human being focuses on an artwork, s/he gains a mental representation corresponding to physical irritations. When s/he focuses on him/herself, s/he experiences an emotion corresponding to mental representation. Moreover, we discuss the requirements in kansei externalization ontology, which provides systematic knowledge of kansei externalization, and the method of construction.

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Keywords: aesthetic experience, content of consciousness, content-oriented, ontology, knowledge description

(388) A Semantic Approach to Text-based Image Retrieval Using a Lexical Ontology

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This research proposed a novel semantic approach to text-based image retrieval based on a lexical ontology called OntoRo. The approach aims to narrow down the semantic gap between visual content and the richness of human semantics by using keywords-based semantic image indexing. The approach proposed involves: (a) semantic image indexing; (b) semantic search; and (c) semantic image visualization. This paper focuses on the semantic image indexing method and implements semantic search method as the evaluation process. A new concept of Semantic DNA is introduced as an indexing method which will help to retrieve semantic results. The Semantic DNA is extracted from the existing ontological structure of OntoRo. It is the key element in this approach which will be used throughout the whole research.

Keywords: Image Retrieval, Image indexing, semantic, lexical ontology

(252) Analysis of texts' emotional content in a multidimensional space

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In this paper we focus on the task of detecting emotion in texts. Among the most employed approaches, categorical ones are mainly used for their simplicity and intuitiveness while dimensional ones, although less common, may provide more objective and accurate results. In current works, both methods often result in tagging texts with emotion labels (resulting from a segmentation of the emotional space into regions for the dimensional case). In this paper, we propose to consider another point of view: we analyse texts as point sets in an emotional multidimensional space. To that aim, we exploit a norm built up of 3000 French terms established on the basis of a psychological experience, mapping terms in a 3 dimensional space constituted of valence, activation and emotionality. Our experiments on lyrics and film dialogues show promising results despite the lack of any linguistic pre-processing. We hope this approach will lead to new ways of identifying and discriminating emotional content from texts.

Keywords: emotion mining, text analysis, affect curves, computational intelligence

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(215) A Data Mining Framework for CITARASA-Based System

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This paper introduces the data mining techniques and results that have been produced utilizing a series of customer interviews in the automotive industry following the concept of citarasa, an innovative methodology that means emotional intent in Malay. The aim of the surveys were to identify affective needs of car and truck customers and figure out how these are interpreted in design elements of vehicles. Data mining methods were deployed for the discovery of the mapping mechanism between customers' affective needs and design parameters that characterize the design elements of vehicles. The generated mechanism was then used for the provision of personalized vehicle recommendations to customers.

Keywords: Citarasa, Affective needs, Data mining, Associative Classification

(71) Kansei search for elderly care home design guidelines

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Design guidelines for elderly care homes promote concrete space elements and seldom describe how functional solutions create a holistic atmosphere even if the care home management tradition expresses emotional-cultural values such as coziness, friendliness and home likeness. Guidelines concentrate on denotative qualities fulfilling physical needs,? not on the positive atmosphere and connotative meanings referring to psychological experiences with value judgments and feelings. Care home design needs to bridge the gap between the denotative guidelines and their possible connotations for the diverse users such as staff members with the quality of care paradigm and especially residents with homely living desires. This paper describes a preliminary study in Finland in 2009 using images from existing care homes. Focus group discussions about the space images were carried out with elderly respondents, care home staff members and interior design students. Emotional responses seem to arise through analyzing specific elements and their nature providing physical, mental and social affordances and identification. Constellations of separate elements create an atmosphere of a certain category experience such as home, hotel, hospital, school, etc. and feel described by Kansei words. Holistic concept models could be set up as design guidelines for connotative, positive atmosphere constellations. This preliminary study suggests the possibility of positive care home concepts through studies of pleasurable and familiar social-cultural and emotional experience constellations and their application for the care home design solutions and service process.

Keywords: Elderly, Care homes, Connotation, Atmosphere, Interior design concepts

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(414) Human Perception of Hand Pain for Activities Common in Daily Life

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The hand is one of the essential parts of the body for carrying out Activities of Daily Living (ADLs). Individuals use their hands and fingers in everyday activities either in the workplace or at home. Hand-intensive tasks require diverse and sometimes extreme levels of exertion, depending on the action, movement or manipulation involved. Good design product especially using hand and finger should consider factors such as simplicity ease to learn, efficiency and pleasure of use and should be suitable for general application for all user categories including those with disabilities. Hence, improved understanding of hand pain is important for the study of ADLs and particular attention should be drawn to the type, cause, frequency and degree of pain. Our primary objective was to determine the level and frequency of pain in the hands and fingers during common ADLs and the associated hand actions. The actions investigated were gripping, pinching, twisting, manipulating of digits and lifting. A survey totaling 626 participants was collected using an online survey, with respondents ranging between 22 to 58 years old. 616 subjects fully completed the survey with a response rate of 98.9% with 209 (34%) male and 407 (66%) female. The result shows that gripping produced the highest frequency of pain, but twisting produced the highest degree of pain, followed by pinching. Gripping and lifting actions showed the same degree of average pain rating. Serious pain feeling is ache recording higher percentage (28% - 35%), while tender, sharp, cramp, tingling are within the same range for every action. These results and proposes further work is to improve the design, environment and method to manipulate object.

Keywords: ADLs (Activities Daily Living), Pain Feeling, Pain Rating and Gripping

(155) The Quantitative Evaluation of the Visual comfort and Discomfort Induced by Stripe and Grid Patterns

A Comparison between Migraine Patients and Normal Controls

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Migraine, a chronic headache disorder, is known to induce certain characteristic symptoms and perceptions in patients. Previous studies have reported that geometrical patterns cause visual discomfort and pattern glare; such effects are especially strong in migraine patients. On the other hand, when artists and designers use similar geometrical patterns in their works, the patterns induce good feelings. However, the comfort and discomfort caused by geometrical patterns have not been analyzed quantitatively and systematically. In the present study, we measured the comfort and discomfort induced by stripe and grid patterns in migraine patients and headache-free controls. We used two pattern components (square waves and sine waves) to examine the effect of contours on the patients. In the experiment, participants subjectively evaluated discomfort, brightness, fatigue, flicker, motion, and beauty. The results showed that all the evaluation values, except for the one for beauty, increased in both groups as the grid size decreased; moreover, the value for brightness given by the migraine patients increased by a substantial amount. Interestingly, the square waves composed of the smallest grids induced both beauty and discomfort in both participant groups. The results imply that although geometrical patterns may look beautiful, they can at the same time induce discomfort particularly in migraine patients.

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Keywords: Vision, Migraine, Geometrical Pattern, Comfort, Discomfort

(46) The Design study of Multiple Toys for Parent-Autism Children Interaction based on Sensory Integration

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Toy is an important media in child development, and it is also essential for the child with autism who has difficulties in interaction behaviors. It is very helpful that keep good interactions between parents and child with autism in a family for the autistic child's development and emotions. This research is based on the sensory integration. By orderly providing the toys corresponding to the stimulation the proprioception, the tactile, the vision, the auditory and the olfaction, we've obtained the relationship between the sensual input from different physical characters and the interaction within the family with autistic child. This research is divided into two parts which are the scheme of the experiments and the process of the experiments respectively. (1) The scheme of the experiments contains designing the experimental activities according to previous literature, recording the experimental data of "family interaction?and evaluating the results of the questionnaires of "the scale of the parents?mental feeling? The purpose of the "family interaction?is to record the degree of autistic child's concentration, and with respect to "parents?mental feeling? we evaluate the degree of voluntary participation during the autistic child playing with the designed toy. (2) The process of the experiment is mainly executed by orderly adding five stimulations within five consecutive experiments. The results of these experiments have turned out that (1) with respect to "family interaction? the degree of concentration reached the highest when the proprioception stimulation was added, and descended to the lowest when the visual stimulation was added. However, the subject's concentration gradually ascended again when the olfaction stimulation was added. (2) With respect to "parents?mental feeling? the degree of voluntary participation reached the highest when the tactile stimulation was added, but it descended to the lowest when the visual and the auditory stimulation were added. (3) With respect to the relationship between the "family interaction?and the "parents?mental feeling? when the proprioception stimulation was added, the degree of concentration was obviously higher than other variables; when the visual stimulation was added, the degree of both conditions, which are "family interaction?and "parents?mental feeling?respectively, descended, but later ascended when stimulation of the olfaction was added. This implies that we could take the sense of the olfaction as an element when designing a concentration reinforcing product.

Keywords: autism, sensory integration, toy design, interaction

(527) Evaluation of Feelings Invoked by the Rhythm Patterns of Percussive Color

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This paper discusses our listening evaluations of the affective values of different rhythm patterns produced by two types of MIDI sound. The results confirmed that affective values changed with changes in rhythm patterns. The applicability of this study to music therapy is also examined.

Keywords: Rhythm pattern, Affect, Music therapy

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(90) Influence of Textile Parameters and Ageing on Consumer Behaviour

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Textiles producers and designers need to decide on fabric parameters which can fulfil the consumer expectations. The textile consumer always has specific preferences. These preferences apply to the textile properties at the time of purchasing the textiles and also to the perception of how long lasting these properties will be. The gap between consumer behaviour and manufacturer thinking towards the textiles need to be bridged. We tried to study the influence of knitted textile material parameters on the sensory feeling of textiles. We have chosen the key textile parameters relevant to knitting i.e. Fibre type (Cellulosic or synthetic), Fibre fineness (Regular or micro fibre), Yarn Construction (Ring, Open end), Knitting Structure (Jersey, Rib or Interlock) in order to study their effect on the sensory feeling of textiles.Sensory Evaluation is performed by a panel of trained subjects (panellists) using a standard evaluation procedure. This allows the generation of a list of exhaustive sensory attributes describing fabric hand and appearance, and then the determination of relative or absolute scores for fabric samples for each sensory attribute. We also examined the change in handle of fabric with life cycle of the fabric. The change in handle of the fabric after washing is unavoidable because of strong mechanical action during washing. Principal component analysis (statistical data analysis which includes appropriate criteria) was then performed in order to make a better interpretation of the sensory data by plotting the fabric map and sensory attribute map. This work can be used as a tool for textile manufacturers to design the input parameters for knitted textiles: taking account of consumer behaviour for particular fabrics may allow the generation of better emotional response during the life cycle of apparel.

Keywords: Sensory Evaluation, Textiles, Ageing, Principal Component Analysis

(114) Consumer Behaviour towards Sustainability within Fashion

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There has been a growing general awareness of environmental and ethical issues in the last few years, and designers and retailers have recently been increasing production of clothes of a more ethical and environmentally-friendly nature in response to concern over these issues. Many discussions of consumer behaviour are assuming consistent and rational behaviour amongst individual consumers or specific groups and a reasonable assumption would be that consumers are demanding such clothes as a result of their changing attitudes. This paper illustrates with a study of consumer attitudes towards sustainability and ethical consumption in textiles, the inconsistency within a group, in an individual and between peoples' stated beliefs and their actual behaviour. In this study, 14 people were interviewed, over a 100 people responded to a questionnaire and the responses were analysed. Clothes are an important part of consumers' lives and are linked with their own expression of individuality, their needs, desires and self-esteem. Generally style was rated to be more important leading to people holding onto cherished pieces of clothing for many years. For consumers, purchasing clothing can be a complicated matter with many factors affecting purchasing decisions; the colour, design, price, fit, etc leaving the issues of sustainability usually the least of their requirements. An important consideration for many was how people are judged by their clothing choices. Despite the relatively small sample, consumers in this study are inconsistent, with their purchasing decisions not always reflecting their attitudes. The study revealed that despite a high awareness of ecological issues most customers were very unaware of the environmental impacts of the production of garments, the mass transportation involved and their own individual use. The unresolved challenge that needs to be tackled involves seeking to incorporate ecological issues into clothing whilst recognizing the emotional and symbolic needs of consumers.

Keywords: Apparel, Behaviour Observation, Emotional Behaviour, Individual, Subconscious

(261) The Application of Numerical Definition-Based Systematic Approach in Form of High-heel Shoes to Image Perception

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High-heel shoes are product of human civilization. With the advancement of consumers' requirements and aesthetic variation, high-heel shoes not only provide function-based fitness but the emotional response in personal image perception, especially in different gender perception. Further, Tom Ford talked 'There is no sexy woman without high-heels.' Hence, there is a significant relationship between high-heels form and consumers' perception. The study focus on high-heels form, according to Kansei engineering as a foundation and employ qualitative and quantitative analyses to define the style of the product. Therefore, different sensational image products of the design principal will emerge. Firstly, we propose 30 high-heel shoes samples constructed by 2D computer software; and then 4 representative sensuous words¡Xsweet, elegant, hot and fashionable were identified through approaches of questionnaire analysis, expert interview, and the KJ method. In addition to apply Numerical Definition-based Systematic Approach (NDSA) and element factors to define high heels form. Finally, using quantitative theory type I and multiple linear regression analysis to analyze high heels form between form elements and image words to obtain the principle of design is used. The results from multiple linear regression analysis indicated that 'height' is the most influence on participants' image perception. On the other hand, the relation between each element factors and form image was also determined through analysis of quantitative theory type I. And through the weighing level of different pairs of words, we found out that the major influence factor for form image lies in the thickness of heel, secondly the rear heel, and then the opening of shoes and the last is shoe tongue. This study combined with conclusion for corresponding relations between sensuous perception and high heels form, in order to establish a high-heel design method for designers to refer to.

Keywords: NDSA, image perception, Kansei Engineering, high heels, sensuous words

(159) Flight attendant uniform concept preference study using kansei Ergonomics

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Flight attendants are required to wear a uniform to work. The image then projected by this uniform is highly important; as well as, the way it makes them feel while wearing it. Unfortunately, the wearers' perception, satisfaction and preferences towards their uniforms are not always considered within the design process of creating these clothes. Studies, in this field, have demonstrated that there are two main sources of dissatisfaction of flight attendants own uniforms: fit and fabrics. The objective of this study is to evaluate the flight attendants visual concept preferences in the design of new uniforms. We used kansei ergonomics methodology to evaluate the perceptions of the potential uniform users regarding six new flight attendant uniform concepts. 103 female flight attendants from different airlines operating in Portugal answered a kansei questionnaire with 13 questions about each uniform concept. A factor analysis was applied to describe the underlying structure of the 13 variables, for each uniform concept. The results suggest that it should be considered between 2 or 3 factors for each concept. The factors with the highest eigenvalues were related with issues about Image/Look, Movement functionality, Identification and being Professional. The results relate the concepts with the suggested factors, according with what designers' envision or what the design projects demands; the designers can then redraw new uniform proposals closer to the preferred user factors. This paper demonstrates that kansei ergonomics can be a useful work methodology in the development of flight attendant uniforms in a user centered design perspective.

Keywords: flight attendant uniform, kansei ergonomics, kansei engineering

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(314) Brand identity adjustable to redesign by using similarity matching for lady fashion shoes

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Presently, fashion products in Asian are highly interested. A lady fashion shoes is one of the biggest markets in Bangkok, Thailand. There are both local brands and import brands. However, customers' emotion is difference and variance depended on a place and its environment. This paper proposes design methodology for (re)design new product in response to the variety of customers' perception. The design methodology has 2 steps. The first step, aims to explore brand identity and product components with express their identity. The second step, aims to (re)design new product in response to customers' perception. The data collection is analyzed by PCA technique that is used to explore brand identity. Similarity matching is used to retrieve previous shoe components from database to (re)design new product. The design methodology will help designers adjusting the product form, aesthetic, semantic and symbolic aspects of cognitive in response to customers' perception.

Keywords: brand identity, fashion lady shoes, customers' perception, (re)design, similarity matching

(138) A Study of Product Preference and Mental-Distance Based on Gender Schema

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In recent years, because of the influence of sweeping social, economic, and technical changes, sex roles and sex stereotypes have changed dramatically. Relationship between gender orientation of product and consumer's gender is becoming indefinite. Product with gendered form might not only attract gender-congruent groups. There might be potential consumers with incongruent gender, but congruent gender schema to the product. On the other hand, except the effect of product preference, the influence called mental-distance that between consumer and product might affect consumer's choice. The relationship of mental-distance and product preference is also one of the researching directions. This research uses Sex Role Scale to divide 170 subjects into 2(gender) × 4(gender schema) =8 groups, and uses Stratified Random Sampling Method to select 68 subjects for joining the Preference and Mental-Distance Test for gendered-product. Bivariance Correlation Analysis, T-Test, ANOVA Analysis, and LSD Multiple Comparisons would be used to analyze the research data. Research result shows: (1) Reverse correlation existed between product preference and mental-distance. In other words, product with familiar image to self-image would make people intimate and raise preference for the product easily. (2) Correlations between product preference and mental-distance are different because of different sex roles. 3) Research builds the relationship between gender and gendered-product, concluding the result into relationship charts. (4) Based on gender schema theory, research revises the dilemmas of gender stereotype design, provides designers a guideline for the gender orientation of product form.

Keywords: Product Preference, Gender Schema, Mental-Distance, Product Form

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(471) Computational models of empathy and emotional entrainment: toward novel approaches to KANSEI Information Processing

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The study of human intended and unintended interpersonal co-ordination is one of the more interesting and challenging topics in the psychological and behavioral sciences, and is receiving an increasing interest from the ICT research communities. The objective here is to develop more natural and intelligent interfaces, with a focus on non-verbal communication, embodiment, and enaction [1], and, from another perspective, on KANSEI Information Processing [2], [3]. In natural sciences the co-ordination phenomenon is better-known as entrainment. In this paper we present research scenario to study and measure entrainment in small groups of people from the KANSEI perspective. In our approach, participants in the experiment are modeled as components of a complex system and entrainment is measured starting from the computation of an index of phase synchronization. The computational model for real-time extraction of such phase synchronization index from a group of people is also discussed. We adopted a string quartet musical performance as test-bed. We designed an experiment in which we recorded synchronized multimodal features (movement, audio, physiological signals) aiming at measuring entrainment in different conditions. Preliminary results from this research include a software library based on the EyesWeb XMI platform for real-time extraction of non-verbal social signals.

Keywords: entrainment, synchronization, emotion, joint music activity, multimodal interaction

(190) Design of Scents Suited with User's Kansei using Interactive Evolutionary Computation

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This paper proposes an effective method to design scents suited with a user's Kansei using the interactive evolutionary computation (IEC). Effects of the scents are used for various purposes, and ready-made scents are often used. It is expected that more effective results can be achieved if we use the scents suited with the user's Kansei. Recent progress of technology enables us to create our favorite scents by blending several source scents. With 'Aromageur', one of the such devices, a user can create scents by specifying a favorite blending ratio. With these devices, however, the user is required to optimize the blended ratio of the scents suited with their Kansei by try and error. The aim of this paper is to propose the method to optimize the blended ratio without such a load. We adopt IEC technique for the optimization. In the proposed method, instead of adjusting the blended ratio by the user manually, the user just evaluates and scores the blended scents. The blended ratio corresponding to each scent is regarded as an individual in the IEC algorithm. The algorithm imitates the evolution of creatures, and individuals having higher scores are tended to be selected and produce their offspring. It is expected that IEC finds the blended ratio of scents best or better suited with the user's Kansei after several generations. In this paper, we developed the IEC system and investigated the efficacy of the system through smelling experiment.

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Keywords: Scent, Aromatherapy, Interactive Evolutionary Computation, Kansei

(182) A Tentative Model for Kansei Processing
Projection Model of Kansei Experience

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Although there are various definitions for the term 'Kansei', it seems to be generally accepted that Kansei is related to both of the cognitive process and the emotional process. This paper proposes a tentative model for Kansei processing by combining the cognitive process model and the emotional process model. Regarding the cognitive process, there are many models that have been proposed since late 1950's when the information processing approach was introduced to psychology. Since then, there are famous models proposed by Broadbent (1958), Atkinson and Shiffrin (1968), Haber and Hershenson (1973), Baddeley (1974), Treisman (1980), Card, Moran and Newell (1983), Norman (1990), Kieras, Meyer, Mueller and Seymour (1999), and May (2006). Major and common features of these models include; (1) the human being is regarded as the information processor, (2) there is the data flow and the control flow, (3) the model starts from the sensory input and ends with the verbal/motor output, (4) the initial step is the sensory system including the eye, the ear and other sensory input channel, (5) the next step is the sensory information storage that is sometime called VIS (Visual Information Storage) or AIS (Auditory Information Storage), (6) the next step is called the STM (Short Term Memory) and is sometimes called as the WM (Working Memory) with the visual information loop and auditory information loop that depicts the information from VIS and AIS and also interact with the LTM (Long Term Memory) that stores the information in the real like form of event (the episodic memory) and the abstract form (the semantic memory), (7) there is a information control process that is similar to the CPU of the computer and controls the data flow among VIS, AIS, STM and LTM, (8) finally the output information is conveyed from STM to the output buffer, then to the output motor systems including the mouse, the finger, etc. Regarding the emotional process, traditional models concerned with the structure of emotion such as the one proposed by Wundt (1902), Schlosberg (1952), Plutchik (1962) and Russel (1980). But the information processing model of cognition influenced the research of emotion and formulated the emotional processing models such as by Roseman (1984), LeDoux (1986), Kaiho (1991), Forgas (1995), Ohira (1997), Takemura (1997), Power and Dalgleish (1997), Kovecses (2002), Kitamura (2003), and Mogg and Bradley (2005). Compared to the information processing model of cognition, the model of emotions differs from one to another very much. But the important point among some of them is the notion of the valence. The model here is proposed by combining both of the cognitive model and the emotional model. The emotional process contains the extrinsic emotion and the intrinsic emotion where the former interacts with the STM and the STM put the valence to the information unit of memory (the event in the episodic memory and the item in the semantic memory). For example, the matching process for the recent event in STM and the stored pair of event valence let people feel some emotion (negative or positive), and the Kansei will thus be experienced.

Keywords: Cognition, Emotion, Information Processing, Model of Kansei

(453) Human resource management and emotional intelligence

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Emotional intelligence (EI) is the top of the iceberg in a company, because of the human resources whose visibility and unseen face, may lead the organization to success or failure according to the way they are managed. The influence of EI can be found in every function of the company, as a company is a living organization. Besides, in the personnel function this influence is intrinsic, present and it generates new reactions. Activities in human resources management (HRM), starting with the recruiting, selection, hiring, integration process and continuing with motivation, human resources development, and implicitly career development, evaluation and rewarding is involving multiple relationships and different levels of EI which determin the performance obtained during work. This paper is focused on developing several aspects regarding the relationship between EI and HRM. This approach is among the first researches of EI in Romanian organizations and it identifies the level of EI and the main emotions showed by the top managers of a national company.

Keywords: emotional intelligence, emotions, human resources

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(355) Introducing Multimodal Sequential Emotional Expressions for Virtual Characters

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In this paper we present a system which allows embodied conversational agent to display multimodal sequential expressions. Recent studies show that several emotions are expressed by a set of different nonverbal behaviors which include different modalities: facial expressions, head and gaze movements, gestures, torso movements and posture. Multimodal sequential expressions of emotions may be composed of nonverbal behaviors displayed simultaneously over different modalities, of a sequence of behaviors or of expressions that change dynamically within one modality. This paper presents, from the annotation to the synthesis of the behavior, the process of multimodal sequential expressions generation as well as the results of the evaluation of our system.

