Kansei and Design:
A Systematic Mapping Review

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Abstract—**Notwithstanding the significant influence the application of Kansei has had on the field of design in recent decades, there is no record of analyses of its recent modes of implementation, limiting the transfer of knowledge for the emergence of future projects. In this regard, a Systematic Mapping Review was carried out to identify the current status of research related to Kansei and Design. Publications in Scopus and Web of Science databases from the last six years were analyzed considering the number of publications, location, and research area, among others. Findings show that while Asia continues to lead in the number of publications, diversity exists in the nationality of the authors. Fields of application, include product design, and aesthetic design along with an ongoing interest within technology areas. In general terms, it became evident that the interest in Kansei has not only remained current, but has increased and has been expanding geographically. Moreover, its application in the Design area has become so broad that it ranges from Emotional Design to Human-Robot