Keywords: virtual characters, emotional expressions, multimodality

(447) Designing Companions with Kansei

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Companions represent a new form of human-computer interaction. They are the next generation of Embodied Conversational Agents (ECA) with a robust dialogue capability. ECAs alter the interaction to a more natural setting: face-to-face communication and because of the anthropomorphic communication this creates, Companions are also expected to be affective interfaces. Empathy is an essential component of the interaction between users and Companions. The vision of Companions is that they are changing interactions between humans and systems into relationships. Companions represent a particular challenge for the design research because of the emergent technologies that they are endowed with and because of the fact that users' response to Companions is unknown. The key elements of these Companions which impact the user experience need to be identified, particularly the global users' perception towards these Companions as interfaces. The methodology of the design process of Companions is inspired by the concept of 'Kansei' and the methods of 'Kansei Engineering', which translate consumer perceptions into design attributes. Analyzing results provide an interesting insight into the societal impact and the new relationships people want to develop with Companions as a new interface involving emergent technology. Firstly, results reveal that users need time to speak about these emergent technologies, secondly, they yearn a relationship with their own Companions which is somewhere between the human relationship and object relationship. The semantic of these artefacts seem to be emerging; as a result users need to make use of metaphors to qualify these Companions. Moreover, people drew a singular approach to how the 'Companion's hierarchy' could work illustrating their expectations of the 'technology promises'.

Keywords: Kansei Design, Design research, Affective Interfaces, Intelligent Agents

(417) On Listeners' and Speakers' Gender-Dependent Features of Auditory Impressions of Emotional Speech in Various Degrees

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This paper compares the prosodic features of various types and degrees of emotional expressions in Japanese speech based on the auditory impressions between the two genders of speakers as well as listeners. The speech samples consist of 'neutral' speech as well as speech with three types of emotions ('anger', 'joy', and 'sadness') of three degrees ('light', 'medium', and 'strong'). Prosodic-feature parameters are speech rate and F0 parameters. A listening test is conducted using 144-word speech samples uttered by two radio actors and two radio actresses. We use 25 male and 50 female subjects at the ages of 19-21 years old. We then analyze the features of prosodic parameters based on the emotional speech classified according to the auditory impressions of the subjects. Analysis results suggest that prosodic features that identify their emotions and degrees are not only speakers' gender-dependent, but also listeners' gender-dependent.

Keywords: emotional expression, prosody, auditory impression, listening test, gender

(230) Building credible agents: behaviour influenced by personality and emotional traits

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Convincing conversational agents need to have a coherent set of behavioural responses that can be interpreted by a human observer as being indicative of a personality. However our knowledge about these issues has been somewhat limited. This paper proposes that the way in which personality dimensions affect various attributes of animated characters should reflect the similar processes in humans upon which they are modelled. Our work is part of the EU project CALLAS, which aims to provide a multimodal system of conversational agents, or Sensitive Artificial Listeners (SAL). These virtual agents are designed to sustain realistic interaction with human users, despite having limited verbal skills. Four psychologically different characters (SAL agents) have been created to elicit different types of emotion - each employing individual dialogue strategies, and displaying uniquely different responsive reactions. We first outline differing theories of personality and consider the benefits of adopting Eysenck's three-dimensional approach. We explain how Eysenck's biological model could to some extent direct and justify specific response patterns of behaviour in developing agents' characters. Accurate judgments of personality based on behavioural cues obviously depend on behavioural correlates – the existence of associations between these cues and the personality parameters. In considering how to map these connections and translate stable traits into personality-dependent actions, we draw on Individual Differences research in psychology to demonstrate how personality traits influence behaviour, and to explore the links between impressions of personality and verbal/nonverbal behaviour. The SAL agents have been implemented in our virtual 3D agent system. To capture their behavioural and communicational differences we need to define the general behaviour tendency for each of them. This tendency, also called baseline, is characterized by the agents' modality preference and the expressivity on each modality. 4 baselines are thus defined. The system architecture is as follows. A user sits in front of a computer screen where one of the agents is displayed. The user selects one character to start interacting with. She can change of interlocutor at any moment. In the interaction with human users, the agent's main role consists in maintaining the interaction with the human users and bringing them to a similar emotion state as it. A video camera and a microphone record user's movements and voice quality. This information is used in our system to determine the agent's behaviour while listening to the user. The agent can perform non verbal signals to show how it is reacting to the user's speech, if it is listening, understanding, agreeing and so on. In the full paper we will describe in more details how we kept a computationally appropriate level of complexity to model personality in virtual agent and how personality affects behaviours. We also introduce the SAL architecture where we detail how personality acts on the behaviour characteristic of the virtual agent and on their communicative styles, in particular when being a listener.

Keywords: Personality traits, Eysenck, emotional traits, virtual agents

(411) Spectral-Tilt Features of Emotional Speech -Research on Emotional-Speech Synthesis Based on Voice-Quality Conversion-

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This paper describes the analysis of the voice-quality features of "anger", "joy", etc. depending on the degree of the emotion for expressions in Japanese speech. Among voice-quality features, we turn to the tilt of speech spectra. The analysis results show that these spectral-tilt quantities are emotion-dependent, i.e., the spectral-tilt quantities for "anger" as well as "joy" increase significantly as the degree of each emotion becomes greater. This confirms that the voice quality changes to the one whose higher frequency band is more emphasized as the degrees of "anger" and "joy" increase.

Keywords: speech synthesis, emotional expression, voice quality, spectral tilt

(20) Relative Importance of Design and Usability of Cell Phone in Terms of Age and Gender

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Generally, it is believed that high-tech devices such as the cell phone are not used frequently by the senior people. But actually, the number of the senior people who use the cell phone is not so small. The fact is that they don't use it effectively and efficiently. In this paper, authors focused on the process of purchasing and using the cell phone in detail. The result of the questionnaire research showed that there is a difference between the young people and the senior people in the relative importance of the cell phone when they purchase it. More specifically, when choosing the cell phone, the young people tend to focus on the Kansei or the design aspects of the cell phone while the senior people tend to focus on the usability. In addition, interview research revealed that there are social factors including the family structure, the residence type, and the relationship with children and mental factors including the sense of weakness and the general lack of activeness as well as the physical change due to their age as the background factors for the characteristic behavioral pattern of the senior people to emphasize the usability. But there were also positive opinions among senior people that they would put emphasis on the design if there is a sufficient level of usability.

Keywords: senior people, cell phone, usability, design, qualitative approach

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(85) Exploring Kansei Attributes of the Emotional Design Preferences on Children's Wear in Malaysia

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When designers begin to create new product, they need to explore on new shapes or elements that represent the consumer preferences which will account not only the tangible demands but also the subjective preferences. In this study, attention is given to the design of female children's clothing in the context of urban wear from the age of 1 till 6 years old in Malaysia by using Kansei Engineering to investigate the emotional design preferences of the perceived images or objects of children's clothing and study how these personal preferences work to the desirable products. This paper reports the initial investigation of the factor of Kansei as part of our objective to develop a web based intelligent system that account for emotional acquisition on the clothing design attributes. We contend that the emotional desire elicited by the consumer is believed to influence what constitute quality design and the decision to purchase a product thus become loyal to the products. The paper presents the results of an exploratory study to identify the significant Kansei words, which influence the emotional preferences on the design of children's clothing from the consumers. With the use of Factor Analysis, this study have found 5 significant factors of Kansei, which consists of well-design, active & modern, energetic, appealing and exclusive, that structure from consumer's Kansei responses. This study concludes that these factors become the important concept to the design of children's wear that evoke consumer's sensibility and psychological feelings of pleasurable and desirable.

Keywords: Children's clothing, Kansei Engineering, Factor Analysis, Kansei Words, Intelligent Web based Systems, Emotional Design

(109) The Wall Murals Design Evaluation from the Perspective of Plant Visual Graphics

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Indoor plants bring people a lot of positive effects like heightening the positive emotions, raising attention, improving health and other effects. If we were to find out the proper mental element of plant visual graphics for people, they would bring users a banquet in mind and improve the aesthetic sensibilities. This research aimed to the user evaluation of different shape, color and technique of expression plant graphics. The basic plant visual graphics characteristics included line, shape, density, color, texture and other characteristics. Among them, line created shape and texture, the relations between was closely linked. For this reason, the experiment samples of plant graphics was taken by “circle?shape common arbor tree in Taiwan and technique of expression were “simple drawing and geometric drawing,?then did experiment with another variable of color changing. The experiment subjects were divided into two groups, designers (interior, landscape, commercial and other designers) and users, did experiment in a real space for letting them have the feelings of virtual situation. The evaluation items were natural, joyful, active, relaxed, fresh, vital, comfortable and like. The experiment results showed that “circle?tree shape’s “simple drawing and green?visual graphics received high evaluation and “like?was an important key point in evaluation. We hoped to provide interior space a design guideline and a better environment for users?mental needs.

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Keywords: Visual Graphics, Evaluation, Wall Murals Design

(401) How Different Browsing Contents Affect Viewer's Attention on Internet Advertising

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The effect of internet advertising has been a controversial issue, especially on the topic of how to effectively draw more attention from internet users. According to traditional attention theory, we know people pay lesser attention on other objects if the main browsing contents occupy more of the viewer's mental resources. Therefore, we know different browsing contents should have different influences on users' attention. On the other hand, the 'Banner Blindness' effect makes viewers naturally overlook the advertising based on their previous experience. In view of these complicated factors for internet advertising, verifying the different influences of the browsing contents on advertising attention is the main goal of this study. Great amounts of previous studies relevant to internet advertising focused on the advertisement itself, like the form, color, size and location. However, this study put focus on how the browsing contents and the webpage structure influence the viewer's attention on banner advertising. This research tested four common types of browsing contents on the Internet: (1) text-based webpage; (2) text-picture mixed webpage; (3) picture-based webpage; and (4) video-based webpage. This study hopes to provide valuable information for matching advertising with viewing tasks that will stimulate the most user attention.

Keywords: Attention, Internet Advertising, Banner Blindness, viewing tasks

(173) Effects of Lightness Contrast and Image Size on KANSEI Evaluation of Photographic Images

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The purpose of this study is to clarify the effects of the lightness of main object (Lt), the lightness of background (Lb), and the lightness contrast (|Lt-Lb|/Lav, Lav is the average lightness of image), upon observers' KANSEI impression, and further to investigate their relation to the screen size. Seventeen test images of different lightness contrast were prepared not by using image processing but by manipulating the lighting condition in the photography. Four different image sizes, 7, 14, 29 and 57inches diagonal, were examined. Unipolar scales method using 22 adjectives was utilized for KANSEI evaluation of test images. Results showed that adjectives were divided into three groups. Rating score of the first group changes markedly with the lightness contrast, that of the second group varies with the image size, and that of the third group changes with both the lightness contrast and image size. Three factors were extracted by factor analysis. First factor, called KANSEI factor is described by linear transform of the Lt and image size fairly well, indicating that not only the lightness contrast but also the lightness of main object is important factor for KANSEI evaluation.

Keywords: KANSEI evaluation, photography, lightness contrast, image size, factor analysis, multiple regression analysis

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(346) Defining Street, Designing Street, Experiencing Street: Primordial Values of a Successful Street

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The public street affords a significant degree of accessibility: physical, intellectual, intentional, emotional, etc. Different agenda, all prodding the corpus-agora transactively, collide in such a public space. Some agenda seem to be sourced in more fundamental origins of personal, collective or environmental being. We refer to those as primordial. The following are proposed, among others, as primordial qualities, conditions, impulses or contingencies that augment the street as “great” public place: (i) The street exists as matrix, (ii) it affords freedom as a constitutive, (iii) it embeds memory as a constitutive, (iv) it engenders dissolution of oppositions, (v) it exists as a site for consumption, (vi) it balances invented space in tension, (vii) it is underpinned by a subtext of morality. These articulations elaborate or extend our paradigm of the street. In such definitional practice, we derive valuable insights about phenomena, are armed to re-interrogate them and broaden our capacity about them. Lessons concerning impulses that might be fundamentally powerful about inhabitation of one kind of space also instruct us about creating other personal or collective spaces.

Keywords: consumption, encounter, Internet, public space, street

(208) Cognitive measurements for the Repertory Grid Technique: assuring quality in subjective experience explorations

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Subjective experience gathering techniques based in post-modern psychological explorations mainly obtain subjective, qualitative information that can be used for inspiration purposes. However, quantitative information can also be extracted. The Repertory Grid Technique (RGT) generates qualitative insights about user experience which are related to data that can be analyzed with different statistical techniques like cluster analysis, multidimensional scaling, principal component analysis for product benchmarking, consumer preference and requirement analysis. This paper goes further by analyzing the information acquired with the RGT with cognitive measures from Constructivist psychology [Botella & Feixas 1998]. Summarizing the way in which interviewees construe their perspectives by means of several indices increases the analysis potential of the RGT. This approach makes it possible to provide information to assure not only the quality of the product (measures about consumer preference), but also the quality of the users' mental models (measures about consumer response). The selection of these psychological indexes is based on the applied value of the measurements and the support found in psychological literature. In the field of analyzing users' subjective experience information, these measures have to be seen as summary information that can be used to make comparisons between different participants and different products: • Consumer construction of product preference is one of the most important concepts of the decision-making process. Psychological indexes can be used to compare attitudes toward products developed through direct experience or from secondary sources such as advertisements or public buzz. • Cognitive complexity profiles, based on integration and consistency indexes, can be used to compare the quality and reliability (predictive power) of the consumer response from different participants. Complexity and Simplicity profiles are more reliable than Chaotic and Fragmentation profiles because their construction is more consistent and integrated. Different examples will be given to illustrate the value of these measurements to validate consumers' information processing system using the RGT. These examples are taken from previous design projects about electronic kitchen appliances.

Keywords: Repertory grid, cognitive indexes, subjective experience, consumer response, constructivist psychology

(105) Building relevant contexts to design experiences

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In advanced phase of design, it is essential to anticipate consumers' expectations. But this information should not restrain designer's creativity, and should encourage innovation. By basing us on Kansei engineering, sensory metrology and experience design, we built an exploratory tool to collect users' sensory trends and their cognitive impact. Two experiments were led: an analytical approach on the sound dimension (Sound Trends Research, not presented here [1]) and a synthetic approach on four senses (smell, sight, touch, hearing). Results are communicated to designers, but lately this methodology could be spread to the whole process of experience design. Introduction It is crucial for designers to get relevant inputs from customers and to anticipate at best their expectations. The aim of this paper is to provide designers an accurate framework, built from userï¿½s emotions, feelings, desires, and moreover experience that enable both creativity and understanding of people requirements. Designing experience implies - to take into account new concerns, related to every human sensory inputs - to understand the emotions generated - to consider the whole as a coherent experience. Research Objective The research objective is to propose new inputs for designing experiences. As a case study, we will work on a sensory room that will enable us to test trends among customers, or even to create new trends. In doing so, we expect to obtain more insight on customerï¿½s expectations. What sensory elements do they prefer for a particular experience? What can new sensory combinations evoke? This will later provide a good background for designers to create new experiences. We will discuss the five following hypotheses. Concerning sensory evaluation: H1. People build sensory profiles in a common direction H2. During an exploratory phase, people are more used to work with some sensory modalities than others. Concerning semantics and cognitive process: H3. Sensory modalities do not play at the same level in the userï¿½s cognitive process and remembrance. Some sensory properties lead to different type of emotions, associations, or lexicon designation. Concerning emotions and hedonist attributes: H4. There are specific objective properties that correspond to subjective choices. H5. It is possible to find sensory links between modalities (i.e. a kind of sound lead to a kind of image or materialï¿½). Those sensory links are related to specific emotions or hedonist experience. Method From a predefined targeted product (or concept, or global experience), an expert panel selects a set of images, materials, sounds and odors, extracts some objective properties and assess each sample. Then they set up questions, statements so as a non-expert panel can manipulate those samples and create combinations. A specific tool, with physical samples and digital application, enhance the experiment. After this experimentation, participants are individually interviewed so as to know the conscious reasons and motivations of their choices. Results The sensory preferences will be linked to objectives properties and then presented to designers, so as to provide an ï¿½Kansei briefï¿½ along with the classical ï¿½marketing briefï¿½.

Keywords: advanced phase design process, experience design, emotional design, Kansei engineering, co-creation

(372) A Hypothesis to Establish Platforms for Design Management Focused on Designing User Experiences

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After the World War II in-house design organizations were established in the major manufacturing companies in Japanese electronics and automotive industries where design function for product (hardware) was mainly featured. Since then design functions such as package design, CI design, communication design, GUI design, web design, solution design, sustainable design or universal design were added over a period of time, while increased purpose and item of design have promoted specialization and subdivision in the area of design. However, it is difficult for us to observe well established platforms for consistent and integrated design management system in the process. Rather confusion in management has been often seen. In the research we have redefined the objectives and functions of design from the viewpoint of 'designing items that users can or should experience' from the first contact to disposal of provided and used goods or services, and suggest a hypothesis to establish desirable platforms for design management. We expect the result of research will help to create a basic thought and specific methodologies that design management can achieve improvement of creativity and productivity in the activities resulting innovation.

Keywords: In-house Design Organization, Holistic Design, Platform for Design Management

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(512) Creating Customer Experience and Product Innovation at Shinzaburo Hanpu in the Regionality of Kyoto

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There is the new company Ichizawa Hanpu Kougyo in Kyoto, which happened the house disturbance. As a result, a new brand called Shinzaburo Hanpu was born. Though it is the manufacturing maker having only a channel in Kyoto, the popularity is a national scale. So, we have thought that it makes for the elaborate fabrication of this company to create the customer value with a sincere posture for the customer and a posture for manufacturing. This study aims to analyze the essential of Shinzaburo Hanpu brand from the perspective of the relation between its product innovation competence, customer experience and innovation, based on the viewpoint that there is the essence of manufacturing for Former Ichizawa Hanpu Kougyo and Ichizawa Shinzaburo Hanpu in Mr. Shinzaburo Ichizawa. In Shinzaburo Hanpu case, we have examined its relation to build customer experience using strategic experience modules, the five customer experiences management frameworks and the innovation analysis in the regionality of Kyoto.

Keywords: Customer Experience, Elaborate Fabrication, Innovation, Kyoto, Shinzaburo Hanpu

(521) Modeling Customer Preferences for Commodities by Behavior Log Analysis with Ubiquitous Sensing

Modeling Customer Preferences for Commodities by Behavior Log Analysis with Ubiquitous Sensing

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We have been developing methods for modeling customer preferences for commodities. Here, we propose an active sensing method that observes unconscious and natural reactions to information dynamically and calmly provided by the system, as well as a passive sensing method that observes customer's long-term behavior via logs taken by ubiquitous sensors. We evaluated these methods in terms of both their accuracy and the duration of modeling.

Keywords: Ubiquitous Sensing, Behavior log, Passive sensing method, Active sensing method

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(45) Effects of package images on taste perceptions for fruit juices.

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This study investigated how congruent and incongruent images attached to the juice packages influence taste evaluations. 42 subjects were divided into 2 groups. One group rated taste of juices that congruent images were attached to, and another rated what incongruent images were attached to. The subjects rated their actual palatability, goodness of odor, sweetness, bitterness, sourness, density, freshness and artificial of 6 juice samples. 3 samples were attached 3 images which randomly selected from 12 images within one condition, and another was attached 3 scrambled images of these images. Congruent images influenced goodness of odor, and incongruent images influenced freshness and artificial. These data shows that images attached to the juice packages influence taste evaluations.

Keywords: Package, Labeling, Images, Taste, Congruency

(101) Simultaneous Evaluation of Fragrance and Picture Using Kansei Parameter Method

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The language is a most typical means to impart information, but it is considered that information expressed in the word influenced on knowledge, intelligence and thinking. Therefore, it is difficult to evaluate the fragrances, scenic shots and portraits in the same category space that was composed by SD method. This paper describes a technique for equally evaluating the fragrances, scenic shots and portraits. These objects evaluated by KANSEI-parameter (KP) method. As a result of principal component analysis and cluster analysis, it is shown that KP method is useful as a mean to collect the intuitive information of the objects. Also, it is suggested that scatter plot of component scores can be used for sharing impression of the objects.

Keywords: Fragrance, KANSEI-parameter, KANSEI information

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(529) Modeling the Sense of Familiarity among People in Mutual Teaching and Application of the Model to an E-Learning Service

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Sense of familiarity among people is an important factor in mutual teaching. We propose a method of modeling this sense to support social communication in campus communities. We applied this method in finding familiar tutors to assist a specific student.

Keywords: Sense of Familiarity, Modeling, Exchange support

(517) Feeling Impression and Quantities Accompanying Calculation of Fluctuation in Sound Signal

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This paper describes an investigation result as to how the audio signal (i.e., sound and music) gives feeling impression to us and how the impression changes, depending on the distribution of power spectrum in Fourier domain of the audio input signal. In this investigation, we use three kinds of parameters accompanying the calculation of the signals' fluctuation degree. Then we examine the relationship between the parameters and affective impression, by using questionnaire survey. And also, from the viewpoint of feeling impression, we try to classify the sound signal by the values of three kinds of parameters.

Keywords: Sound processing, fluctuation value, sum of squared errors, regression analysis, affective impression

2010

(51) A New Share of Customer Preference Model that Integrates Brand Effect

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The special role that brand plays in consumer preference is analysed through customer-based brand equity. Customer-based brand equity occurs when the consumer has positive strong associations in memory, like positive emotions. Indeed, the qualifying role of the brand on product qualities leads to distortions in consumers' viewpoints. These effects of distortion are known as "brand-effect". The customer-based brand equity cannot be estimated directly with a compensatory linear model such as conjoint analysis. Different solutions were proposed to estimate customer-based brand equity directly (Srinivasan, 1979; Park and Srinivasan, 1994; Jourdan, 2002). The approach of Park and Srinivasan (1994) is the most important reference. For these authors customer-based brand equity is considered as the difference between the subjective preference (with brand) and the objective preference (without brand). Jourdan (2002) demonstrates that the calculation of differences in utilities proposed by Park and Srinivasan (1994) includes an error term that is inherent to their method. Jourdan proposed a new two-step approach that improves the results of Park and Srinivasan. It is discussed in this article why Jourdan's approach can have biased results. A new methodological solution based on the Jourdan's two-step approach is proposed. Unlike Jourdan, customer-based brand equity is estimated as a latent variable: it articulates conjointly rating-based conjoint analysis and structural equation modelling. It is mathematically demonstrated why this approach improves the Jourdan's one to estimate customer-based brand utility. The customer's utilities at different profiles can be inputed into buyer-choice simulators to predict share of preferences. With rating-based conjoint analysis, the common probabilistic predictive models suffer from the independence of irrelevant alternative problem because they are unable to handle product similarity. This article discuss about a new probabilistic model, called RFC-BOLSE. It is mathematically demonstrated why the RFC-BOLSE model gives reliable estimations of the share of preferences with rating-based conjoint analysis. The two step rating-based conjoint analysis gives estimations of customer-based brand equities and of products utilities in the same scale. So, it is possible to estimate global utility for each profile, which is the sum of profile utility without brand and the utility of the customer-based brand equity. These global utilities can be inputed into the RFC-BOLSE simulator. The major purpose of this article is the development of this new probabilistic model that takes into account objective utilities of products (estimated by a rating-based conjoint analysis) and customer-based brand equity (estimated as latent variable based on two-step rating-based conjoint analysis). The mathematical formulate of the reliability of these estimations are presented. A case study illustrates our purpose. Finally, it is presented how our approach can provide a tool to drive brand image on share of preferences. For example positives brand emotions can modify brand equity. These emotions can be introduced as latent dimensions relied to the brand-equity dimension. Their influences on brand equity would be estimated in term of share of preference by RFC-BOLSE.

Keywords: Rating-based conjoint analysis, brand effect, share of preference, structural equation modeling, randomized first choice

(320) How do we evaluate the reliability of the advertisements in the internet and magazines? Trust vs. Assurance.

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We might evaluate the reliability of the internet and magazine advertisements in different ways even if they contain the same content. The purpose of the present study was to examine how we evaluate the reliability of the internet and magazine advertisements, based on the theory of " trust vs. assurance" (Yamagishi 1998). According to Yamagishi (1998), trust implies acquiring a good thing from a mixture of good and bad things under uncertainty and risk. Here, trust does not mean " believing blindly" but something that requires examination and exploration. Assurance, on the other hand, is a situation where there is no uncertainty and risk. Interestingly, assurance destroys trust: when we think that there is assurance, we assume that there are no risks. Thus, we stop further examination on which trust is based. In this regard, we hypothesized that our relationship with the internet is based on trust, whereas our relationship with magazines is based on assurance. The internet transmits both useful and harmful information to us, and we need to check the information carefully. In magazines, however, information is checked by editors and publishers, and if their information is wrong, the magazine can be discontinued. In the present study, we conducted a web-based survey with 300 consumers. In the questionnaire, we first asked them to write a name of their favorite web site and magazine respectively. Second, we asked them to answer the strength of their emotional bond to their favorite site and magazine (1. not much – 4. very strong). After that, we asked the following questions. (1) How important is it for you to see other sources of information to double check the information from the advertisement on your favorite web site (magazine)? (1. not important - 4. very important) (2) How accurate should the advertisements in your favorite site (magazine) be? (0% - 100%) (3) What kind of information do you check to evaluate the accuracy of the advertisements in your favorite web site and magazine? The results demonstrated that the consumers considered it more important to double-check the information from their favorite web sites as the emotional bonds with the site became stronger, whereas this was not the case with magazines. On the other hand, they demanded more accuracy of the contents of their favorite magazines as the emotional bond became stronger although this was not the case with web sites. In addition, they use different types of cues to evaluate the accuracy of the internet and magazine advertisements: they check the product information, name of the site (magazine), comments from the other readers more frequently for internet advertisements than for magazine advertisements. Taken together, the results suggested that we have a tendency to rely on the magazine advertisements without double-checking whereas we have a tendency to explore and double-check the information from the internet. The results supported our hypothesis that our relationship with the internet is based on trust, whereas our relationship with magazines is based on assurance.

Keywords: advertisement, internet, magazines, trust, assurance

(433) The Brand Aesthetics Model

Reconciling Designers and Marketers on Brand Management

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A brand is a concept invented by marketing. Consequently, marketing publications avoid mentioning the role of designers in creating, developing and managing brands. This is a paradox, as it is common knowledge that designers and design consultancies are working on brands in their everyday activities. Designers, on the other end, tend to use the concept of brand identity and brand signature in order to define their input in brand positioning. Therefore, they are reinforcing a marketing view of design as an activity, useful for ideas in order to give form to the brand. This does not convey, however, the global role of designers in value creativity, emotion and customer experience through branding. Our aim in this paper is to share a conceptual model of brand aesthetics that we have been using in both business and education at the postgraduate level. The model extends existing brand models, and explores successively the various steps of brand management from creation to development, and from revitalization to brand evaluation. It explains the inputs, the methods and the skills of the two professions of marketing and design, step by step. In conclusion, the brand aesthetics model reconciles the two professions. Through this framework, both professionals communicate better. Marketers are more aware of design being a process, and a research-based profession beyond mere creative/graphic skills. Designers are more aware of the key concepts of brand management such as brand positioning, brand architecture, brand protection and brand evaluation. Under the same theoretical framework, the 'brand aesthetics model' merges the specific knowledge of each profession.

Keywords: Brand, Design, Brand management, Design skills, Design protection

(33) Perceptual Consumption and Brand Atmosphere *Start from Female Consumer's Fancy Bags*

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The research is mainly focusing on women'saffections, personalities and joyfulness to be placed on while they are doing their shopping; especially their consumption behaviors to be corresponded to those fancy bags. In this mode, perceptual consumption and brand atmosphere are regarded as two potential independent variables and consumption behavior is the potential dependent variable. Four sense-dimensions were used to be the positive sentiment indicators to analyze the consumption and then further discuss the relationship among perceptual consumption, brand atmosphere and women's intentions towards purchasing fancy bags. The research is preceded under the discussion after in-depth interviews; workable suggestions correlated to marketing, products are brought up and more follow-up related researching directions are mentioned to be the references on practical and academic perspectives. The research finds out the following factors are shown in perceptual consumption when female consumers are purchasing fancy bags. 1.The affection identification towards the brand and its logo also means the recognition of expressing herself. 2.The percentage of impulsive consumption is increased since they tend to identify with the type called "informative? 3.Much time will be spent on collecting information about certain brand; consequently, they know more about the brand than other people. 4.Perceptual consumption, same as impulsive consumption, can be happened easily when special offers are provided. As for the factors of brand atmosphere, it includes thereinafter, 1.Purchasing products means not only the goods themselves, but also dreams; in other words, they're pursuing a feeling that is created in particular to be enjoyed. 2.Paying attention to certain favorite brands also reflects the representation of loyalty and the confidence towards the quality of the brands. 3.Buying the products at certain boutiques reveals the faith in their serving qualities instead of the features of environments and atmosphere. 4.Purchasing certain brands can bring them the feelings of happiness, satisfaction and excitement. The order of female consumers?preference to buy fancy bags can be summed up as loyalty, awareness, quality, attitude, atmosphere and promotion; simultaneously, the value of the products?logos that comes with the brands has also been focused. Therefore, the ingredients mentioned above all have considerable referential importance when discussing about the influences of brand atmosphere and perceptual consumption towards female consumption.

Keywords: Female Consumers, Fancy Handbags and Boutiques, Perceptual Consumption, Atmosphere

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(535) CHANEL'S DEVOTION AND PRODUCT DEVELOPMENT AS A LUXURY BRAND

TAKING R&D AND PRODUCT DEVELOPMENT OF ITS WATCH BUSINESS AS AN EXAMPLE

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This paper views Chanel as a technology management company, in order to distinguish its characteristics. Technology management refers to business management conducted around sophisticated technological expertise. Although Chanel was a latecomer to the watch business, Chanel's commitment to technology is apparent in the establishment of its own workshop. Chanel's commitment to technology will be considered through the example of the J12.

Keywords: luxury brand, brand management, technology management, Chanel

(507) Study on Relation Between Sleeping Comfort and Sleeping Posture

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In order to predict sleeping comfort based on sleeping posture on a simulation, we investigated relationship between sleeping posture and sleeping comfort. In previous studies, sleeping posture had a narrow variation with the result that mattress properties had a narrow variation. In order to vary sleeping postures variously, we customized a mattress which consisted of 3 different hardness and distribution; that is, 9 different types of mattresses for this study. Furthermore to simplify the estimation of sleeping posture (mattress sinkage), we measured the displacement of sticks by attached bed coils. Sleeping comfort was evaluated by the semantic differential (SD) method when subjects lay down on their back for five minutes. Subjects consisted of 20 healthy male students aged 20 to 22. The result showed that the back sinkage tended to be larger than the buttocks ones in the case of good sleeping comfort. On the other hand, the buttocks sinkages tended to be larger than the back one in the case of bad sleeping comfort. Consequently it was suggested that there was a good possibility of sleeping comfort prediction based on sleeping posture.

Keywords: Sleeping comfort, Sleeping posture, SD method, Simulation

2010

(312) Detection of subconscious tastes for food using evoked potential and fMRI

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In recent years, worldwide food safety has been strictly monitored and regulated. At the same time, consumers have increasingly paid attention to select high quality foods. It will, therefore, be necessary to develop new food products satisfying discerning eye of consumers in order to succeed in foods industry in the future. Sensory evaluations using panels who are experts or unspecified consumers have been generally performed as a part of food product design so far. Today, such sensory evaluation is still the mainstream on the study of taste for food product design, and we suppose the trend will continue in the future. However, the conventional sensory evaluation methods are not always versatile. There is a strong likelihood that a subject's prejudice and recognition errors conceal information which we require. Since this is a common worry in food industry, other sensory evaluation methods which cover the shortcomings of the conventional sensory evaluation is eagerly desired. In the meanwhile, many studies on evaluation methodology of food sensibility using biological information of human body have been performed. However, most of the studies have been carried out to substitute a new method using biological signal analyses for conventional sensory evaluation methods. Since a breakthrough method to realize that has yet to be developed, study on a new sensory evaluation method primarily intended to cover the lack of conventional methods is even more in an early phase. We have tried to develop a new method to detect subconscious food sensibility using evoked potential. In our method, evoked potentials activated by visual stimuli using food photographs under the condition that subjects were occupied in a simple task were analyzed. Independently of the study of evoked potential, we also carried out a study of fMRI to investigate a brain activation originating in food sensibility. We have investigated the brain activation detected under the condition that subjects were given some foods which are chosen by individual subjects□Epreference. We compared the results of these two experiments. However, we found no causal relation between the result of the evoked potential analysis and the study of fMRI.

Keywords: subconscious taste, food, event related potential, visual stimulus

(302) Simulation of Extraction of Development Elevations of Body Surface

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In the current apparel business field, various brands sell clothes of a huge variety of prices or qualities. Though we have the multiple choices of clothes in this way, and it is difficult to say that every suit of clothes fits individual body shape or needs. Production system for each person is a key word of KANSEI engineering, but it is not feasible because of high cost and much time. A design system for clothes has developed in which paper patterns for each person are drafted by developing measured three dimensional human body surface shape to plane. It is necessary to build upon the skills specific to the system, because the way of the system is different from that in the real world. The purpose of this study is to recreate the draping method in virtual world. We aim to build up virtual draping method system using modeled clothes and bodies. This might realize the production of clothes for each person making use of the accumulated technical know-how. Here, cloth is regarded as continuous body and formulated based on theory of elasticity. The cloth model was triangulate for numerical calculation, and strains were calculated for each triangular element. Energy is represented as quadratic form of strains, and the force acted on each node of triangular element derived from derivative of the energy. The energy was minimized by an optimization method based on the forces. The calculation method used in this simulation is static. In this system, virtual dummy body was utilized for the base of draping, and made from the measured data of surface shape of a real dummy body. The interaction between dummy body and cloth is a key factor of this system. For the purpose, the surface shape was approximated by Fourier transform. Horizontal cross-section surfaces were extracted from the measured human body surface data. Center point of a cross-section surface was determined, distances from the center point to the surface were plotted and considered as waveform. The waveform was Fourier transformed, high-frequency components were cut and virtual dummy body was approximated. The final goal of this study is to realize draping as computer program. Here, extraction of development elevations of body surface was realized as a previous step of the goal. In the real world, there are two methods of extraction, the first is wrapping sheeting around dummy body cylindrically and take darts as required, and the second is putting sheeting on dummy body and cut sheeting along a seam line to fit dummy body. In the simulation, the second method was realized. Reference lines were drawn on the virtual dummy body. A line was defined at the center of each area surrounded by the reference lines. Put strips of sheeting tangent to the dummy body, and the sheeting sticks to the dummy body by acting attracting forces along the center line. Map the reference lines for every strip of sheeting, and extract all the parts by cutting sheeting along the mapped lines.

Keywords: Draping method system, Simulation, Cloth model

2010

(65) Kansei Impression Analysis Using Fuzzy C4.5 Decision Tree

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This paper proposes a new method for Kansei impression analysis of product design using fuzzy decision tree. Product design requires careful consideration of many factors. However, it is difficult for many developers to design a product that will satisfy everyone, because they do not know the answers to questions such as ''What causes large number of people to like a specific product?' ''What fascinates them about the product?' or ''Which part or element of the design makes it attractive?' In general, people like attractive products, but it is difficult to know what makes certain products attractive. This paper proposes a method for investigating ''attraction' by means of a fuzzy decision tree. It builds a decision tree based on the results of a questionnaire, which determines user's product impressions, and helps to uncover the major factors that affect the product's ''attraction.' In this paper, we analyzed design of running shoes and investigated the factors that determine their particular attraction, which is concerned with how to they are wanted by people. In this paper, we propose performing Kansei impression analysis using a Fuzzy C4.5 decision tree, which is an extension of the C4.5 decision tree developed by R.Quinlan and is a well-known method of data mining. This approach is capable of producing rules that automatically classify large amounts of data, based on various attributes of the data. The design of running shoe gives people various impressions because it must take into account of a number of design components. For instance, the thickness of sole may influence a profound feeling of running. To establish a relationship between overall impressions and specific product attributes, we conducted a questionnaire survey that collected a variety of product impressions from consumers. For Kansei impression analysis of running shoes, we used a 7-point scale Semantic Differential (SD) method. First, we define the 18 attributes that describe general or detailed impressions of the overall product and its components, in order to execute the questionnaire survey. In the case of the impression analysis of design of running shoes, the attributes are ''I want this shoe or I do not want this shoe.' These attributes express an overall impression of running shoe. We then include attributes for specific components to describe detailed impression of running shoe such as ''looks athletic or casual,' ''looks breathable or highly waterproof,' and ''the sole looks cushioned or stable.' In the next, we collect 30 pictures of running shoes and 100 test subjects. Each test subject looks each of pictures of running shoes and then fills out the questionnaire that records their impressions. Finally, a Fuzzy C4.5 decision tree is built that takes into account the data accumulated from the questionnaire results.

Keywords: Fuzzy Decision Tree, Impression Analysis, Running Shoes, Kansei Information

(504) Improvement in Automobile Interior Comfort by Modifying Lighting

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This study focuses on automobile interior lighting, and in a first experiment, examines the relationship between the interior illuminance, exterior lighting environment, light source form, and impression evaluations. In a second experiment, the usefulness of electrocardiogram analysis as a biological indicator for evaluating the effects of the interior lighting is examined. The results of experiment 1 indicate that impressions of the interior lighting vary according to the interior illuminance, exterior lighting environment and the light source form. These results also clarify the relationships between each condition and the impression evaluations. In experiment 2, specific tendencies regarding light source forms and electrocardiograms were observed, indicating the possibility of using electrocardiograms as biological indicators for evaluating the effects of the interior lighting.

Keywords: interior lighting, impression evaluation, physiological response

2010

(125) Research into the Design Trend of Emotional Print Advertising

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Print advertising aims to convey rational information about products to consumers and establish emotional communication by text and image. It is able to create a preference by exciting consumers?cognition to products as well as reception of text and image. Product category and design of text and image, therefore, play an important role in print advertising. The purposes of this research lie in making clear the design properties of print advertising, making a survey and tendency analysis of the properties, and further examining the recipients?emotional cognition categories under simultaneous influence of the two independent variables. By means of natural observation, we picked purposively from officially approved print advertising published in Taiwan. In this research, we took a total of 297 award-winning pieces spanning 2005~2007 in commodity class for print category of Advertising Golden Award, the longest in history and most prestigious advertising event in Taiwan, as our analysis samples. After our observation and analysis of the samples, we found that (a) “product for living demand categories?and “emotion levels of text and image?are important design properties of print advertising. In “product for living demand categories? products are categorized as handy, optional, and special, according to consumers?demand level in their daily life; “emotion levels of text and image?include high emotion, derived from emotional image plus emotional text; medium emotion, derived from perceptual image plus rational text or rational image plus emotional text; and low emotion, derived from rational image plus rational text. (b) Expression techniques of handy products in emotion level: high emotion is in the majority (32.3%), medium emotion in the second (7.4%), and low emotion in the last (1%); those of optional products compared in emotion level: high emotion (21.2%) > medium emotion(15.8%) > low emotion (1%); and those of special products compared in emotion level: high emotion (13.4%) > medium emotion(4%) > low emotion (0.3%). (c) An inference from sample analysis shows that purchase of handy products takes little strength and few risks, and less attention is paid to rational information. Therefore, high emotion level (perceptual image + perceptual text) is a frequently used technique of expression for handy products. In addition, special products, with their unique style and meaning, are often connected with the special meaning by highly emotional design of image and text in print advertising. In terms of optional products, the consumer needs to make comparisons in product quality, prices, patterns, and appearance. Besides the highly emotional design of image and text, the medium emotional design (perceptual image + rational text / rational image + perceptual text) that lies between perceptual and rational is often used to touch consumers. (d) The survey on emotion categories is in progress. In terms of visual design for different products in print advertising, this research is expected to provide with its results a useful reference for workers engaged in advertising.

Keywords: emotional print advertising, design of print advertising

(177) A conceptual framework for impressions elicited in human-product interaction

Design for meaning and design for emotion

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Affective design and human-product interaction are multidisciplinary fields. They have been dealt from different approaches and, as a consequence, a variety of concepts and terms, aimed at different objectives, have emerged. This article proposes a conceptual framework that establishes the main elements in human-product interaction, and relations that occur between them. Drawing a distinction between descriptors applied to the product (assignment of meaning) or the person (elicitation of emotions) provides a definition of the families that are emerging in design, namely, Design for Meaning and Design for Emotion. Some other aspects have also been taken into account, such as the consideration of the design process as a key moment for the study of impressions or the existence of different types of people, who may generate similar impressions inside a particular group, depending on their environment or reference criteria. The main purpose of the framework is to serve as a basis for developing a practical tool that can be used to study subjective impressions in product design.

Keywords: Design for Meaning, Design for Emotion, Conceptual framework for Impressions in human-product interaction

2010

(98) Reproducibility of KANSEI Property of Textile Fabric
A case study of high-end silk fabric

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Reproducibility of KANSEI property for textile fabric was investigated by reverse engineering. Producer's KANSEI in manufacturing process was also considered. Silk woven fabric of luxury brand apparel was selected as an original sample and the specifications were inspected. Japanese manufacturers made an experimental fabric from raw silk to finishing processing according to the specifications observed the original fabric. The specifications of experimental fabric were inspected and those physical properties were measured. Those results were compared with the original fabric. Carrying out sensory evaluation test about fabric hand, the hand of both fabrics was investigated. In addition, we tried to find the reason of different handle with physical properties. Sensory evaluation test was carried out by paired comparison test for the original and experimental fabrics. As a result of sensory evaluation test, a grasping sense for both fabrics was almost the same but senses of surface roughness and stretchy were different. Even if the specifications were given to manufactures, it was difficult to manufacture a fabric with the same hand. Comparing experimental fabrics after dyeing process to experimental fabric before dyeing process, senses of grasp and stretchy were different. It may be conceivable that dyeing and finishing processes affected to the handle. The results of sensory test on fabric hand between the original and experimental fabric were different and the reason could be that fabric handle depended on manufacturer's discretion in the manufacturing process (manufacturer's KANSEI) which was not appeared in specifications such as applied tension of warp yarn in weaving and time for dyeing and finishing processes.

Keywords: Apparel, Evaluation, Physical measurement, Sense measurement, Touch

(506) Development and Evaluation for the Japan Brand Okawa Furniture 'Sajica' Design

A Study on Construction of Quality Chart Evaluation / Diagnostic System

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The evaluation experiment that used the Quality Chart was executed in Japan and Europe for furniture brand 'SAJICA'. It has been understood that the Japanese is doing a low evaluation as a natural oppositely thing and an old-fashioned thing while people in Europe are doing a high evaluation to a traditional material and the shape of Japan when the evaluation tendencies to Japan and Europe were compared. Moreover, the part where it was felt that it seemed to be Japan was slightly different, and the difference of the image to 'Japan (Wa)' was able to be seen. In addition, three series of SAJICA were compared, and the difference of the tendency to the evaluation by the feature of the series was considered.

Keywords: Furniture Design, Design Evaluation, Regional Gap

2010

(508) Effects of Commercial Message Content Exposure on Audience Impressions

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This study investigated effects of listening and/or watching commercial-messages (CMs) on audience impressions. We carried out experiments of TV advertisements presentation in conditions of audio only, video only, and audio-video. As results, we confirmed the following two effects: image-multiple effect, that is, the audience brings to mind various images that are not directly expressed in the content, and marking-up effect, that is, the audience concentrates on some images that are directly expressed in the content. The image-multiple effect, in particular, strongly appeared under the audio only condition. Next, we investigated changes in the following seven subjective responses; usage image, experience, familiarity, exclusiveness, feeling at home, affection, and willingness to buy, after exposure to advertisements under conditions of audio only and audio-video. As a result, noting that the image-multiple effect became stronger as the evaluation scores of the responses increased.

Keywords: Commercial message content, Audio media, Video media, Advertisement

(197) The evaluation of the text design for the digital signage using electronic paper

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We examined the readability of Japanese text presented on a large electronic-paper display (font size: 48mm * 48mm), which is expected to be used as digital signage in public space. First, the appropriate line and character spacing was examined using the method of paired comparison. We changed the spacing between the lines or characters (100%, 75%, 50%, 25%, and 0% of the character size) and asked the participants to evaluate the readability of the text on the electronic paper. The results showed that the horizontally-written text on the electronic paper was the most readable when the line spacing was 50% or 75% of the character size and the character spacing was 25%. The vertically-written text was most readable with 50% or 75% line spacing and 0% or 25% character spacing. Secondly, we conducted an experiment in order to estimate the appropriate display duration. The participants were asked to read 240 characters, which were written horizontally or vertically on the electronic paper, at a comfortable speed. The results revealed that the participants read approximately 8 or 9 characters per second, in both the horizontally and vertically written text. Finally, we compared the readability of the text between the display media (paper, LCD, and electronic paper), and our preliminary results suggested no significant difference between them. We proposed a text design for digital signage using electronic paper on the basis of our empirical data.

Keywords: Electronic paper, readability, text design, visual search

2010

(518) The design of a communication media that transmits a favor

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It is known that in communication, feelings and emotions are better conveyed through non-verbal communication. And it is thought that the role played by non-verbal communication in maintaining and forming interpersonal relationship is a big one. This paper suggested and designed a communication media that can smoothly perform a communication aiming at forming and maintaining interpersonal relationship by the fact that interpersonal good will such as concern about the other person is communicated easily using non-verbal metaphor called look.

Keywords: Inter personal communication, Nonverbal communication, Gaze communication

(54) Influence of Clothing Pressure by Waist Belts on Brain Activity

Brain Activity on Difference of Perception Modality of Clothing Pressure by Waist Belt: Influence of Information from Visual Perception

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The purpose of our study is to construct the method for the evaluation of the influence of the clothing pressure on the human body by measuring the brain activity in the state of perceiving to fasten the waist belt. It is perceivable to tighten the waist belt by the somatic perception and the visual perception. The condition of brain activity resulting from pressure exerted on the abdomen by waist belts was evaluated by electroencephalogram (EEG) measurement. We investigated the possibility of estimating psychological and physiological stress arising from waist belts in clothing based on EEG measurements. There are many studies to the effect that pressure on the abdomen exerted by clothing is not desirable; however there is hardly any research on the relation between pressure exerted by clothing and brain activity. Moreover there is hardly any research describing the mutual relationships between the following three things: pressure exerted by clothing, feelings of clothing comfort and physiological response. In this study, electrodes were fixed to the scalp and EEG was measured for states of abdomen pressure and non-pressure as exerted by waist belts, with eyes open and with eyes closed. Additionally, sensory tests for sensations of tightness, arousal, and feelings of comfort were carried out. Frequency analysis of measured EEG data was carried out and brain activity as reflected in the intensity of alpha waves under the conditions of pressure exerted by waist belts was evaluated.

Keywords: Clothing comfort, Clothing pressure, Brain activity, Stress, Autonomic nerve

2010

(265) Applying Kansei Engineering on the e-commerce web of 3C product

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Due to the impact of the global economic downturn, developing new business opportunities by using e-commerce to save the cost of access and advertising becomes an important issue. In order to correctly catch the customer's demands and reduce the risk of developing new websites, this study aims to propose an interface design prediction methodology based on the integration of Kansei Engineering (KE), Rough Set Theory (RST), and Linear Regression (LR). First of all, we collect and reduce websites of 3C product and Kansei words by the MDS and K-means clustering methods. Secondly, we get six interface elements of the web page: page width, font color, product image size , font size, area of blank space, layout of columns, and four pairs of Kansei words: complicated-simple, friendly-unfriendly, fashionable-unfashionable, amazing-plain. Thirdly, through the application of the RST, we find out the significance sequence of interface elements on Kansei words. Then a mapping relationship between Kansei words and interface elements via the LR Scheme is established. Finally, we combine the mapping result with database technology to develop a user-friendly interface design expert system to help web designers to work more quickly and efficiently, at the same time, meet the customer's preferences more accurately.

Keywords: Kansei Engineering, User Interface Design, Rough Set Theory, Multiple Linear Regression Analysis

(237) The Difficulties of Using Kansei Engineering Method in Iran

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Kansei Engineering (KE) is not well-known in Iran. This study presents a pioneer work in Iran using KE to design a desk for art students and addresses the difficulties faced during this project. KE type I was used because it was compatible with available resources and its required training was straight forward considering unfamiliarity with KE in Iran. Forty study participants were chosen from undergraduate art students at Tabriz Art University, Iran. Firstly, 33 words were chosen from a pool of selected 356 words describing characteristics of product personality. Then, 10 types of desk were chosen in the same size and angels that were different in term of the feeling that they evoke. As the next step, a questionnaire was prepared (Semantic Differential (SD) method) using the selected words and images of the selected desks. The questionnaire was distributed among study participants asking them to explain about colors, forms and qualities of models. Separately, 15 designers were asked to virtually design a suitable desk for art students and accordingly answer the questionnaire. Four desks were chosen from the samples according to the analysis of answers to the questionnaire. The characteristics of these four desks together with extracted words through factor analysis of questionnaires were then used to design three new desks. A new questionnaire was prepared using these three desks and submitted to the study participants of whom 30 persons responded. The final desk was designed by analysis of the answers to the final questionnaires. During this study, we faced to the following difficulties: 1- Lack of knowledge about KE in Iran, limiting designers to design for specific target groups (i.e. art students); 2- Long delay in answering to the first section questionnaire; 3- Unfamiliarity with SD method; 4- Difficulty of study participants in relating the images to the words 5- Unfamiliarity with product personality; Adopting KE to Iranian culture would assist Iranian designers to achieve suitable results. To use KE in Iran, it is therefore recommendable to reduce the number of questions in questionnaire, training of study participants about SD method and product personality, and use of product itself instead of their images.

Keywords: Kansei Engineering, Product Design, Emotional Design, Semantic Differential method

2010

(209) Visual Image Analysis in Form of Chinese Ming Dynasty Armchair

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Furniture is one of the vital products in the daily life of human. It can react the life environment, social background, economical situation, and living custom. China history is continuous to today, due to the difference of history background, social environment, and economical situation in each dynasty, the form and style have great characteristics. During the Tang Dynasty of China, the function of chair changes from ground-sitting to chair-sitting. The form of furniture peaked until Ming and Ching Dynasty. The Ming furniture had become one of the classical Chinese furniture, for instance, Rose Chair, Official Hat Armchair, Round Chair; Horseshoe Folding Chair etc. which contain plentiful Chinese culture and philosophy significance. The research is aimed to explore the psychology perception of different armchairs. There are five represent sample chairs. Research approach mainly uses context analysis and questionnaire survey. The process of the research firstly, deconstruction the form characteristics of armchair by the context analysis. Secondly, do the armchair perception survey of form characteristics. Finally, judge the degree of the perception by the calculation. The expected results could provide the reference of design the furniture to designers, and the standard of purchase the furniture to consumers.

Keywords: Ming-style furniture, armchair, visual image

(210) Visual Image Analysis of Sections of Wooden Materials- an example by merchantable broad-leaved tree grown in Taiwan

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This research aims at the factor of composing that the visual image of sections of merchantable broad-leaved tree grown in Taiwan. Via 23 kinds of merchantable timber which offered by Taiwan forestry research institute. Research approach is using the Semantic Differential survey to probe into consumers?physical experiences to wooden material. Retrieve 72 parts of valid questionnaire altogether.The methods of calculation are Average,One-Sample T Test and Independent-Samples T Test. Its result of study reveals:(1)The tangential section of Swietenia mahogoni has most quality, graceful and exquisite feelings.(2) The radial section of Swietenia mahogoni has most warm, soft and natural feelings.(3) Paulownia taiwaniana has most ordinary feeling.(4) Cassia siamea has most vulgar, coarse feelings.(5) Actinodaphne nantoensis has most cold, stiff feelings.(6) Cyclobalanopsis longinux has most artificial feelings.

Keywords: Wood Materials, Visual imagery, Semantic Differential Scale

2010

(212) Intelligent Agents for Personalised Vehicle Configuration

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This paper introduces the agent-based framework that exploits the results coming from the Data Mining techniques implemented in the context of the CATER EU FP6 funded project (035030) [1], in order to facilitate mass customization of vehicles in the automotive industry. CATER aimed to deploy intelligent agents and knowledge management based N-Business systems, that will support modular personalisation of the automotive products to the explicit and emotional needs and wants of the international clients, as well as mass customisation of product fulfillment and flexibility of services to meet the needs of customers, suppliers, sales, marketing and the concurrent engineering team. Mass production practices manage to reduce manufacturing costs, however they fail to sufficiently reflect personalised customer needs and demands to the final products. The CATER agent-based framework aims to support the provision of more personalised products to automotive industry customers, while preserving the advantages of mass production. Today, only few automotive industries have deployed mass customization systems in their product design and manufacturing processes. None of them combines agents and Data Mining (DM) techniques for mass customisation of vehicles. The system presented in this paper, proposes a mass customisation system, which applies a set of DM techniques on data from automotive industry customer surveys aiming to generate a set of business rules that associate the users' preferences and affective needs to design elements of vehicles, following the citarasa principles, that are finally extracted into a business-logic component of an agent, representing the automotive industry and seeking iteratively customers' feedback [2].

Keywords: agents, vehicle personalisation, mass customisation

(174) Study on the Evaluation Gaps between Japan and Europe regarding Japanese Design Study on The Development of The Design Evaluation and Diagnostic System

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This study conducted an evaluation experiment of furniture applying the Quality Chart, which is a design evaluation and diagnostic tool whose development was uniquely advanced, and conducted a workshop for the analysis and interpretation of the findings. This evaluation experiment, which was conducted in Japan and Europe, evaluated several products of the furniture brand SAJICA that was developed in collaboration between Kyushu University and local companies. Analyses were conducted on the evaluation gaps between Japan and Europe regarding Japanese design. In France, the evaluation experiment was conducted at the site of an international furniture trade fair held annually every January in Paris when SAJICA products were being exhibited. In Japan, the evaluation was carried out at an exhibition of SAJICA products held in a busy public space, with people showing an interest in SAJICA asked to take part in the experiment as respondents. Results were obtained from 16 designers, 7 providers, and 86 end users. As the result of having analyzed the evaluation data obtained, particularly large gaps were found overall between Japan and Europe in criteria regarding aesthetics and flexibility, novelty, and product image. Furthermore, when a comparison was made between regions with the subjects subdivided into three groups designers, consignors, and receivers distinctive characteristics gaps were found between each group. There were gaps in many criteria between the three groups regarding storage racks in particular, with European evaluations being higher in all the criteria. More specifically, European evaluations were higher in questions regarding aesthetics, adaptability to lifestyles, and purchase motivations, with particularly large gaps between consignors. As a result of analyses, points of view regarding products were found to be different greatly between consignors, with European evaluations generally high. Whereas Japan attaches great importance to functionality, Europe puts the emphasis on aesthetics. Next, interpreting the factors in evaluation gaps by means of a workshop was conducted using the findings of the analysis. Based on the data and graphs from the findings of the analysis, the participating professional designers (divided into groups) lead the workshop in a discussion style citing the factors generating the gaps and presenting their results. As a result, four major gap factors were isolated between Japan and Europe: differences in the understanding of the Japanese concept of Wa (Japanese style), differences in temperament (national traits), differences in the perception and value toward furniture, and differences in lifestyles. These findings will be examined more thoroughly in the future. However, at the same time, a research analysis of the effects and benefits of the evaluation and diagnostic findings on the actual design process will be conducted, and a study towards practical application will be advanced.

Keywords: Furniture Design, Design Evaluation, Regional Gap

2010

(68) Interactive Therapy System Design for Children with Autistic Spectrum Disorders

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Children with autistic spectrum disorders (ASDs) experience difficulties in accessing medical treatment to help them develop specific social and communication skills because of lack of public welfare institutions, facilities, and system and government support. In particular, few children can access such treatment and the existing single-therapist clinics are inefficient with regard to cost and time. Therefore, new methods should be studied for developing various products, services, and systems for autistic children. This study discusses the potential use of an interactive design as assistive technology for such children. We utilize the experience gained in the collaborative design of the interactive therapy system (ITS). The key methods include a collaborative design with rapid interactive prototyping, heuristic evaluation, user-centered process, VR technology, tangible interface, and scenario-based contents. We applied these methods to the ITS and proved the efficiency of interactive design as an assistive technology through clinical experimentation.

Keywords: Autism, Interactive Design, Assistive Technology, Therapy

(361) Jewelry as Provocateur of Emotions

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This paper explores how emotions provoke wearing and possessing of jewelry. Emotions act an important role in the individual's mores, customs and habits with their sensitivity of jewelry. This paper illustrates jewelry provoking emotions from the possessor's individual past and from their family histories. Jewelry is often possessed by many generations in the families and due to their long biographies various memories are often attached to jewelry.

Keywords: emotions, design, jewelry, narrative data, design probes

2010

(107) Device to Measure Three-diimensional Compression Property for Surface KANSEI of Pile Materials

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Objective evaluation of woven/kitted fabrics with normal thickness has been completed for their KANSEI, applying handle values calculated from mechanical properties since 1970. KES (Kawabata Evaluation System) testing instruments for fabrics were developed at the same time [1]. For the research on KANSEI of rather thick materials like pile fabrics, carpets, natural and fake furs, handle touch is very important and becomes a first step for the evaluation. Although it is so important that the KANSEI by the first touch/vision becomes the first impression and forms the basis of the objective evaluation, the development of measurement of the frictional and compression behavior has been left. In this paper, porous materials of various kinds including piles and furs are investigated for the compression properties in relation to the coefficient of kinetic friction [2,3]. For the measurement of the compression property, the special testing machine with full equipment of 3D-compression stresses is used. On the other hand the sensory test is carried out for surface feeling of the same samples in the mechanical property measurement test by 32 subjects. Results involved in human touch sense are discussed the interrelationship with surface and compression mechanical properties.

Keywords: objective evaluation, pile materials, sensory test, 3D compression property, special testing machine

(86) The Influence of Sweat Absorbent Liners on Helmet Comfort and Comparison with Fabric Hand

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The prime purpose of a safety helmet is to protect the head against occupational hazards. However, a comfortable and ergonomic design is an important requirement in order for a helmet to be accepted by its users. We have proposed that the design and manufacture of a sweat absorbent Liners (SAL) is necessary for the creation of a comfortable helmet. The purpose of this study is to clarify the relationship between helmet comfort and the physical properties of the SAL, and to compare forehead feel with hand feel. Sensory test using the semantic differential (SD) method was carried out in order to evaluate fabric hand and helmet comfort, and adjective pairs to describe the surface touch, thermal sense, and absorbency were prepared as evaluation terms. Test subjects were asked to exercise on a bicycle type ergometer until perspiration while wearing a helmet with the SAL. Sensory tests with seven scales using the SD method were carried out in order to evaluate helmet comfort. This test was evaluated at four stages; before exercise, at initial perspiration, at maximum perspiration, and after a break. A helmet comfort rating evaluation of 0 to 5 points was assigned to the helmet. The physical properties of the SAL fabrics were measured by KES and JIS testing methods: surface properties, compression properties, warm/cool touch, and absorbency. As a result of correlation analysis between the sensory tests and the helmet comfort evaluations, we were able to determine that the 'gentle on skin' and 'smooth' feels are related to helmet comfort, and also that the 'smooth' feel of a helmet can be predicted using a fabric hand test, as evaluations were consistent regardless of the level of wetness or contacted regions. Surface friction properties and absorbency correlated strongly with helmet comfort. Therefore, the SAL is able to create a comfortable helmet by optimizing the surface roughness properties and absorbency. However, we have summarized that it is difficult to improve the thermal comfort of the helmet through changes to its physical properties.

Keywords: helmet comfort, safety helmet, sweat absorbent liner, sensory test

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(180) Assessment of visual impression of fabrics with curved surfaces

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When a sample fabric is tested for the assessment of visual impressions, a flattened fabric is mostly used with a fixed distance from the respondents. However, the visual impressions of respondents to the flattened fabrics often vary with the conditions of lighting-angle, brightness, and the viewing angle to fabric. Moreover, the visual impressions assessed in practical forms differ from the visual impressions of the flattened fabrics. These problems are often pointed out because, in reality, fabric is hardly used in a flattened state. In this research, a novel technique is proposed and simple/lucid equipment is developed in order to enable a sample fabric to simulate the visual impressions of the fabric used in a practical scene. The method allows respondents to evaluate the complex impressions of fabric in three-dimensional vision even though the sample fabrics, which sizes are only 20 centimeter squared, are used in the sensory test. In our previous studies, the image features were extracted from the fabric images captured in flattened state in order to describe the relation between these image features and human's visual impressions. A few methods for relating the assessment of fabrics' visual impressions using the new equipment to the quantified image features of the fabrics captured in various illumination conditions are proposed. Furthermore, this research shows that the new method and the simple equipment enable us to develop the assessing method for complicated visual impression of fabric that usually forms unstable shape in actual space.

Keywords: Apparel, Sensory test, Visual impression, Fabric assessment, Multivariable analysis

(151) Contribution to the mapping of customer's requirements and process parameters

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This study proposed a decision method to help designers and engineers select manufacturing process that ensured to meet customer's requirements. It has intended to make a decision on manufacturing parameters such as quality, time, cost and environmental impact. The decision method was structured by a matrix. It was used to evaluate the relationship matrix between the manufacturing process of each product attributes and all the manufacturing parameters. The method was in 2 steps. The first was to create the matrix. The second was to support how to use the matrix to make a decision and select manufacturing process. Results from the matrix can be used to guide for selecting manufacturing process that is corresponding to customer's requirements.

Keywords: Customer's requirements, Manufacturing process, Environmental impact, Leather goods

2010

(279) The Influence of Illustrative Style of Icon Design on Usability and Aesthetics

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After the previous study on the illustrative style of icon design, we found that the combination of different design features of icon will bring the different emotional effects to users. The next topic is how to implement our results to the interface design with other devices and confirming the influence of positive emotion which is relative to specific design feature between the user's evaluation of usability and aesthetics. For the purpose of verification, we choose a common interface of ATM in Taiwan as a target and consulted ten professional interface designers with questionnaire by Delphi method. We asked the professional designers to select half of the emotional words which were well suited to the interface design of ATM by their subjective judgment every times. At the beginning, twenty-four words are prepared. After sending email to and fro three times, we reduce the twenty-four words to two words- technical and stable. Then, according to the results of our previous study, we use six illustrative styles such as square-frame, plane-shadow, non-perspective, sharp-emboss, transparent material, and red color to redesign the icon used in the interface of ATM. Users are asked to execute some simple tasks like withdrawal, transferring account and changing password with the original one and the redesigned interface of ATM. After the task, users will make evaluation on usability and aesthetics with Likert scale method. The results from the evaluation will help us to explain users?satisfaction and pleasant interaction experience and how they influence the usability.

Keywords: Icon, Style, Usability, Aesthetics

(317) KANSEI to Subtle Finger Movements to Know Referential Intentions of Other People

Comparison of Dominant and Non-Dominant Hand Movements

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This study investigated the effect of adults' pointing with a circular motion on children's interpretation of the gesture and learning novel part names of unfamiliar objects. The participants were 2-year-olds, 4-year-olds and adults. In the experiment, an experimenter pointed while moving her finger with a circular motion around an object part and named a part of an unfamiliar object. The experimenter moved her finger touching the object part or moved her finger with seven centimeters distance from it. She also used either her dominant hand or non-dominant hand in pointing the objects. The participants were asked to make inferences about novel part names. The results show that the participants of all ages learned more part names when object parts were pointed with touching than when they were pointed without touching. 4-year-olds and adults focused on an object part more if the experimenter pointed it with her non-dominant hand. Adults and 4-year-olds seem to be sensitive to subtle non-smooth movement of a pointing finger and they may feel such movement is a result of a special effort of pointing something. The study suggests that humans have KANSEI to subtle finger movements to know specific intentions of others.

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Keywords: Referential Intentions, Gesture, Pointing With a Circular Motion, Dominant Hand

(534) A Study of Physical Exercise Using the Nintendo DS

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The DS was released for sale in countries around the world starting in 2004, and by March 2009, it was announced that total sales had topped 100 million units, an all-time first for a home video game console. It was announced that sales in Japan had topped 25 million as of January 2009. Additionally, according to a June 2008 study by Benesse, the DS ownership ratio among elementary and junior high school students was over 80%, with four out of every five students of such age owning one. The time 5th to 9th graders spend playing video and hand-held games on school days is at approximately 40 to 50 minutes for boys and roughly 21 to 25 minutes for girls. It is clear that the DS has firmly rooted itself in young people's daily lives. It is not unusual to see a group of children who, having gathered together with their DSs, are completely absorbed in their games and barely conversing with each other. Fundamentally, people have believed that their children were playing outside dynamically and with physical movement, and it is hard to accept that they are just standing around in the park playing their video games. Be that as it may, in order for children to remain viable in our advanced information society, it is also important that they do acquire media literacy.

Keywords: DS, Physical Exercise

(139) Study on Children's Preference for Auditory and Visual Social Cues During Interaction with Computers

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This study aims at enhancing the sociability of instructional media by adding auditory and visual social cues to engage children's attention in e-learning environments. The social cues used in the study are speech and facial expressions, both of which are essential in interpersonal communication. A quasi experiment was conducted to explore how the rendering of these two social cues affects children's attitudes toward computers and their motivation as they participate in e-learning environments. A total of 40 girls and 46 boys participated in the study. Data were collected via a questionnaire that probed into the perceived social presence, similar attraction toward computers, and intrinsic motivation. The results demonstrate children's preference for speech in auditory modality over facial expressions in visual modality. It is found that speech is more capable of eliciting children's social perception and motivating them in learning activities. Speech feedback works better than facial-expression feedback in enabling children to feel stronger social presence and yield similar attraction to computers, as well as in stimulating their motivation. The findings may help designers in choosing between social cues of speech and facial expressions for creating more sociable interfaces for children.

Keywords: Social Cue,Interface design, Speech, Facial Expression, Child

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(351) Using Emotional Interactions for Visual Navigation Task Learning

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The aim of this study is to show how robots learning could be easier and accessible to non experts if it relies on emotional interactions, more precisely on social referencing abilities, rather than on specialized supervised learning technics. To test this idea, we coupled two systems : a robotic head able to learn to recognize and imitate emotional facial expressions and a mobile robot able to learn autonomous visual navigation tasks in a real environment. Two possible solutions for coupling these two systems are tested. First, the emotional interactions are used to qualify the robot's behavior. The robot shows its ability to learn how to reach a goal-place of its environment using emotional interaction signal from the experimentator. These signals are giving the robot information about the quality of its behavior and allow it to learn place-actions associations to construct an attraction basin around the goal-place. Second, the emotional interactions are used to qualify the robot's immediat environment. The robot shows its ability to learn how to avoid a place of its environment by associating it with the experimentator's anger facial expression. The first strategy allows the experimentator to teach the robot to reach a specific place from anywhere in its environment. However, this strategy takes more learning time than the second strategy that is very fast but seems to be inappropriate to learn to reach a place instead of avoiding it. While these two different strategies achieve satisfactory results, there is no reason why they should be mutually exclusive. In conclusion, we discuss the coupling of both type of learning. Our results also show that relying on the natural expertise of humans in recognizing and expressing emotions is a very promising approach to human-robot interactions. Furthermore, our approach can provide new interesting insights about how, in their early age, humans can develop high level social referencing capabilities from low level sensorimotors dynamics.

Keywords: Emotionnal interactions, interactive learning, autonomous robotics

(426) Looking for common traits between musical and physical gestures

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This paper investigates the relations between music contents and other non-verbal ways of expression. In particular, the idea that music is, among other things, a performing art and it is composed by what we commonly call musical gestures, suggested us to study if and how some aspects of music expression can be associated with the properties of a physical gesture. An experiment was carried out in order to verify whether subjects are able to associate musical excerpts with physical properties, such as elasticity, inertia, and friction, represented by means of a set of computer generated haptic stimuli. The comparison with a previous study on the affective response to the same set of excerpts allows us to point out relations among the physical, the musical, and the affective domains.

Keywords: Expressive information processing, Musical and physical gestures, Audio analysis, Perceptual analysis

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(280) Gestural Interface to Explore Audio Libraries and Enhance Musical Experience

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In recent years, through the spread of portable digital music players and music distribution sites, the amount of musical information available has increased. This enables us to control, select, and listen to a great number of songs even in our hands. Therefore, the load of music retrieval and database manipulation that falls to the user when listening to music is growing. Under such circumstances, a system that can provide a more comfortable information control is required. In this paper, we propose an interface that enables a smooth music selection while listening to music. This is a system that explores music by feeling, using the user's body movement in real time with the intention to control the sound and song. Especially, it aims to support the seamless selection of the music the user wants to listen to at the time, without specific data retrieval but rather following the user vague musings. The user can switch the tracks s/he listens to one after another by doing a swishing motion in the air. The intuitive operation and the selection of music are enabled by making a groping movement. Furthermore, the developed system makes us enjoy these operations themselves by using several gestures while listening to music. We have been developing a music exploration system through a glove-like device, which the user wears with one or both hands. The system is composed of the glove-like device for gesture recognition and a PC for processing and speakers. An acceleration sensor and several bend displacement sensors are installed in the glove-like device, and the sensor data is transmitted to the PC for processing through Bluetooth. Max/MSP was used for the control of the sound. Audio signals and music tracks can be manipulated by the user wearing the device and doing the appropriate gestures based on gesture recognition. Concretely, the user can enjoy basic play operations, sound operations like scratching, and switch operations of continuous music by shaking or swinging the arm. Using the wearable device, it was possible to achieve a compact system configuration and to develop a stand-alone device instead of leaving the load of installation to the user. The developed system allows us to explore and change music while incorporating the control of music that DJs enjoy in addition to sound control. This presents an easy to operate system that uses body motion and provides a method of listening to new music. It also aims to create an emotional and affecting musical interaction, and will provide a better method of listening to music. In this paper, the proposed technique for sound and music control is first explained. Next, the device and the system that was developed are described. Afterwards reports of an operation experiment by the system that mounts the device, the conclusion and considerations of the present study are described.

Keywords: Music technology, Gesture recognition, Wearable Interface

(431) Active music experience using mobile phones

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This paper describes novel forms of social interaction based on music and gesture, with a special focus on Kansei aspects such as real-time analysis and processing of non-verbal expressive, emotional content conveyed by human full-body movement and gesture. The application scenario is active listening of music using mobile phones and a networked end-to-end research platform developed in the framework of the FP7 EU- ICT Project SAME (www.sameproject.eu). Active listening is the basic concept for developing interactive music systems which are particularly addressed to a public of beginners, naïve, and inexperienced users. User non-verbal behavior and gesture are measured to modify in real-time music content: for example, mobile phones are used to detect the movement of the user, to activate and control the music sections; or users move rhythmically and the phase synchronization extracted from their gesture drives the orchestration and rendering of a pre-recorded music. At a higher (Kansei) level, user gestures are analyzed in order to extract their expressive, emotional content. Such information is used to affect in real-time the emotional content of music e.g., by exploring different expressive performances of the same music piece (e.g., an intimate, an extrovert, a solemn, and an angry one). We describe two applications based on active listening developed in SAME and presented at the Agora Festival 2009 in Paris. The first one is called “Mobile Orchestra Explorer”. The user stands in a room equipped with sound speakers, holding his mobile phone in his hand. He can see on the display of the mobile a simple graphical representation of a virtual orchestra, with icons showing the position of instruments/sections in the space. A red cursor on the mobile display follows the user position in the orchestra space. The user task consists of exploring this space to discover the music the instruments are playing. By tilting the phone on the left-right or forward-backward, the user moves the red cursor in the orchestra space: when the red cursor gets close to an instrumental section, the user gradually listens to such section. When the user performs expressive gestures, music expressive content is molded accordingly. For example, a harsh, abrupt gesture causes the instrumental section to be “frightened” and a deformation of the sound is heard. Recognition of different expressive contents causes exploration of different expressive performances. The second application, called “Sync’n’Move” is a first example of shared collaborative active music listening experience. Two users interact by freely moving their mobile phones, which can be hold by hand or worn. An index of phase synchronization is extracted from their gesture: every time the users are successful in being synchronized the music orchestration and rendering is enhanced; in case of loose synchronization the music gradually looses sections and rendering features. Such a synchronization index is a preliminary step toward the analysis of subtler, Kansei aspects of social interaction, such as empathy. We also present an evaluation study of the above applications based on data collected with questionnaires filled up by participants attending the Agora Festival 2009.

Keywords: entrainment, synchronization, emotion, joint music activity, multimodal interaction

(532) Design of Auditory Processing and Subjective Classification for Music

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We used Kansei engineering to analyze how humans relate to sound and music. We analyzed what features of sound humans paid attention to and how humans interpreted sound. At the physiological level of sound processing, sound is processed according to its auditory characteristics. At this level, humans don't interpret the image of the sound; there is no subjectivity. By using auditory characteristics, we investigated the features pertinent to the analysis of sound and music. We considered early processing in the auditory nervous system as extracting the changes in power, which are obtained from the segmentation of sound-signals by frequency band and time interval, and contrast, and the features obtained by that extraction. At the cognitive level, we analyzed the correlation of those features with words that subjects associated with the features. Through this modeling, we developed a method for retrieving sounds and music with similar associations, or images evoked by particular words.

Keywords: Music, Retrieval, Contrast computing, Physiological filter

(35) Extracting the Minimum Structures of Musical Schemas from Traditional Japanese and Chinese Folk Songs

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In this study, we extract the pitch transition patterns from both traditional Japanese and Chinese folk songs and examine the characteristics of their respective schemas. Specifically, we sample 1,794 works from Nihon Min-yo Taikan (Anthology of Japanese Folk Songs, 1944-1993) for Japanese folk songs and 2,040 folk songs from a website providing virtual musical scores for Chinese folk songs, and probabilistically create a tree structure in modeling a variable-length Markov chain to compare minimum transition patterns occurring with high probabilities in terms of pitch intervals. A variable-length Markov chain, also known as a FSMX model or a finite-memory source, is a Markovian process having a sparse memory structure with states that closely cohere. The structure can be characterized by a parsimonious number of transition probabilities for stationary categorical time series. The results indicate that (1) the minimal structures of Japanese folk songs tend to create a longer schema than Chinese folk songs, and vertical transitions are sung within a small range; to be exact, below intervals within a perfect fourth pitch. On the other hand, the minimal structures of Chinese folk songs tend to create a shorter schema than Japanese folk songs, and their vertical transitions extend beyond the interval of a perfect fourth pitch, and (2) the formations of perfect fourth pitches and perfect octave characterize the respective musical schema.

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Keywords: Music cognition, Folk songs, Schema

(511) Influence of Kansei Factors Included in Motion Information on Kansei Evaluation

Investigation of Multiple Effects by Horizontal Contact Movement and Camerawork

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In most mobile information device interfaces, due to the limitations of hardware and software it is difficult to obtain feedback from the movement information to the observer's body sensations, and it is often pointed out that it is not easy for the observer to achieve 'Presence'. This study focused on the kansei factors included in movement information by investigating the complex effects of the combination of different modes of expression, in order to understand how each motion pattern influences the observer's evaluation when the movement image is displayed by a mobile information device interface. We used bioinstrumentation for the subjective assessment of brain waves and a 5-step evaluation process. The results showed that the increase in the potential, were centered on FP1 and FP 2 depended on whether the image contents moved or not, and that the evaluation by the brain waves was connected with the pattern of movement at a certain level.

Keywords: Kansei evaluation, Motion information, Bioinstrumentation

(339) Affective Video Analysis by Using users' EEG and Subjective Evaluation

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This paper describes a research project conducted to study the relationship between videos and users' induced physiological and psychological responses. Firstly, a set of 43 film clips are carefully chosen, and 20 subjects are invited to participate in our experiment. They watch several of chosen clips while their EEG signals are recorded synchronously. After each clip, the subject is required to report his real induced emotion using emotional valence, arousal, basic emotion category and intensity. Secondly, several classical movie features and EEG features are extracted, and feature selections are conducted by computing the correlation between each feature and the arousal or valence. Thirdly, selected movie features and EEG features are used to simulate the arousal and valence respectively by employing the linear relevance vector machine. Fourthly, selected movie features are used to simulate the EEG feature values, and vice verse. The results show that arousal/valence can be well estimated by either video features or EEG features. Apart from that, they also indicate that there exist certain relationship between the videos and induced EEG signals, and some relation models are acquired. Finally, clustering is conducted to map the emotion dimensions to emotion categories. Thus, the gap between videos and emotion categories, as well as the gap between the EEG and emotion categories, has been bridged to some extent. This result could provide a reference to applications in brain-computer interaction field.

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Keywords: affective video analysis, EEG, valence, arousal, emotion categories

(41) Kansei Design Method and its Application on Industrial Design of Massage Chair

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With the development of product design, perceptual and emotional experience slowly becomes the focus of the design. What the designers concern about is how to transform people's perception into the design factors. Based on the close relation between Kansei Engineering and cognition science, we have proposed a method of the perceptual localization from the angle of cognition and psychology. In this paper, a feasible and integrity design procedure is proposed, as follow: to do the perceptual localization using the perceptual survey experiment, to do the form design using Gestalt psychology, to do the detail design using Semantic Difference Method, and so on. Finally, an application example on massage armchair's design has been hold up to show how this design procedure works.

Keywords: product design method, Kansei engineering, Gestalt psychology, Semantic Difference

(228) The Relationship Between Eyebrows Position, Shape and Human Mood

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Eyebrows with different shapes present different feelings and signal information. People have many shapes of eyebrows including long, short, curved, straight, slanting, caret-like, single and large-gap brows. Eyebrows are the most subtle body language (involuntary body language) and appear to describe people's mood and character. Eyebrows position and shape give impression and tell different information. Therefore, we investigate the relationship between eyebrows position, shape and human mood. We use the sorting method in KANSAI engineering to analyze the eyebrows. First, we defined 17 variances constituting the brows head, the brows peak and brows tail to describe all kind of eyebrow. Second, by using KJ method to classify 88 vocabularies, human moods are classified into 3 image vocabularies, 'gentle', 'depressed' and 'resolute'. Third, according to the above 3 image vocabularies and 49 eyebrows sample pictures, invited subjects are categorized into 9 groups. Finally, the numerical material will be put in SPSS to carry on the multiple regression analysis. We got the following results. The higher emergence degree (not obvious boundary) and the higher brows give the gentle feeling for human. The lower brows, the higher eyebrows tail, the thicker eyebrows color and the higher eyebrows peak (it is farther to eye) give the resolute feeling for human. The higher brow and the higher emergence degree will give the depressed feeling for human.

Keywords: Eyebrows, human mood, KJ Method, Grouping Method

(128) Study on Comfortable Elements of Wet Cotton Hand Towels "Oshibori"

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The "oshibori" (a small wet towel to wipe the hands or face) is generally served to each customer to clean the hands or face before eating in places such as restaurants, bars, coffee shops and so on. Serving an oshibori is one of the Japanese original cultures and has been handed down in Japan since old times. The oshibori has been used in the whole of Japan since 1960s with a development of the restaurant industry in Japan. A number of studies, however, have been made on the oshibori from the cleaning and sanitation viewpoints, there are few studies on aquantitative evaluation of feelings of the oshibori. In this study, we tried to clarify important elements to decide comfortable feelings of the oshibori. Although there are roughly two kinds of oshiboris made of cotton and paper, we focused on cotton oshiboris, and carried out an evaluation experiment for cotton oshiboris. At first, to decide suitable words which represent characteristics of the oshibori, we corrected 1189 adjectives from several reports and reference books. We conducted a questionnaire survey to classify the corrected words, and then we narrowed the 1189 words down to 16 words of "favorite," "comfortable," "large," "pretty," "high-grade," "shapely," "soft," "thick," "clean," "moist," "luxurious," "heavy," "strong," "safe," "feel-smooth," and "rare." Next, we carried out a subjective experiment to evaluate 25 kinds of cotton oshiboris with various sizes and thicknesses. Thirty-seven males and seven females, aged twenties to fifties, participated in the experiment as subjects. The subjects evaluated the oshiboris by grading them from one to five (one being the lowest and five being the highest) based on the above 16 words. We performed a factor analysis to the experimental result and extracted the following three factors; the first factor defined as "dignity factor" in which the absolute values of the factor loadings of "luxurious," "strong," "large," "heavy," "high-grade," "thick," "safe," "moist," and "pretty" were high, the second factor defined as "preference factor" in which the absolute values of the factor loadings of "shapely," "favorite," "comfortable," and "rare" were high, and the third factor defined as "touch factor" in which the absolute values of the factor loadings of "feel-smooth," "clean," and "soft" were high. The score of the dignity factor increased as the size of the oshibori became large. The score of the preference factor was high when the size of the oshibori was between 25 cm square and 35 cm square. And the score of the touch factor was high when the size of the oshibori was 30 cm square. There was not any remarkable tendency between the thickness of the oshibori and the three factors. As results, noting that the size of the oshibori that the subjects felt high-class was above 30 cm square, and that the size of the oshibori that the subjects felt the most favorable was between 25 cm square to 35 cm square.

Keywords: oshibori, hand towel, subjective evaluation

(150) Assessing Gameplay Emotions from Physiological Signals:

A Fuzzy Decision Trees Based Model

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As video games become a widespread form of entertainment, there is need to develop new evaluative methodologies for acknowledging the various aspects of the player's subjective experience, and especially the emotional aspect. Video game developers could benefit from being aware of how the player reacts emotionally to specific game parameters. In this study, we addressed the possibility to record physiological measures on players involved in an action game, with the main objective of developing adequate models to describe emotional states. Our goal was to estimate the emotional state of the player from physiological signals so as to relate these variations of the autonomic nervous system to the specific game narratives. To achieve this, we developed a fuzzy set theory based model to recognize various episodes of the game from the user's physiological signals. We used fuzzy decision trees to generate the rules that map these signals to game episodes characterized by a variation of challenge at stake. A specific advantage to our approach is that we automatically recognize game episodes from physiological signals with explicitly defined rules relating the signals to episodes in a continuous scale. We compare our results with the actual game statistics information associated with the game episodes.

Keywords: Emotion Recognition, Video Games, Physiological Signals, Fuzzy Sets

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(53) Games for Affective Learning
Making Play Support the Emotional Domain

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The role of computer games in learning is becoming more common, but little research has been dedicated to affective learning, an important aspect of education that can also be addressed through computer games. We first present different perspectives on affective learning and our framework based on activity theory, and we then discuss our approach to the design of affective learning games. To inform design for affective learning, we investigated which affective strategies games already use and how they could be harnessed to suit our context. We present examples related to game representations and game mechanisms and emphasise the bond between player and avatar. Computer games can present a model of affective behaviour to the player through the avatar's actions and reactions, the affective interactions between characters, and the utilisation of affective tools to resolve emotional dilemmas within dramatic situations. By vicariously managing emotional situations and experiencing the emotions of their avatar, the player can learn how to feel and grow along with their avatar. We highlight the limitations of current games in the integration and portrayal of affective behaviour within the game-play and their suitability for player-learners. We then conclude by discussing remaining design issues, and suggest that Kansai Engineering can serve as a bridge in the design of mediation between players and affective learning goals, guiding the design of the game-world and game-play.

Keywords: computer games, affective learning, socio-emotional, activity theory

(413) A Study of Information Processing in the Brains of Players During Playing the Hyakunin-Isshu Karuta Game

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This paper describes an experiment using an optical functional brain imaging (fNIRS) aiming at clarifying information processing in the brains of players during playing the Hyakunin-Isshu karuta game (traditional Japanese playing cards). We measure oxidized hemoglobin (oxy-Hb) values in the prefrontal cortex, which is responsible for the most important information processing to produce tactics for winning, at 22 measuring points using 8 optical detectors. The experimental results for 4 players show the following. (1) One of the characteristics common to all the players is that a peak of the oxy-Hb values is observed in every cycle of one-unit game of taking one card (one poem-reading unit). This cycle corresponds to the cycle of "tense - maximum tense - relax" in the mind of the players. (2) Oxy-Hb values in the front parts of the prefrontal cortex are greater than those in the back parts of the prefrontal cortex and are sustained until the end of the game. This suggests that various high-degree thinking continues all through the game. (3) Oxy-Hb values tend to decrease in many back parts of the prefrontal cortex as the game progresses. This tendency suggests that motor controllability decreases due to fatigue caused by repeated body movements. However, this tendency is not observed in some parts for some players, which may be caused by the factors such as difference in progress of games, difference in players, etc. (4) The results of investigation for one top-grade player about brain activities depending on situations show that there are significant differences in many parts between when the player has taken the karuta and when there is no target karuta. (5) The factors of this significant increase in oxy-Hb values when the player has taken the karuta may be the production of high-degree tactics in the prefrontal cortex, command of body movements in the pre-motor cortex, etc. The above results are consistent with the information processing cycles in the brain, in which high-degree reception, cognition and processing of auditory information, and quick body movements are repeated in the case that a player takes a karuta during the play.

Keywords: the Hyakunin-Isshu karuta game, brain, prefrontal cortex, optical functional brain imaging, oxidized hemoglobin

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(233) Emotional interactive storyteller system

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This paper presents a concept and initial evaluation of the emotional interactive storyteller system. Our concept is derived from our knowledge of the pre-medieval oral storytelling tradition and its application to therapeutic storytelling. Our initial evaluations are based on a mock-up of the concept where emotional content of the story is reinforced with an expressive agent, which was subjectively tested with a sample of volunteer users. The results of the evaluation are very helpful, confirming that the concept is useful and meaningful in general to the user, and providing us with valuable feedback in shaping the ongoing design for a full implementation.

Keywords: storytelling, embodied conversational agent, emotional behaviour

(482) The Effects of Emotion, Spatial Ability, and View Point for the Sense of Telepresence in a 3D Computer Game Environment

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Telepresence or the sense of "being there" has been discussed in the literature as an essential, defining aspect of virtual environments, including definitions rooted in behavioral response, signal detection theory, and philosophy, but has generally ignored the emotional aspects of the virtual experience. The purpose of this study is to examine the concept of telepresence in terms of people's emotional engagement within an immersive mediate environment. Two main theoretical statements are discussed: (1). Subject telepresence: emotional factors and spatial ability; (2). Objective telepresence: point of views, in a 3D computer game environment. This study has implications about how research should be conducted to further our understanding of telepresence. Validated psychological subjective techniques for assessing emotions and sense of telepresence will be applied to increase our understanding of virtual experiences. Further understanding of the interaction between telepresence and emotional state will improve our knowledge of the construct of presence as well as better inform us about how a virtual environment, such as a 3D computer game, can be applied in creating and designing emotional effects.

Keywords: Telepresence; Emotion; Spatial Ability; View Point

2010

(357) Emotional impact on designer's cognitive process in the early stages of design

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This paper explores the role of emotional impact on designer's cognitive process in the early stages of design. After a short review of the current research status of designer's cognition and emotion, we propose two-way impact that seems important to understand the emotional impact on designer's cognitive process: (1) Emotional impact in generative way is to regulate or activate the mental information process. (2) Emotional impact in evaluative way is an emotional reaction which causes evaluative judgments on the designer's idea or even about himself. The two-way impact has a strong relation and influences on each other during cognitive process in the early stage of design. Finally this paper will discuss the current methodological and technical issues to assess designer's activity, as well as perspectives for further work.

Keywords: emotional impact, designer's cognitive process, early stages of design

(458) Research for humanity technology and physiology influence factors in product styling design

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This paper uses method of multi-subject synthetic study. Many kinds of limited conditions to product styling design were researched. It discovered product had made lots of relationships of observation, using, sentimental exchange, research, collection with human. Product also made relationships with politic social environment, economical environment, market environment, natural resource environment, technical environment, cultural environment. Product styling design is based on human vision rule and product intrinsic special function, observes principle of vision and psychological of gestalt and Berlyne rules, limited by technical manufacture level, facing request of ergonomics and product semantics, examined by fashion symbol in business environment, needs cultural connotation to promote product value, and needs product identity design to carry on standard operation to product system.

Keywords: product styling design, vision rule, design limited condition, gestalt rules, Berlyne rules

2010

(288) Research on Relationship Between Cultural Identity and Product Preference

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This research focuses on the investigation of design and application of cultural characteristics in Jhishanyen Cultural and Historic Park. The aim is to identify local culture and pursue its transformation for design application in symbolic images and commercial products. The research question is to find which cultural patterns are preferable, which characteristics results in easily-identified cultural patterns, whether those patterns applied to products are more or less preferable, and whether aesthetic experiences influence the other main factors of product preference. In order to meet these objectives, researcher'sextracted further cultural factors by reviewing relevant literature, conducting interviews and administering questionnaires regarding local culture. Correspondence Analysis was used to identify cultural characteristics. According to cultural characteristics of design patterns, from among seventy-two patterns, designers chose nineteen patterns based on local cultural identity and aesthetic preference. Then researchers applied those patterns to sofa material and a handbag. Through Semantic Differential method, Factor Analysis, Cluster Analysis, and Regression Analysis, researchers found the results of preference opinions among study participants. Results showed that three factors significantly influenced preference for the sofa material and handbag: symbolic of local culture, aesthetic sense, emotional affinity. Aesthetic sense was the factor which resulted in most participants selecting higher values for "identify with" or "like" regarding the patternsapplied to design of sofa material or handbags. Among these types of products, the factor of being symbolic of local culture did not strongly influence "like" rankings.

Keywords: regional culture, cultural identity, pattern, design transformation, aesthetic

(515) Computational Modeling of Visual Perception and its Application to Image Enhancement

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As digital cameras have become ubiquitous, most images we see now are digital. However, digital imaging is not based on human visual perception. Here, we propose computational models of lateral inhibition and light/dark adaptation, which are characteristics of human vision, and of color perception. A combined model relates human visual characteristics to human perception. We used this model to enhance images and to overcome defects in color vision. Our approach generated easily viewable images which create unchanged impressions in viewers.

Keywords: visual characteristic, lateral inhibition, light/dark adaptation, image enhancement, defect in color vision

2010

(500) The Creation of Le Centre Le Corbusier as Kansei Space

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The purpose of this paper is to clarify the creation of Le Centre Le Corbusier (1964-1967) that is the final prototype of the pavilion of architect Le Corbusier to consider the relation of the exhibition space and the Kansei (sensibility) from the viewpoint of Kansei-philosophy. The creation of Le Centre Le Corbusier is the process of uniting the art works and the landscape. This is characterized by adopting the Kansei space elements such as the slope, the roof garden, revolving doors, and exterior ponds. The slope that induces the interior-exterior views is especially the most effective element that relates to a body, and it plays the role to provide various views to the exhibition space and landscape. In other words, the body on the slope is surrounded with the Kansei space integrated into the landscape.

Keywords: Le Centre Le Corbusier, Exhibition space, Landscape, Slope, Kansei space

(272) Research of Taiwanese chili hot pot culture
Attractiveness and consumers

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Benumbingly spicy hot pot, also known as chili hot pot, is from Sichuan. It was chiefly eaten for the purpose of preventing edema by forcing people to sweat in summer. However, in Taiwan, to eat the chili hot pot is no longer restricted in summer, and moreover, develops new Taiwanese chili hot pot culture. This research is mainly discussing attractiveness of eating chili hot pot and its consuming groups to understand the culture behind as a guidance of Chinese food culture and creative industry development. The research is constructed in two parts: (1) Investigation of attractiveness—using EGM (evaluation-grid method) to interview chili hot pot lovers and constructed evaluation-grid chart. Then, sorting out the result into 5 attractiveness hierarchical charts, the 5 attractiveness are satisfaction of flavored delicacies, warm atmosphere of being together, peppery feeling, diversity of foods and self-determination, and value for money. (2) Analysis of consuming groups—making questionnaire based on the result of attractiveness hierarchical charts, and applying cluster analysis. The result shows 6 consumer groups of eating chili hot pot: the flavor- added ordinaries, the swarmed gluttons, the principled, the chili-possessed, the exclusive gourmets, and the join-in-the-funs.

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Keywords: Chili hot pot, Attractiveness, Taiwanese food culture, EGM

(110) A Comparison Study on the Use of Review Panel Evaluations for Decision-Making in Vehicle Design by Japanese, European and U.S. Automakers

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As consumer products have become increasingly diversified, new product categories are emerging, and existing ones are either expanding or consolidating with others. In the midst of these ongoing sweeping changes, combined with growing competition in the global market, consumer products companies find it critically important to develop and successfully launch creative and innovative products in the market on a timely basis. This makes it even more important for manufacturers to make a timely and speedy decision about industrial design to be applied to new products. That said, a significant part of the design development process is carried out in the creative minds of industrial designers, and only a small part of it is apparent to visual observation, as compared to a more visible manufacturing process. Therefore, the decision-making for evaluating and selecting the visible part of a design process is all the more important. Decision-making about industrial design is affected significantly by the design-evaluation system, the organizational structure and functions of an in-house design unit, its positioning in the corporate structure, and its areas of responsibilities, among others. In this study, we look into how major Japanese, European and U.S. automakers conduct formal review panel evaluations—asking parties not directly involved in vehicle development to review and evaluate proposed vehicle designs—and how they act upon the results, to identify patterns and differences among them.

Keywords: Design Management, Panel Evaluation, User Involvement

(479) The Gendered Motorbikes
How Does History Make Motorcycle/Scooter Masculine/ Feminine?

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Most promoters of 'emotional design' emphasize that design should surpass the usability of products. However, the product experience is complex. Krippendorff claims that: 'the question of how and which emotions are invoked while using artifacts naturally follows the question of what artifacts could mean.' Besides personal psychological attributes, the social and historical effect could operate in a reflective level and be hard to find. So, the studies about cultural or symbolic meanings of products, such as gender, are limited. Gender seems ambiguous or uncertain in the sets of positivist research. Consequently, an alternative approach seems necessary. This research explores gender issues of the transition of motorcycle in Taiwan around the period of World War II, exploring how meanings are embedded in objects through history. By analyzing the design of motorcycles/scooters through time, the implications of gender to everyday life are further examined, the meanings attached to products and related emotional processes incorporated. Emotion research is helpful in understanding the invisible psychological structure behind product design, and bringing gender consciousness into this area helps to fill in the gap that has long been ignored, which is of great potential to future studies.

Keywords: emotional design, gender, motorcycle/scooter, semiology, design history

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(408) A Kansei Model for Preferences of Chicken Appearance in Chiang Rai and Okinawa

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Domesticated creatures, such as chickens, have evolved into different forms of their untamed ancestors, and artificial selection by humans has led to more uniform physical and physiological features and the like. In this process, elements such as the cultural background of the area, the purpose of breeding, people's sense of values, and livestock, and kansei have all affected the creature's biological features, including variety, form and col- or, to some extent. The common-or-garden chicken, Gallus gallus domesticus is considered to have been domesticated from its wild ancestral form - the red jungle fowl (Gallus gallus) - for the purpose of exploitation by humans. The coloring of the plumage and shank of the chicken are considered to be quite important elements for ritual ceremonial use in some Asian countries and regions. In order to elucidate the domestication process, we propose an examination of whether individual elements based on different cultural backgrounds (e.g., senses of values, pre- ference and knowledge) influence judgment in human evaluation of the shape and color of chickens during domestication. We conducted a survey in Thailand's Chiang Rai Prov- ince and Japan's Okinawa Prefecture to enable comparison of local investigation results between the two countries. The optimal solution models obtained demonstrate differences in preference related to the appearance of chickens between the target nations of Thailand and Japan.

Keywords: form, kansei evaluation, preference investigation, conjoint analysis

(366) Communicating Sustainability:new messages, new tools

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Living on planet earth is a growing challenge, with new limits, boundaries and frailties. Governments and companies must be prepared to face real commitments, rather than new marketing strategies. But not all the responsibility lies with institutions, governance or legislation; also the individual (the consumer) plays a central role in this quest. The reason is very simple: businesses will adapt and be shaped by consumer demands, and a more proactive citizenship will stimulate governments to change and adapt their policies. Therefore designers, as citizens and professionals should also be responsible to make their contributions. Until recently, “eco” and “sustainable”, have been subjects mainly for the industrial designers to research. However, gradually Graphic and Communication Designer, especially since the “First Things First Manifesto”, have become increasingly aware of their need to raise a conscience in fundamental issues like ethics, environmental and social responsibility. This paper is part of an ongoing PhD research, and in the paper here presented is the first part: the state of art and literature review. The complete PhD research is expected to bring relevant contribution to: •Define Sustainable Communication Design •Identify a code of ethics •Classify tools, material and techniques that are more in favour with sustainability •Add value to communication.

Keywords: communication design; design principles; sustainability

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(87) Comparative Analysis of Users' Kansei Evolutions during the Lifecycle of their Short-lived and Long-lived Products

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This research deals with the length of subjective or psychological lifetime of products. The durables, indeed, should be able to last not only objectively but subjectively, as their expected objective (i.e. material, physical or techno-functional) and the subjective (i.e. psychological, emotional, affective and/or aesthetical) lifetimes should be in harmony. Most researches concerning the extending of products psychological lifetime have focused on user-product attachment as the only effective means in this regard. However, the subjective issues of products are not limited to this and there may be some other means being effective for extending products psychological lifetime, what is called Product Subjective Sustainability in this research. As Kansei embraces all subjective issues of product (such as aesthetics, emotions, image, attitude etc, which are concerned with user's emotion and sensitivity), this study is based on Kansei Engineering approach. To find out the other possible means being effective for product subjective sustainability, we aim to carry out a comparative and analytical study on the evolution of users' Kansei toward the short-lived and long-lived products during the entire lifecycles of those products. The product lifecycle from user perspective is divided into three different stages including purchasing or choosing, keeping or using and replacing or throwing away the product. The assigned short-lived and long-lived products for case study and analysis in this research are respectively mobile phone and private passenger car. The outcome of this study would be the Kansei factors associating with the investigated groups of subjects' rationale when purchasing, keeping/using and replacing their mobile phones or private passenger cars. According to the results of the previous research that the authors have done on the change of a group of subjects' Kansei toward their mobile phones, there are various patterns of Kansei evolution indicating three major trends of subjective sustainability of mobile phone named as: attachment, ally or partnership; and care or mind. To verify and develop such trends, in this research, a wider group of subjects using mobile phone and also a group of subjects using private car would be investigated and the changes of their Kansei toward their mobile phones or cars would be analyzed. Then, the extracted patterns of evolution of their Kansei and the drawn trends of product sustainability would be compared. In respect of the general impact of this research in terms of the socio-ethical responsibility of design, the clarification of 'product subjective sustainability', overall, can be an initiative attempt for realizing and crystallizing the sustainability values in daily used products emotionally and aesthetically.

Keywords: Product; Subjective Sustainability; Psychological Lifetime; Kansei Evolution; Mobile Phone; Passenger Car

(165) Kansei Information Processing in Product Design

Exploring the role of visual information in designers' activity

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Images play an important role in design activity. Not only are they a tool which designers intensively use and highly appreciate but they are also proved to enhance designers' creativity. How are images perceived and processed by designers ? In order to get a deeper understanding of design implicit processes with a focus on the use and effects of visual information, we chose to look at the design process through the prism of cognitive neuroscience. Therefore, we report here some recent neuroscientific findings on visual perception and visual processing which we found relevant in the context of design science. Based on them, we draw perspectives for future research on the role of visual information in design activity.

Keywords: Design cognition, Kansei information, Visual processing, Creativity

2010

(121) Models from Psychology and Marketing applied to Kansei Engineering

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This paper considers new models from Psychology and Marketing that extend the general Kan- sei approach. We sketch a framework that views design as understanding (1) the consumer's representation of the product space, (2) the consumer's choice function, (3) the designer's repre- sentation of the design space, (4) the designer's choice function, and a connection between those four properties. This framework helps organize some existing methods and points to areas ripe for development of new models.

Keywords: Psychology, Choice, Multivariate Analysis

(309) Revisiting the definition of preference in preference mapping studies

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In order to model consumers' hedonic responses and behaviour on the basis of product characteristics, sensory scientists and developers in the food industry frequently apply preference mapping techniques. These techniques allow finding on a descriptive sensory factorial map a region corresponding to an optimal product from the consumer point of view. The technique also allows identifying the key attributes that drive preferences. The synthetic representation of response surfaces proposed by Danzart et al. (2004) for preference mapping is based on the discretization of individual model surfaces. To do this, the sensory map is split for each consumer into two regions of either preference or rejection according to the consumer's "preference threshold". The mean of each individual's liking scores is usually chosen as the preference threshold for the discretization. This choice is however arbitrary and other thresholds, such as the median of individual scores may also be chosen. In this study, we tested the effect of setting the preference threshold to stricter levels, namely to the upper 40%, 30% and 20% of the scored products. These possibilities have been tested on data from a preference mapping study of French cheeses, carried out with 10 products and evaluated by 486 French consumers on the one hand, and analyzed by a trained sensory panel on the other hand. The results show two consequences of raising the preference threshold: first, as could be expected, a decrease of the overall percentage of preferences in optimal sensory regions; second and more intriguing, a clear shift of the optimal sensory region is observed. Interestingly, this shift could not be fully anticipated by consumer segmentation achieved using hierarchical cluster analysis of hedonic data. Further analysis of each consumer cluster shows different patterns of evolution of the preference map when raising the preference threshold to 30%. The implications of this new type of preference analysis for optimization strategy and product development will be discussed in the presentation. These changes in the preference threshold also raise the question of the definition of preferences when liking scores are asked to the consumers.

Keywords: preference threshold, quadratic modeling, sensory characteristics, product optimization

(487) An Improved Constructivist Kanse Engineering Methodology

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This paper is excerpted from a project titled, 'Designing and Implementing an Artificial Design Tool Based on Improved Kansei Engineering' which was prepared by the authors. The project ultimately led to a developed model for Kansei Engineering (KE). This paper explains the weak points of the conventional KE methodology encountering culturally unfamiliar complex objects and products; it also presents the improvements implemented on the method in order to overcome these notable insufficiencies. A set of various techniques, methods and tools reported to exemplify the objectives include: Genetic Algorithm, Analytic Hierarchy Process, Mood Boards, and Product Personality Profiling. The developed model was later called, 'The Constructivist Kansei Engineering,' which proposes some modifications on a model based on Dahlgaard's work. It helps to intensify the expert designer's role (by applying AHP), meanwhile supports the importance of the inter-segmental familiarity, integrity, unity and structural aspects of the design as an object and a product. For the latter goal, a new term has been added to the KE terminology designated as the, 'Theme of Design' (TD).This TD is defined by designers based upon their feedback and perceptions during the procedure of design. By extracting a TD through communicating with the target group and also respecting the main objectives of the project, not even the designers will be able to converge the whole groups' preconceptions, but also they will be able to go beyond the conventional KE functions and set up a desired context (the missing part in KE) for the near future.

Keywords: Intelligent Design Tool, Constructivist Kansei Engineering Model, Theme of Design in Kansei Engineering, Culture-Center Design, and Improved Kansei Engineering

(115) Fashion and Emotion oriented Computerized Garment Design

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In garment industry, the fashion design features can be generally divided into two spaces: design space including a set of basic sensory criteria and brand space including a set of emotional fashion themes. The study of the relationship between these two spaces enables to identify the target market related to the predefined brand image of products. In practices, such relationship can be characterized through the similarity between sensory criteria and fashion themes according to the perception of consumers. In this paper, we propose a method for estimating such similarity. This method is compared and cross validated with Principal Analyze Corposant (PCA) through a case study of T-shirt products design. Such method can effectively help the designers to determine the suitable design components to represent the desired emotional fashion themes.

Keywords: Consumer's emotional behavior, garment design, fashion appearance, human evaluation, brand image

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(486) Fashion Design Education to Create New Feeling

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In the education of fashion design it is important how and what educational support will be effective to the encouragement of sensibilities are discussed. To investigate characteristic profile of creative student some subjective research has done for students who study fashion design in the college, Gifu City Women's College (GCWC), and technical college, Nagoya Fashion College (NFC). And several students who made some creative works in GCWC are divided from the students at large – GCWC create. Then analysis was made for three groups. As a result some characteristic profile for the creative students.

Keywords: Fashion Design, Education, Creative Works

(503) The possibility of predicting luxury brand
Lanvin, Balenciaga as examples

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There is a strong tendency within the Japanese apparel industry to use the trends presented at Paris and Milan fashion weeks and then manufacture and design clothes that incorporate these trends. In other words, the Japanese apparel industry is a trend follower. As a result, the Japanese apparel industry is not contributing towards globalizing the broader apparel market. Brands originating in Japan that export to the world are not strong in design. In order for the Japanese apparel industry to globalize, it is important to take in to account creation that introduce new designs to the world. This study is focused on ready-to-wear (hereinafter referred to as 'pret-a-porter') luxury apparel, and examines the possibilities of predicting the pret-a-porter designs of clothing suitable for sale in Paris and Milan. It is important to understand the present conditions of fashion houses which is, in fact, distributing original designs to the world. We elected to make studies of Balenciaga and Lanvin in order to gain an understanding of the inner workings of fashion houses. It also investigates, and makes forecasts, for designs which will be presented at Lanvin 2010-11 Autumn/Winter Collection. This paper is an interim report on the progress of this endeavor.

Keywords: fashion, luxury brands, design management

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(337) Aesthetic Experience and Comfort: *'Garment Design Integrated with Movement Qualities, Dynamic Bodily Expression, and Emotion'*

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This research investigates comfort factors of users' aesthetic experience, in particular emotional and aesthetic experiences that enhance wearability. The aim of the research is to develop concepts of movement-based interaction for inducing emotion, focusing on clothing as an interactive object. The more specific aim is to explore how to integrate movement qualities, bodily expression and emotion in garment design. The research utilizes the technique of scenarios to analyse the relationship between emotion and movement and garment. Garment has been developed for the participant as a prototype under the concept of shape change, 'Transe-For-M-otion.' The results indicate that, when wearing clothing in the context of comfort, the participant used her clothing to wrap or hold her body for the purpose of "protecting," "hiding," and "disguising" in insecure situations (feelings associated with relief and security), and conversely, for "self-expression" in secure situations (feelings associated with pleasure and enjoyment). In addition, the participant seemed to have her own ideas and gained great enjoyment by manipulating the garment in an interactive way with her body. The sense of movement, which refers to trace or the positional history of human motion, is closely related to space.

Keywords: aesthetic experience, comfort, movement, clothing

(292) Influence of Familiarity on Emotional Responses to Natural Scene Ads

A Study of Kansei in Japanese Advertising

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This kansei study explored how familiarity to associations of ads' visual and verbal components influence emotional responses. Stimuli were obtained from Japanese printed advertisements, and consisted of visuals (i.e. a natural scene) and their corresponding headlines (i.e., advertising copy). At first, a group of subjects evaluated their familiarity level to visuals and headlines, and stimuli were filtered based on results. In the main experiment, a different group of subjects rated their familiarity to the association of visuals and headlines on a Likert scale, as well as their emotional responses (arousal and pleasure) using the pictorial assessment technique SAM (Self-Assessment Manikin). Results showed high correlation between familiarity and pleasure, yet low correlation between familiarity and arousal. The characteristics of the stimuli and their effect on the variables pleasure, arousal, and familiarity, were explored through ANOVA. It is suggested that, in the case of natural scene ads, familiarity to associated visuals and headlines may increase pleasure level to ads, and that certain components in the visuals (e.g., water) may increase arousal levels.

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Keywords: Advertising, Association, Emotional Responses, Familiarity, Kansei

(264) Pose generation system expressing feelings and state

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A pose generation system expressing feelings and a state is proposed in this paper. This system generates a pose in accord with the image that the user wants to make, and it outputs avatars with the pose. The operation of the system is very simple, and the generation of the high quality avatar with pose is possible. First the user chooses some onomatopoeia which is near to the image of the pose that wants to create. Onomatopoeia are words that sound like the objects they name or the sounds those objects make. The system determines the initial values of the parameters to constitute a pose from chosen onomatopoeia. And various poses are generated by genetic operations based on the initial values, and they are shown to the user. Then the user selects and evaluates a favorite poses, and the system learns the image of the user based on the evaluations. In this way, interactive genetic operations are performed and more and more suitable poses are generated. Furthermore, the addition of the expression to the pose is possible: an expression and various feelings / state expression by the pose are realized. A viewpoint can be moved freely on the screen. Expression by the pose and the effectiveness of the proposed system are confirmed through evaluation experiments.

Keywords: Pose generation, Kansei, Onomatopoeia, avatar

(419) Does body movement affect the player engagement experience?

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Full-body controllers have recently become a regular feature in the gaming industry. Presumably, the idea has been to create a more natural and engaging experience in the players and perhaps to make it accessible to a larger population of users. Indeed, it has been shown that body movement supports cognitive processes, regulates emotions, and mediates affective and social communication. As such it is a very important communication channel that technology should exploit for achieving a more positive user experience. This raises a number of research questions among which are: can body movement as an interaction modality affect or change the quality of user experience? And, how should technology be designed to support such modulation process? This paper aims to propose and discuss a model of the relationship between body movement, controller type and quality of engagement based on the lessons learnt from the author's previous attempts to explore how body movement required and afforded by new game controllers affects the quality of the player's experience. The discussion is grounded into and supported by the literature on the regulatory properties of body movement on emotions.

Keywords: Body movement, Engagement, Computer Games, Affective states, Social engagement

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(473) Modelling Non-Acted Affective Posture in a Video Game Scenario

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How people experience affect and emotion, both in conveyance and recognition, at least partially determines how they interact with others, how they perform in their jobs, as well as how they carry out general day-to-day activities. A lot of diverse technologies have become part of working and social life, hence it is crucial to gain an understanding of whether recognising the affective state of the user may be added to increase the technologies' effectiveness. In this research, body posture has been chosen as a modality to recognise affect in the user. The rationale behind this choice is threefold: i) recent studies in neuroscience, psychology and cognitive science have shown the importance of body posture as an affective communication modality; ii) body posture has been rather unexplored as an affective modality in the computing field; and iii) technology is becoming multimodal with an emphasis on controllers that afford and require natural body movements as one of the interacting modalities. The study presented in this paper aims at recognising non-basic affective states from non-acted body postures in the context of a video game situation with a full body controller - the Nintendo Wii. These expressions are typically more subtle and more complex than acted expressions. Different from a lot of the research in this field, human observers are used to determine the ground truth of the affective postures. The reason for this is that most of the other research uses professional actors who are able to purposely use their bodies to express strong and clear emotions. Other methods such as self-report have been shown to be fairly unreliable, and physiological assessments of affect are reliable only for certain types of affective states (e.g., levels of stress or frustration). An online posture evaluation survey was conducted using affective body postures collected with motion capture systems. The postures are reconstructed as faceless humanoid avatars and presented for classification by human observers. The agreement levels and reliability ratings between the observers are calculated after which a repeated sub-sampling validation method is implemented for determining agreement levels between subsets which are used to create a set of benchmarks. Automatic recognition models are then built and tested for their ability to generalise to both new observers and new postures also using repeated sub-sampling validation. The input to the automatic recognition software is the numerical output of the motion capture system (i.e., the position of each joint in the three-dimensional space) to create a low-level description of the configuration of the postures. Finally the recognition software maps these descriptions into affective states using mapping models. The automatic recognition models are then compared to the benchmarks to evaluate the automatic models' recognition performance. The results are encouraging. As discussed in the literature, non-acted affective postures are more difficult for human observers to categorise. However, human agreement levels in this study are above chance level and the automatic recognition models achieve recognition percentages comparable to the benchmarks.

Keywords: affective posture, automatic emotion recognition, human emotion recognition

(415) Emotional contagion in interactive art

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The study reported in this paper is part of a larger project, Chameleon, that through a multi-disciplinary collaboration investigates the scientific foundations of emotional contagion, transforming it into an art experience. The aim is to create an emotional bond with the audience and to trigger reflection on emotions. The Chameleon art installation uses facial expression recognition technology to detect the emotional state of the audience and responds using a simple emotional contagion response mechanism and a video portrait selected in real time from a database of emotional video portraits built by the artist. In this paper we evaluate the ability of Chameleon to induce a need for emotional introspection and reflection in the audience. For this aim, an art exhibition was installed with emotional video portraits projected on different walls. The audience was told that the artwork was able to read their emotions and to respond to them while they were walking around the space. Visitors of the exhibition were invited at the exit to participate in the project by being interviewed. Semi-structured interviews were carried out and grounded theory was used to formally analyze the recorded interviews. The results showed that the audience was able to emotionally engage with the expressive portraits often by feeling that an emotional communication loop had emerged. The results also shed light on how this type of technology and the environment in which it is demonstrated could be improved to facilitate the communication loop to take place. The paper provides a detailed discussion of these results.

Keywords: affective computing, experience evaluation, emotional contagion, facial expression recognition

(347) P300 and Response Time from Color-Emotion Stroop Task

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Objectives: The event-related potential (ERP) of color-emotion stroop recognition task is made to study whether color could invoke physiological response. Methods: 52 different colors chosen from LCH color space are displayed on the screen, and 20 healthy college students are asked to report their emotional responses to each color. Then their emotional responses to each color stimulus are averaged. 3 colors, with highest, median and lowest averaged valence representing positive, neutral and negative emotion respectively, are chosen as the background color of 3 kinds of facial expression exhibiting happy, neutral and angry emotions. The expression pictures are covered by different color with 90% opaqueness. The color-emotion Stroop paradigm is designed to study color's effect on the same expression. The EEG is used as physiological measures. Another 18 subjects who have the same color preference as the previous ones are required to identify the expression and to ignore the color. Result: The LSD results reveal that there are significant differences between the RT under the positive and neutral color on happy expression, that of the positive and neutral color and that of the positive and negative color on neutral or angry expressions. Furthermore, on neutral expression for P300 amplitude, the differences between the positive color paired with neutral color on the electrode F6 and F8, the neutral paired with negative color on AF4, AF8, F8, and FP2 are significant. However, no significant differences are observed for P300 amplitude and latency on happy and anger expression at these electrode sites. Conclusions: There are strong activities from 200 to 400 ms, while the 5 electrode sites (AF4, AF8, F6, F8, FP2) are located in the forehead, which have the significant difference on P300 amplitude on neutral expression, this might be an indication of the forehead managing the emotional color-expression conflict. We conclude that the color might cause human physiological response.

Keywords: color-emotion stroop, Event-related potential, P300, Response time

(316) A study on an analyzed method of the emotional images of products

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This paper describes an analyzed method of the emotional images of products using the correspondence analysis and the formal concept analysis. Participants were asked to answer questions of 15 emotional images of 10 electronic dictionaries. They were 12 university students (male:5, female:7). The emotional image terms are as follows. 1) modern, 2) classic, 3) simple, 4) nicely-shaped, 5) a sense of luxury, 6) easy to see, 7) strongly-built, 8) multifunctional, 9) new, 10) highly individualistic, 11) colorful, 12) attractive, 13) imposing, 14) decorative, 15) cute They put a mark on a questionnaire when they felt an emotional term suited a product. The frequent data of the questions were analyzed using the correspondence analysis and cluster analysis. 3 groups were classified. A group: 1) modern, 4) nicely-shaped, 5) a sense of luxury, 7) strongly-built, 9) new, 10) highly individualistic, 11) colorful Product (b)(e)(j) B group: 3) simple Product (a)(c)(f)(g)(h)(i) C group: 2) classic, 6) easy to see, 8) multifunctional Product (d) As the terms of 12) attractive, 13) imposing, 14) decorative, 15) cute were low score, they were not used in the analysis. From the results of A group, the “nicely-shaped” needs “modern” and “a sense of luxury”. From the results of B group, the “simple” is a very common emotional term. After analyzing, the relationships between the emotional terms and the products were analyzed using the formal concept analysis. The frequent data of the questionnaires were changed into the binary data(1 or 0) for the formal concept analysis. If the frequent data is more than half (6), then it’s changed into 1. The formal concept analysis shows the relationship between the products and emotional terms from viewpoint of the attribution implication. The results of the formal concept analysis based on the concept lattice show the following information. (1) “modern”, ”nicely-shaped”, ”classic”, ”simple and “multifunctional” are very common terms for the electronic dictionaries. (2)“modern” and “ nicely-shaped” contain “a sense of luxury” in 2 products. (3)“classic” and “multifunctional” contains “nicely-shaped” and “ easy to see” in one product. (4)“nicely-shaped” and “multifunctional “ contain “classic” and “ easy to see” in one product. (5)“a sense of luxury” contains “modern” and “nicely-shaped” in 2 products. (6)“easy to see” contains “classic”, “nicely-shaped” and “multifunctional” in one product. (7)“strongly-built” contains “modern”, “ nicely-shaped” and “ a sense of luxury” in one product. (8)“new” contains “modern”, “ nicely-shaped”, “ a sense of luxury”, “ highly individualistic”, and “colorful” in one product. (9)“highly individualistic” contains “modern”, “ nicely-shaped”, “ a sense of luxury”, “ new” and “ colorful” in one product. (10)“colorful “ contains “modern”, “ nicely-shaped”, “ a sense of luxury”, “ new” and “ highly individualistic” in one product. Designers can do emotional design based on the above-mentioned data. As conclusion, the correspondence analysis and the formal concept analysis provide a lot of useful information to researchers, developers, designers and so on in case of qualitative study like an emotional image.

Keywords: formal concept analysis, correspondence analysis, cluster analysis

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(474) Subjective evaluation experiment of air-conditioning sounds in a vehicle according to the differences between generations

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In this paper, we tried to evaluate sounds originating from the air-conditioning system in a vehicle from a viewpoint of sound quality. First, we investigated words that represent characteristics of the air-conditioning sounds. Next, we carried out a subjective evaluation experiment using the SD (semantic differential) method [2] for the air-conditioning sounds to subjects in various generations. In this experiment, we evaluated not only the SPL but also psychoacoustic parameters of the loudness and sharpness. Finally, we performed a factor analysis to determine major factors that represent characteristics of the air-conditioning sounds.

Keywords: air-conditioning sound, subjective evaluation, psychoacoustic parameter

(235) Natural stones and ceramic tiles imitations: comparison of consumers' emotional response using product semantics

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In the flooring and covering sector, ceramic tiling faces many other different materials competing for market share, like natural stones. More and more, technological advances allow ceramic materials to improve their ability to imitate natural stones. This factor jointly with the features inherent to ceramic materials (price, variability, availability, hygiene, etc.) involves a relevant competitive advantage. Therefore, manufacturers pursue obtaining reliable imitations of natural stones, trying to generate the same emotional responses. Present study is focused on comparing the emotional response generated by natural stones and ceramic imitations by means of product semantics. Eleven ceramic materials and six natural stones, including granite, marble and slate were used to configure the sample of products. A sample of twenty consumers evaluated the sample using 13 emotional semantic concepts. A question regarding product preference was also included to obtain the emotional concepts that have an influence on it. An analysis of variance has been performed with the type of flooring as a factor. It shows that there are significant differences between natural stones and ceramics tiles in seven emotional concepts. Ceramic tiles obtain higher scores in concepts such as innovative, comfortable and elegant. Nevertheless ceramic tiles have lower scores in concepts related to resistance and handcrafted. No differences appear in basic concepts as hygienic, practical and high quality. A binary logistic regression has been applied to analyze the product preference. It shows that three concepts have a significant influence on consumers' preference: comfortable, elegant and sober. It can be concluded that ceramic imitations differs from natural stones perceptions in some emotional concepts. Ceramic tiles improve the results of natural stones in the most relevant concepts related to consumers' preference. Nevertheless there is room for improvement in ceramics tiles. The main challenge is to improve the conveyance of messages of basic properties of coverings like resistance. Furthermore, ceramic claims widely used by manufactures such as hygienic advantage have not been detected by consumers. This fact should force manufactures to find the way to convey consumers such a crucial property perception.

Keywords: Product semantics, aesthetics, symbolic values

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(216) Interactive User Tests to Enhance Innovation
Application to Car Dashboard Design

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The development of new products that satisfy consumers' needs and preferences is a very important issue. To avoid flops, the control of the risks in product innovation and the reduction of the innovation cycles require valid and fast customer's assessments, for determining new products that effectively correspond to the customer's taste. In particular, the shape of a product is an important factor in the success or the failure of a product. Since several years, in various research fields, many works are dedicated to the design of shapes by the analysis of the user's perception. Kansei engineering for instance produced many tools and methodologies in this research area. The work proposed in this paper is in this context. It is based on the use of interactive users' assessment tests to enhance creativity, by the way of interactive genetic algorithms (IGA) for capturing users' responses. A set of parameterized designs, defined with a CAD system, are presented iteratively to the user to be evaluated by a graphical interface. This navigation in the design space may converge towards designs that maximize a subjective criterion, given in advance to the user. We describe in the paper the interest of this approach for the design of forms and the setting of design constraints. The proposed application concerns the design of "innovative" car dashboards (innovative has to be understood here as in agreement, according to the user, with a particular semantic dimension, for instance "compact", handy", …).

Keywords: interactive genetic algorithms, shape design, car dashboard, CAD models

(281) The Reasearch 0f The Allure Factors of the Travel around Taiwan Island via Bicycle

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Following the Lohas, Green Energy Saving and Rest on Weekends three topics. Leisure activity was already became a most importance area, especially the cycling is the popular in Taiwan, it can strengthen a human body significantly and reduce air pollution. Taiwan is a small island and it has an extensive road system making so it easy to travel from place to place, the government encourage people attending the Leisure activity of cycling. In increasing numbers, people are making the travel around Taiwan Island via bicycle. It's a fun and interesting way to explore the island .Why the making the travel around Taiwan Island via bicycle is fun? What's the allure in the travel around Taiwan Island via bicycle? In this study, we focus on the professional of making the travel around Taiwan Island via bicycle opinion and we use the EGM method to find the travel around Taiwan via bicycle's allure, than we make questionnaire to ask the 20 people had making trips around Taiwan via bicycle and 20 people have not shown their opinions of the allure factors. Finally the data of experiment were analyzed by Quantification method I and T-test. This study offered the designers the different point of views of users of the trips around Taiwan via bicycle and we can find some allure factors to design the product about the trips around Taiwan via bicycle. Keywords?Kansei engineering, Bicycle, EGM, Quantification method I.

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Keywords: Kansei engineering, Bicycle, EGM, Quantification method I

(395) A Systems Thinking Approach to an Activity Rousing Consumer's Buying Motivation

Focusing on "Kansei Information" in Pop Ads And Direct Mail

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This paper discusses causalities between kansei information and consumer buying behavior and actions a firm can take knowing that kansei information influences such behavior. We regard information transmitted through point-of-purchase advertisements (POP ADS) at retail stores as one of the factors that incentivize customers to make purchases. Our focus is on kansei information, which is the result of cerebral processing of information obtained through the five senses, leading to positive affect. Since 2000, we have conducted research into the effects of kansei information on consumer buying behavior in various industries in Japan. Based on observations of such effects as well as firms' marketing and sales activities, we have explored a way to build a systems dynamics model centering on the effects of kansei information. In this paper, we consider messages contained in kansei information through POP ADS and direct mail, explain causal relationships using a systems thinking approach, and construct causal loop diagrams. Making comparisons with the causal loops, we also examine a case study from an actual retail store which takes advantage of kansei information in an attempt to increase customer buying motivation.

Keywords: Kansei Information, Systems Thinking, Causality

(47) Measuring Interest and Price for Sensory Experience *Application to Hotels*

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Our study looked at the interest and expected price one would pay for a variety of experiences in a hotel. These experiences covered four different aspects of each of four of the five senses (seeing, touching, smelling, hearing). A total of 315 respondents evaluated experimentally designed vignettes, comprising a different combination of positive, pleasant sensory experiences that a hotel might offer its guests as a point of differentiation. Each respondent evaluated a unique set of these vignettes. The ratings to the vignettes were deconstructed into the contribution of each sensory experience as a driver both of interest in the hotel, and of relative amount of money one was willing to pay, versus a standard one night hotel cost. It is not the particular sense, but the particular experience that drives interest and amount willing to pay. Three mind-set segments emerged; Sensory seekers, Fragrance

Keywords: conjoint analysis, senses, mind-set

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(389) A Market Segmentation Process Based on Usage Context

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The analysis of customer's requirements and preferences is an important stage for product design. Due to limits of company's budget and marketing strategy, managers are always willing to choose profitable segments as target market segments for launching new products or redesigning of exist products. Prediction of customer demand of a given product in a given market segmentation is essential to enterprise decision model which involving demand model and cost model. So the precision of market segmentation, which determines the quality of demand prediction, becomes especially important. Market segmentation consists in defining homogeneous groups of customers and it is one of the building blocks of effective product or product family positioning. Products or services can no longer be designed and sold without considering customer needs and recognizing the heterogeneity of those needs. Various statistical techniques are available in order to identify market segments, among these, cluster analysis and latent class models. For the segmentation variables, traditional market segmentation methods always based on marketing attributes and demographic attributes of customer, or correlations between them. Severer product competition can fragment markets into multiple technical niches, becoming difficult to capture with traditional modeling attributes. As customers become more market savvy and markets continue fragment, current market segmentation model could greatly benefit from exploiting the rich contextual information that exists in customers' product usage. For example when the customer is experienced and able to imagine the probable performances of the product or service in regard to the future usage, traditional marketing segmentation methods are not as effective as they could be in driving an efficient marketing policy. In this paper, we begin by a general literature review of market segmentation method and usage context model in research. Next, we present the basic principles behind our general usage model and show how it may be integrated into a method of market segmentation. Finally, we apply the usage context integrate market segmentation method in a brief case study of cutting a wood board with a jigsaw tool in order to exemplify how usage context variables may influence segments. We conclude by reaffirming the utility of this integrated method and outlining the further research work that will be done in the future.

Keywords: Usage model, Usage context, Market segmentation, Cluster analysis

(525) Modeling of Human Interest in Products by Observing Behaviors of Customer in a Store

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This paper proposes a method for modeling the degree of human interest in products for sale by observing the behaviors of customers in a store. In this study, we observe human behaviors towards products in a ubiquitous environment and analyze the observed data using cluster analysis and rough sets to make a model of level of interest. We call our model the 'Action Interest model.' We confirm that the action interest model can measure the degree of human interest in a product, based on their behavior toward it, to an accuracy of 87%. It is also possible to detect the level of interest in a product in which a consumer shows interest but does not buy.

Keywords: KANSEI modeling, analysis of consumer behavior, ubiquitous environment, rough set, cluster analysis

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(509) Combinative Value Creation in Purchasing Behavior

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Consumers' daily purchasing behavior is used as an example, observing decision-making processes to determine the optimal combination of several product items. Heuristics focusing on combinative value were identified that lead efficiently to satisfactory decision-making.

Keywords: Purchasing behavior, Combinative value, Value creation, Decision-making

(40) Research into the Emotion Dimensions Revealed by the Colors of Beverage Packaging

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This study aims to explore the factors in distinct light colors of fluorescent lamps in stores that affect color presentation of the printing on beverage packaging, and conduct a first-stage survey of market. According to the survey result, two pilot tests are later conducted in stage two on the two design properties, 'color temperature of LED white light' and 'color scheme of packaging', and how they affect test participants¡¦ emotional cognition. After observing and analyzing the existing design samples, we had three findings: (a) For the trend of colors presented on beverage packaging in 'color temperature of fluorescent white light', 'high color temperature' (61.65%) is in the majority; in 'color scheme of packaging', 'analogous hue' (61.12%) is in the majority. (b) For the pilot tests of emotions for the colors presented on beverage packaging in 'color temperature of LED white light', 'medium color temperature' can best create positive valence (medium > low > high). For those in 'color scheme of packaging', 'analogous hue' can best create positive valence (analogous > contrast > complementary). (c) The comparison of current quantity and emotion survey shows the color presentation of existing beverage packaging is roughly consistent to consumers¡¦ emotional reactions. 'Color temperature of LED white light' and 'color scheme of packaging', proposed in this study as criteria for categorization on beverage packaging, will be able to clearly present design trend in the market. We hope this paper will make a contribution to the studies of presented colors on beverage packaging and consumer emotions.

Keywords: color scheme of packaging, hue, white-light LED, color temperature, emotion

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(513) Comparative study of Images associated with Japanese and English Color Terms

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Impressions for color terms both in Japanese and their translations into English were examined. University students participated in this research. The results showed some difference in impression of color terms among groups.

Keywords: Color terms, Image, Impression, Semantic differential technique

(246) Associating Color with Emotions based on Social Tagging

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Color is an important component to express emotions in images. The relationships between color and emotions have long been studied, both from artistic and psychological points of view. In this paper, we study the links that can be established in an unconstrained experimental setup, using a social tagging system that enables users to freely label images, without imposing any restriction regarding the label or the image choices. After collecting images labeled with emotion terms from the FlickR system, we consider both an objective color description of the images in the HSV color space, as well as a subjective semantic description, using images presenting color terms tags. The latter thus applies to images for which annotators underlined the importance of the chromatic content and leads to the identification of emotion characterization in terms of colors and reciprocally of colors in terms of emotions, although not in bijective relations.

Keywords: emotion detection, image processing, affective computing, machine learning

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(220) The New Implication of Ornament Design

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Ornament is one of the elements which have been taken into account within the field of products design. Deciphering effects from different ornaments will facilitate promoting the value and orientation of designed products. Furthermore, the way to achieve the goal of effectively manipulating ornaments through specific principles to escalate the aesthetic perception of products is an important topic as well. However, as time keeps moving forward, the definition of ornament hasn't been modified at all. The aim of the present research is to redefine the implication of ornament design through the investigations from different users. The present research has been operated within two phases, which are interview and questionnaire respectively. As the result, the dimensions of ornament could be extracted into five aspects: the specialty of aesthetics, the color of product patterns, the ratio of area, the material and the promotion of the sense of value. Ornament will also be able to offer users the visual joy of the gradation. Physical specialties, on the other hand, contain the color of product patterns, the ratio of area and the material, which illustrates that different particularity and orientation of products can be endowed with by making use of the design of physical specialties. After comparing with previous literature, we have found out that 'promotion of the sense of value is a new dimension which is a new definition of ornament in modern days.

Keywords: Ornament, Produces design, Miryoku engineering

(21) Preference measures of rectangle ratio on MBTI Personality Types

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Whether the golden ratio is the favorite ratio for people is a controversial research issue until now. The purpose of this study is to investigate whether oriental people in Taiwan have the preference to the western culture originated golden ratio and to find out how the personality affects ratio preference by using the MBTI (Myers-Briggs Type Indicator) test to classify people into different personality types. First, 120 subjects been classified into 16 identified personality types by the MBTI test were screened out from 195 subjects recruited in this study. After that, they were asked to estimate the preference to 15 horizontal and 15 vertical rectangles with varied ratios, respectively. The results of the study were summarized as follows: (1) The most popular personality types of the subjects are ISTJ and ISFJ types, while ENTJ and ESTP types are much less popular; (2) The tendency of preference to varied ratios can divide into three classes: people tend to like the ratio of a square, the preference to golden ratio is fair, and when the ratio increases to exceed the golden ratio will be gradually disliked; (3) The personality of a person does affect his preference to golden ratio. The V6, H7 and H8 ratios are liked by people with different types of personality, I type and T type people prefer V6, people of S type and J type prefer H7 and people of F type and J type prefer H8; (4) Women with non-designer background like golden ratio, but men dislike. Most designers prefer golden ratio. This result could be used as guidelines for product design and market position setting.

Keywords: golden ratio, MBTI, preference measures

(19) Creating Customer Experience and Hospitality at the Kyoto Long-standing Company Kyogashi-shi 'Suetomi'

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Kyoto, a sister city of Paris, France, is representative as a Japanese ancient city and a town letting you feel the history. In the Kyoto, it is famous for the unique Japanese culture that we called Tea Ceremony and Zen and there are many long-standing companies. We focused on the long-standing company of Kyoto so that we thought there is a relation between the unique Japanese cultures, the existence of the Kyoto long-standing company and the characteristic of their product. It is possible for the long-standing company to stand at the long-term, because they create a new customer value from their characteristic of the management. Therefore, this study aims to analyze the relation between managerial characteristics and customer experience for the long-standing company from the perspective of building customer experience, based on Suetomi's case. Also, we examine managerial characteristics to build customer experience using strategic experience modules, strategic implementation of such customer experiences and the five customer experiences management frameworks. Based on these analysis, we discuss the possibility of the long-term existence for the long-standing company and the connection of Hospitality for Japanese culture.

Keywords: Customer Experience, Hospitality, shinise, Kyogashi Master, Suetomi

(331) A Cross-Cultural Comparative Study of Thought Process Cognitive Diversity According to Regions and Mathematical Minds

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Contemporary designers are now factoring Kansei to meet their goals in the development of consumer products. We focused our attention on their recognition processes as a method to perceive the consumer's Kansei. The purpose of this research is to examine the cognitive diversity according to various regions and mathematical minds. We studied two different ways of recognizing images: attribute-oriented thought and relationship-oriented thought. Through fundamental experiment, it was found that 39 Japanese and 45 European subjects (33 Dutch and 12 English) had stronger tendencies in attribute-oriented thought than 45 Korean subjects. Despite regional similarities, the results for attribute-oriented thought of Japanese were much different from the results of Koreans. Next, we explored the mathematical minds (skill and interest) as other factors for creating attribute-oriented thought. 62 Japanese university students participated in this experiment. As results of experiment, there were no significant differences between mathematics-based majors and non-mathematics-based majors in attribute-oriented thought. However, when it comes to the case of students who were interested in mathematics, there was a notable inclination towards attribute-oriented thought compared to those who were not. Furthermore, the dissimilarities of attribute-oriented thought were bigger among males than females. The important findings of our research are that the cognitive inclinations of Japanese correspond greatly to the ones of European than the Koreans' inclination, and that the attribute-oriented thought of Japanese is driven by their mathematical interests more than their mathematical skills. Finally, we learned that mathematical interests could be one of the factors creating cognitive diversity, and that the cognitive diversity could be found more easily among males than females.

Keywords: Recognition Process, Mathematical Minds (skills and interests), Attribute-Oriented Thought, Kansei, Design

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(439) Japanese Onomatopoeias and Sound Symbolic Words in Describing Interpersonal Communication

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Nonverbal communications convey 'Kansei' information that explicit verbal communications fail to transmit. In this study, we surveyed how people perceive nonverbal communications involving physical contact by using Japanese onomatopoeias and sound-symbolic words. In the experiment, various pictures depicting two persons making physical contact were presented. Participants then answered questions, including one that required them to select the words that were the most suitable for describing the communication. We found that two frequently selected words expressed the activity of the motion of the physical contact, while two other frequently selected words described the atmosphere of the communication scene. The communication associated with the words describing atmosphere tended to be perceived more desirable than those describing physical motion. This might indicate that positive impressions of interpersonal communications tend to be associated with the scene or atmosphere. We also applied a principal component analysis (PCA) using adjectives for describing the communication, and mapped the desirability and onomatopoeias onto the constructed multidimensional feature space of nonverbal communications. The present results and additional analyses will reveal the detailed relationship between desirable interpersonal communication and words used to describe communication. Further, it will provide useful starting ground for designing user-friendly Kansei-communication systems.

Keywords: Nonverbal Communication, Japanese Onomatopoeias and Sound-SymbolicWords, Principal Component Analysis, Experimental Psychology

(171) Kansei Appealing of Balcony Design

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This study seeks to analyze the citizens¡¦ emotional perceptions towards differential balcony designs of City Yeast - balcony project in 2008 and its feasibilities for enhancing city attraction. ¡§City Yeast¡¨ is an urban activity which makes each Taiwan city and its culture unique and further becomes an attractive city by applying creativity. As a common facility in Taiwan society, balcony is always full of the blots on the city landscape. That is why they focused on this space and solicited the design proposals from citizens. For understanding whether City Yeast - balcony project in 2008 had the positive influence on city attraction, interview and questionnaire were utilized to compile opinions. Moreover, before the quantitative surveys, the experimental sample selection, definition of attraction and corresponding relationship between design images and Kansei vocabulary were defined by those respondents. The quantitative results conclude the attractive design factors and further evaluate whether City Yeast achieve its target.

Keywords: Kansei design, balcony, city attraction, City Yeast

2010

(108) The Study of Different User Groups Usage Needs in Living Space

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The trends toward more elderly and fewer children did change the family structure in Taiwan. There was more and more three-generation family. The elderly spent more time in living space, also needed to take some household duties. However, the living space interior design often neglected the elderly needs. According to the reference, the research found that elderly accommodated themselves to other family members easily and hard to be aware of the living problems by themselves. These showed the lower awareness and needs of the elderly and the different requirements between them and regular people. The research aimed to two different user groups' usage problems and needs in living space, hoping to find out a better living environment that suitable for different group users.

First, the research sorted usage behaviors into six classifications according to the literature review results, then, designed a "user questionnaire" for the experiment of user groups' problems and expectations in living space. Analysis aimed to compare the different results of problems, needs, and expectations between two group users in living space. We hoped to set up design guidelines for new built or rebuilt living space and provided a better living space for different group users lived together.

Keywords: Living space, Usage behavior, User group

(154) CARTOPTI: A Tool for Automotive Seat Conception Using Regression Models and Customers Studies

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The main purpose of our study is to propose a tool for automotive seat conception. Automotive seat comfort is usually a matter of technical experts. These specialists have not only technical skills but also a wide knowledge of our customers. They design Renault seats taking into account customers expectations and technical constraints. This approach has some limitations, well known by sensory scientists. One of the difficulties is the need of an iterative process to design seats: new seat proposal, tryouts, improvements, new seat proposalâ€¦ The number of different seats increases each year as we have to reduce the number of expensive prototypes. Thereby, we suggested that the experts enhance their approach with Preference Mapping. Preference Mapping is one of the methods used in Sensory Science to establish relationships between sensory and customers' data in order to understand customers' preferences. This methodology is based on regression of each consumer's preference scores with the two first axes of a PCA with sensory attributes as variables. We selected 9 seats with quite different sensory properties. 120 customers evaluated those seats. We used pressure measurements which take into account the interaction between the seat and the participant, as sensory ones. We carried on the previous improvements on preference mapping techniques by developing some specific functions: to estimate a comfort score for any new seat prototype without conducting other customers' evaluation, to provide target values to define the characteristics of an optimal seat with or without constraints on the technical parameters.

Keywords: sensory science, preference mapping, instrumental measures, automotive seats

2010

(43) Kansei Engineering: A case study on Iranian youth people preferences in different classes of available automobiles

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The aim of this study is to establish a new design database for redesigning the current Iranian national automobile (Samand). In order to carry out this study, kansei engineering method was used. It is an appropriate method for linking users' emotions and product properties. Samand is the only national car in Iranian Automobile market. Although there are several models of this car, all of the current models are designed and produced in Sedan class. However, it seems there are some interests among Iranian youth in SUV and the other classes of cars. In order to perform the study, sixty women and sixty men between 18-35 years of age were selected randomly among young people. The six most popular classes of automobiles in Iran's market, including Sedan, Hatchback, SUV, Mini, Van and Coupe were presented as image boards in a showroom. Firstly the participators were asked to rank the six different car classes according to their interests. Then people explained their feelings about each board considering forms, sizes and comfort of use. The participators' reactions closely observed and their kansei words were gathered. By analyzing gathered data, the Iranian youth people feelings about each class of automobiles were identified and their preferences were obtained as design characteristics. The results showed that both women and men were more interested in SUV car class. They had special feelings about this class due to its design characteristics. The results of this study became a new design database for redesigning the national Iranian automobile.

Keywords: Kansei Engineering, feelings, preferences, car classifications, Automotive Design

(514) Development of Image Retrieval System Using Multiple Key Images

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Many image search systems, designed to search on only one sample image, share the following 3 problems: (A) Appropriate search results can be expected only when users have images at hand which clearly possess characteristics they want. (B) The same search results are presented when searched by the same images, even if image characteristics intended by users vary. (C) Characteristics which are difficult to express, such as the general color tone and texture, cannot be defined as search keys. To solve these problems, we developed an algorithm to extract common image characteristics from multiple sample images and to estimate likely searches. We developed 3 prototype image search methods: using multiple sample images as a search key, explicitly highlighting details wanted by users, and estimating characteristics wanted by users from among multiple sample images presented. We evaluated these systems on a database of 1500 landscape images and obtained good results.

Keywords: Image Retrieval System, Multiple Images, Graphical Feature

2010

(448) Generation of scene frame of Manga from narrative text

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Manga is the Japanese term of comic and is used in this paper. Recently Japanese Manga has been paid attention to. For example, International MANGA Award is established by Japanese Ministry of Foreign Affairs in 2007, the establishment of museums for Manga is planed in several countries and in fact some museums are established. From this background, some automatic generation systems or some drawing support systems of Manga are studied using a computer. However, the study on the generation of Manga from narrative text is not found yet. The final purpose of the presented study is the automatic generation of Manga from narrative text using a computer. This paper aims at the scene frames generation for automatic Manga drawing from narrative text as the first step of the study. The scene frames generation for automatic Manga drawing from narrative text as the first step of the study. The scene frames generation is an important work in which pictures as contents of Manga are considered and scene frames locations and their sizes are determined as the design blueprint of Manga. In fact, if good Manga contents are not drawn, scene frames sizes are not assigned well and/or if scene frames are not arranged well, Manga becomes complicated and reading Manga is not fun for readers. In this paper the procedures of the scene frames generation are studied, which consist of the following four steps: (1) the preparation step of inputted narrative text, (2) the step of scene frames generation, (3) the step of scene frame importance calculation and (4) the step of scene frames assignment/arrangement. In step (1) morphological analysis and parsing are performed for inputted narrative text, and nouns and verbs are extracted. In step (2) scene frames are generated based on verbs expressing character's action. In step (3) three kinds of importances, the sentence importance, the main story importance and the importance of the first appearance of a character in story, are calculated. In step (4) generated scene frames in step (2) are assigned and arranged in Manga based on importances calculated in step (3). Two kinds of experiments are performed for validation of the usefulness of the proposed method: (a) the comparison of scene frames obtained by the proposed method and those obtained by 5 subjects, and (b) 10 subjects evaluations of scene frames generated by the proposed method. Experimental results show the followings. (I) The proposed method takes much shorter time to generate scene frames than human subjects. Therefore, it is found that the proposed method is helpful to generate scene frames for users who try to draw Manga. (II) The good size of each scene frame is obtained and generated Manga has enough information for reading and understanding inputted narrative text. Therefore, it is found that the proposed method calculates each importance well and generates Manga well. Finally this paper mentions future works such as the consideration of the method to estimate redundant scene frames and to deal with them.

Keywords: narrative comprehension, comic (manga), scene frame importance degrees, character's action

(343) Research of the Different Emotion in Different Driving Purpose and Position in Car

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Nowadays the society admires the automobile as the transportation vehicle day by day. The emotion initiate in the vehicle often affect the mood of the entire journey even the following traveling schedule. Changing the disposition and the atmosphere of the vehicle appropriately, will be able to reduce the negative mood form disturbance; bring out and maintain the condition with positive mood. In view of the mood in the vehicle, this research is discussing that if it would present the specific mood in different driving goal with different driving position. Therefore to investigate the correspondence between the different riding condition and the mood, the investigation is supposed as follow: First, riding conditions could be divided into four kinds, "the commuting goal driver seat, the commuting goal assistant seat, the sightseeing goal driver seat, the sightseeing goal assistant seat". Second, the mood vocabularies are divided into the positive mood—relax, enjoyment, joviality, excited, pleasure, and cheerfulness; the negative mood—alarm, worry, uneasiness, anxious, tenseness, not comfortable…etc, respectively. Third, discussion of the corresponding relationship between riding condition and the mood by using network questionnaire, and analyzed with Analyzes of Variance(ANOVA). The results are: Separated by riding goal can obviously see the tendency with "the sightseeing - happy/commuting - anxious"; Separated by riding position can see "driving - alarm/ riding - relax" phenomenon.

2010

Keywords: Emotion, Cogniton, Quantification Theory Type 3

(404) The Role of Emotions as Antecedents of Cognitive Assessment in the Evaluation of Incremental Versus Really New Products

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The study of emotions in the innovation adoption process has received increased attention in the new product development and marketing literature. We explore in this paper the role of emotion as an antecedent of utilitarian and hedonic benefits. The model was tested with a national representative sample of the French on-line population composed of 1516 individuals. Results validate the role of emotion as an antecedent of functional and hedonic benefits and show that their impact varies according to emotion valence. Our paper presents one of the first empirical validations of emotion influence in the innovation adoption process.

Keywords: Innovation adoption, Emotion, Novelty degree

(144) Affective Multimodal Integration of Visual and Tactile Textures

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An experiment is reported that demonstrates that affective responses to visual and tactile stimuli, at least within the context of this experiment, are integrated by weighted averaging. Other research has shown that people integrate multimodal information according to different mechanisms, such as additive, super-additive and by maximum likelihood estimation. This experiment was carried out to determine the integration mechanism for visual and tactile textures, which were required to build a computational model predicting affective responses to visual and tactile textures. Twelve plaques made of laminate board with four visual textures and three tactile textures in all combinations were made. Twenty six participants rated the combined stimuli semantic differential scales against six words: natural, simple, rough, warm, like and elegant. Participants also rated the visual textures separately without touching them, and the tactile textures without seeing them. Analysis of variance was used to determine whether the scores of the stimuli combinations were independent. The results show no evidence of interaction between visual and tactile stimuli for all the words except natural; people's responses to the visual textures do not generally depend on the tactile textures they are presented with. By considering the scores of combined stimuli to scores of stimuli only touched or only seen, it is shown that people's integration of visual and tactile stimuli in this context is most likely by weighted averaging. We speculate that the deviation from the weighted average model for the word natural is due to congruency effects.

2010

Keywords: multimodal effect, touch, vision

(153) Machine Vision Approach to Predicting Affective Properties of Tactile Textures

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Although there has been much research on the perception of roughness, it is not yet fully understood. Further, there is almost certainly more to the perception of tactile textures and patterns than roughness. An experiment is reported that aimed to identify the topographical properties of tactile textures that affect people's affective responses when touching them. Twenty four tactile plaques were manufactured. The textures for the plaques were copies of visual textures in which the grey scale was converted to height, or were copies of existing tactile textures. The plaques were made using rapid prototyping techniques to manufacture stamps, which were then used to impress the textures onto laminate board. The textures were chosen on the basis of variety of affective response in the visual domain and for subjective tactile variety. In a novel application, texture measures, originally designed for the machine vision domain, were used to characterize digital representations of the tactile textures. These measures are based on concepts such as co-occurrence matrices, grey level run length and absolute gradient. To obtain the affective ratings, the plaques were touched, unseen, by 107 participants who scored them against 20 adjectives on a semantic differential scale. The texture measures computed for the digital representations were regressed against a subset of the participants' affective ratings using a novel feature subset evaluation method and a partial least squares genetic algorithm. Five measures were identified that are significantly correlated and are unlikely to have occurred by chance. The next step will be to manufacture plaques with systematically controlled features to determine whether the regression model correctly predicts people's affective responses.

Keywords: tactile perception, texture analysis, wrapper methodology

(152) Predicting Affective Properties of Tactile Textures Using Anfis Modelling

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A technique commonly used in Kansei Engineering to map affective responses to physical properties of products is to administer a semantic differential questionnaire and analyze the results using multivariate regression. A widely acknowledged problem with this approach is that the statistical analysis techniques are not permissible for the non-linear, ordinal data produced by the scales. To address this limitation, this research assesses the use of Adaptive Neuro-Fuzzy Inference Systems (ANFIS) to simulate and analyze the mapping between the physical properties of tactile textures and people's affective responses. Eighteen people were asked to rate the tactile feel of thirty seven textures against six pairs of adjectives on a semantic differential questionnaire. The friction coefficient, average roughness and a thermal parameter of each surface texture were measured. Using collected data, ANFIS models were built to predict the affective responses to tactile surface textures. The resulting ANFIS models always yielded lower errors when compared to regression models and demonstrated a good match between predicted and actual responses. The use of ANFIS models could provide more insightful information than traditional statistical analysis techniques for product designers, in the form of 2D and 3D data plots of affective response, or in the form of fuzzy rules.

Keywords: Affective Engineering, Touch, Neural Networks

2010

(175) Emotion Measurement: A Proposal for measuring User's Kansei

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Product design that provides aesthetic appeal and pleasure can greatly influence the success of a product. To create pleasant and good design, the designer has to balance between objective and subjective properties of a product, between usability and emotional expressiveness, between information and inspiration. User's Kansei is one of the most important tools to create pleasant products. The terminology of Kansei is imbedded in Japanese culture. It allows us to pay attention to the behavior and responses of people before, while and after their interaction with the products. The main objective of this study is to show and discuss a new method for interpreting and measuring user's Kansei before and while using a product. To achieve this aim, an experiment was carried out with 12 healthy people (in ages ranging from 20 to 28 years old) at a laboratory in Kyushu University. A coffee- maker is selected as case study. In the experiment, the authors focused on measuring and analyzing three elements: a) internal emotional and physical responses, b) user's facial cue, and c) words "spoken". The following tools were used to measure the above three elements respectively; Kansei sheet, digital camera, and user interview. Kansei sheet is a new tool proposed and used in the experiment in order to convey Kansei information regarding the visual appearance of a product and its usability to a designer. It is used for measuring qualitative and quantitative components that all emotions (including positive and negative) have. This study demonstrates the followings: 1) While there are many tools to measure emotions, most of them have limitations as they can be difficult to use and costly, and most require specific skills and additional evaluation time. Kansei sheet is an effective tool to understand user's emotions clearly and without losing much time, effort and money. Furthermore, users with different abilities can use and understand it easily, without any help. 2) In some cases, the outward facial and body expressions of a user are different from his/her true internal emotional responses while using a product. The new proposal enables a designer to interpret and measure user's kansei precisely and easily. 3) Measuring emotions that are evoked by interacting with the products is not only important for discovering which particular emotions are evoked by a set of stimuli but also for understanding why those stimuli evoke these particular emotions. In developing new products, this data/information is used to make decisions on the properties of a new design. The present study will be of interest for design educators and decision makers.

Keywords: emotion, user's Kansei, design tool, product design

(61) Measurement of "wakuwaku" feeling generated by interactive systems using biological signals

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To evaluate the Kansei of interactive systems, subjective evaluation methods such as questionnaires are commonly used, even though they suffer from the demerits such as linguistic ambiguity, interfusion of experimenter and/or subjects's intention to the results, and interruption of the system's stream of information input/output. Solving these problems is crucial to evaluate the degree of interest and/or excitement of a constructed interactive system, to identify the moment of excitement and so on. Evaluating the Kansei value of an interactive system only by such subjective evaluation methods as questionnaires is almost impossible. We began our research to objectively evaluate interactive systems by quantifying sensations using biological signals offers the following merits and can supplement the above questionnaire demerits: We previously utilize biological signals, EEG alpha waves in this case, to estimate subject feelings of relaxation. In this article, we focused on a type of sensation called wakuwaku, which is a Japanese word for a positive sensation derived when someone feels something exciting or captivating. "Waku" means outwell. Some research has focused on emotions using biological signals. However, most has treated mental stress or simulator sickness, which are considered negative sensation. Moreover, some research on non-negative sensations treated relaxation or comfort, which are considered static compared with the dynamic wakuwaku feeling. Thus, little previous research exists on such dynamic and positive feelings as wakuwaku. Then, the purpose of this article is to clarify the relation between the dynamic, positive feeling of the wakuwaku sensation and biological signals. We constructed various systems base on a game of choosing treasure box to evaluate their degrees of wakuwaku. Parameters of these systems were the design of boxes and sound, BGM and effect. To evaluate the wakuwaku degrees of the constructed systems, questionnaire related to wakwaku feeling and biological signals such as Garvanic Skin Reflex (GSR), heart rate, and breathing rate, were employed. Experiments were performed with twelve male students in their twenties who served as volunteers. The result of analysis of variance for questionnaire shows that the main effect of sound is significant for almost all questionnaire items such as exciting, joy. On the other hand, the main effect of the design of boxes is not significant for almost all items. As for biological signals, the heart rate at the moment of choosing the box to be open is significantly different between the systems with different design of boxes. On the other hand, the heart rate at the moment is not significantly different between with-sound and no-sound. However, the average of GSR at the final moment of transformation of several models is significantly different only between with-sound and no-sound. From these results, it is suggested that heart rate and averages of GSR may show the wakuwaku feeling of users of interactive systems. Moreover, the results of questionnaire may reflect the impression of final moment of the interactive systems.

Keywords: wakuwaku feeling, excitement, biological signal, interactive system

2010

(480) Extending the concept of satisfaction in ISO standards

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Traditional approaches to usability based on the definition in ISO 9241-11 in terms of user performance and satisfaction have been criticised as too narrow. The concept of satisfaction, defined as comfort and acceptability of use in ISO 9241-11, has been broadened in the new system and software quality model in ISO/IEC FCD 25010 (which replaces ISO/IEC 9126-1) to include achieving pleasure through the attainment of hedonic goals and the experience of use. Satisfaction is broken down into four sub-characteristics: purpose accomplishment, trust, pleasure and comfort. The new definition should promote a broader interpretation of satisfaction.

Keywords: usability, satisfaction, quality in use, standards

(273) A wearable interface for reading facial expressions based on bioelectrical signals

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his paper proposes a novel method to read expressions on the human face through an unobtrusive wearable device by applying computational methods to bioelectrical signals captured on the side of the face. The captured signals are considered to be a mixture of distal electromyographic signals and other biological signals and can be used to achieve a personal, pattern based identification of the facial expression. Over 90% accuracy of facial expression recognition was ascertained using this method even when presented with cross-talk from other muscles. We have been developing a wearable device, called Emotion Reader, which was not only able to identify emotional facial expressions in real-time but also to display the emotion in a continuous manner.

Keywords: Facial expression, Emotional behavior, Electromyography, Non-verbal communication, Wearable interface

2010

(66) Virtual Character's Emotional Persuasiveness

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A growing interest in using virtual characters expressing emotions and used to embody some roles typically performed by humans (as for example the role of announcer or tutor) has been observed in recent years. As humans, in some situations, such virtual characters should be persuasive to try to convince the other during an interaction. Recent research in Human and Social Sciences has shown that the expressions of emotion can be used to convince someone else in a negotiation. The expressions of emotion may then be used to improve virtual characters' persuasiveness. In the domain of virtual characters, most of the researches so far have focused on felt emotions of virtual characters while less attention has been paid to the emotions that a virtual character should express during an interaction to achieve specific goals. In our work, we focus on the emotions of virtual characters for the purpose of influencing someone else's opinion during a negotiation. Based on Human and Social Sciences theories, a model of strategic expressions of emotion to improve virtual characters' persuasiveness during a negotiation has been constructed. This model enables a virtual character to identify the emotion that it should express to try to convince its interlocutor. The type of emotion to express depends on one's interlocutor's social relations. Accordingly, rules have been defined to infer the social relation of the virtual character's interlocutor based on the expressed emotions. Depending on the inferred social relation, the virtual character determines the most appropriate emotion to display to influence other's opinion. Based on this model, we have developed an emotional persuasive virtual character in the 3D online virtual world ``Second Life''. In oder to illustrate the behavior of the emotional persuasive virtual character, we have developed another virtual character called impulsive emotional virtual character. The latter is a very simple emotional character that, contrary to the emotional persuasive one, expresses its felt emotions. In Second Life, the virtual characters that we have developed express emotions through two ways: their facial expressions and an object attached to their chest called EmoHeart. EmoHeart appears when the virtual characters express emotions, and its texture depends on the type of the expressed emotion. EmoHeart provides an additional channel for visualizing emotions in a vivid way while the facial expression of emotion in Second Life may be elusive. To evaluate the persuasiveness of the emotional persuasive virtual character, we have performed a users evaluation. A simulation of negotiations between the emotional persuasive virtual character and the emotional impulsive one has been presented to users. Three different emotional strategies have been evaluated. The results show that, as expected, the emotional persuasive virtual character is perceived as significantly more persuasive than the emotional impulsive one. However, certain emotional strategies appear as more efficient to improve its persuasiveness than others. In the full paper, we would like to present in more details the computational model of the emotional persuasive virtual character and the results of the evaluation.

Keywords: Emotional persuasion, expression of emotion, virtual character

(362) Negative Versus Positive Implicit Facial Expression Processing in Depressive Mood

The Link Between the Severity of Depression and Automatical Facial Expression Processing.

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Facial expressions of emotions are innate and universal across the cultures. The neural mechanisms underlying the expression and perception of facial emotion are "hard-wired" such as happy expressions innately appetitive (i.e. positive) stimuli, while angry or sad expressions innately aversive (i.e. negative) for humans. Accurate recognition of facial emotions is necessary for appropriate human social interaction. The implicit or automatic emotional priming effect can take place outside of the awareness and influence the behaviour differently than explicit presentation of emotional stimuli. Previous studies confirmed that different neural substrates responsible for the processing of implicit and explicit facial emotional stimuli. It was suggested that mood disorders are characterised by the higher sensitivity to negative stimuli and automatic thoughts. Automatic thoughts are cognitive products and they occur rapidly and the individual has limited control over them. In our studies we investigated the implicit processing of facial emotion stimuli in different psychopathology where commonly negative mood was reported on the explicit level. We used the affective priming task in order to compare implicit treatment of different emotions (sad, angry, and happy) represented on a schematic face. In the presentation we will discuss the differences between implicit emotional processing and explicit self report on emotions.

Keywords: implicit emotion, depression, facial expression

(489) TAKING INTO ACCOUNT THE CONSUMERS' EXPECTATIONS,PUBLIC HEALTH POLICIES AND FOOD PRODUCT DESIGN

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This work is part of a project of the National Research Agency, which includes nutritionists and researchers of different academic laboratories. The present paper introduces some methods used to identify and evaluate consumer needs and preferences. We also propose a model in order to find a compromise between consumers' expectations, PNNS (French national program of nutrition and health) regulations, technical and economical constraints of frozen pizza producers. Furthermore we want to represent and to weight consumers' expectations that will be used as inputs for a QFD (Quality Function Deployment) matrix. The suggested model is based on consumer research methods and proposes a field of product solutions that takes into account the different expectations. For that purpose, we consider a pairwise comparison test of pizzas with consumers in order to identify their perceptions towards these products. Afterwards, we propose another test in order to determine the importance of the pizza attributes. From these results and taking into account the recommendations of PNNS and their technical and economical constraints, the producers will generate models of pizzas. Later on, a tasting test with consumers is considered, so we can determine the set of preferred pizzas which will represent the intended field of the possible solutions.

Keywords: QFD, AHC, AHP, LSLR, Pairwise Comparisons

(336) The Application of Selective Sensitivity to Design
Focus on Visual Perception

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The human face is a complex multi-signal system from which we can infer a great deal of information at no more than a glance. Such information refers to age, sex, attitudes, personality traits, and emotion. Owing to the evolutionary significance of decoding facial signals, humans seems to have developed a selective sensitivity to the relevant features, and configurations, even if presented in rather abstract ways. Such information is encoded and perceived in car fronts. Previous researches come within the scope of this research by the subjects' gender. In consumer researches, gender is introduced as key consideration when segmenting consumer along the transactional/relational continuum with culture. It estimated that females determine 80% of consumption, purchase 60% of cars and own 40 % of all stocks as of 2008. Little wonder that female's consumption becomes more and more important in all over the industries. This research is on the process of aiming at exploring the application of human's selective sensitivity to design. Under the purpose, we investigated: 1) whether gender makes difference in visual perception: 2) if so, what stimuli showed the significant in subjects' gender and didn't. From the results: 1) we found that gender makes difference in visual perception in some stimuli: 2) also, characterized the stimuli that showed the significant and didn't in gender difference. In the experiment, the subjects evaluated the automotive front pictures on "masculinity" and "adulthood" traits with Semantic Differential method.

Keywords: Kansei, Design methodology, Gendered perception

(195) Sensory perception of surface quality
Industrial practices and prospects

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In this paper we carry out a critical analysis of the industrial practices used by the partner firms to control a product's appearance. The group of partners represents many different sectors of activity such as: luxury goods industry, furniture industry, medical equipment (prosthesis), plastic injection and watch-making industry. These practices deal with the identification of appearance anomalies, the evaluation of an anomaly's severity as well as the decisions about the product's conformity. We will show that current practices do not allow us to decrease the variability of the results frequently observed, because the subjectivity often associated with this kind of control is not eliminated using such methods. In every sector studied, we find the same dissatisfaction about the results obtained. We will then present our approach to sharply decrease this variability. This approach, tested in a famous Swiss watch-making company, is based on sensory analysis concepts. This approach is original due to the breakdown of the visual-control process into three sub-processes: the detection of appearance anomalies, the evaluation of those anomalies and the decision about conformity. This approach also includes a metrological organization and some tools which allow us to measure the efficiency reached. The paper will show how our approach succeeds in meeting the different aims of the partner company group and proposes an initial structured approach for a generic metrological organization adapted to the control of the variability during surface quality control by humans.

Keywords: Quality, Visual appearance control

(59) Entrepreneurship Start-Up Process
The Role of Emotional Intelligence

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The main purposes of this study are to investigate the preeminent predictors of entrepreneurial behavioral intention; to examine to what extend entrepreneurial behavioral intention predict entrepreneurial behavior; to find whether individual's emotional intelligence is a moderating variable of the relationship between personality and entrepreneurial intention. Most interesting findings are as follow: There are no strong relationship between personality and intention. However, the combined effect of personality and emotional intelligence has a strong effect on entrepreneurial intention. The other significant finding is that two countries' respondents significantly differ from each other in terms of clarity in self emotion management, intention to do their own business and risk-taking. It is hoped that this study will give valuable contribution to both academic and business society.

Keywords: Entrepreneurship, Personality, Intention, Emotional Intelligence

2010

(100) Study on how to overcome Business Death Valley utilizing Soft Conception Ability

Kansei enginnering has some ability to grow up company

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In the middle of the recent economic crisis that is the worst in a century, it is well known that sales and profits are lower than those of previous year in most companies. However, a few companies such as UNIQLO, McDonald's, and Nintendo are increasing its sales. How these companies can increase its profitability? I dealt with Nintendo that increases sales of its game consoles and SONY that is struggling and compared each other from the viewpoint of the product development environment based on the Kansei engineering and sought the cause. The items subject to the comparison are items that are grasped quantitatively, such as in-house cultures, ideals and goals of the company, management practices, project goals, backgrounds and in-house histories of those engaged in the business, development periods, and the number of people as well as parts that are concerned with sensitivity (qualitative items) that are extracted from interviews. Consequently, it has been proven that Nintendo as an organization put more emphasis on aesthetic aspects than on digital aspects in the development stage. Also, it turned out that people in our age require aesthetic things. It seems that these backgrounds led to the development of Wii, etc. Though I cannot conclude only from this case that the sensitivity-oriented development always brings good results, I feel transit of the age and trend simply because it was proven that the product produced by such development is accepted by the market. The detailed research is reported in the body.

Keywords: Soft, Design Business, DeathValley

(290) Study on User Involvement in Hardware, Software and Service Integrated Type Design Development

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This study is to clarify significance of hardware software service integrated type design development in business accompanied by service in the auto industry and electronics industry which are typical industries in Japan. The viewpoint of design management should be considered as the framework and method of co-creation, which is the practice of product or service development, created by both company and users together. Collective intelligence represented by Web.2.0 as methodology of building the design platform in the relation between the company and the user for hardware software service integrated type design development becomes more important in the field of design management. There are many examples which show that a company with technical predominance is defeated from the competition in the market because of low consciousness for non-technical element such as design. Generally, the technological seeds are made visible at early time when disruptive innovation is made to succeed as a business and the company that makes good use of marketing improves the market competitiveness. Nowadays, especially cases that depend on offering experience value to users with KANSEI closer to markets and users are increasing. There are little examples of market creation type business which are succeeding in ICT industries with the result of sustaining innovation. The creation of the experience value in everyday life is being shifted to user from company. The concept of legacy-free product and service development and of user involvement in the early stages of innovation process needs to be taken into account. The concept should be not the result of use of a mere enterprise asset (finance, human resource, technology, information, design and etc.) in the business model but the result of hardware, software and service integrated t

Keywords: Hardware, Software, Service, User involvement, Innovation

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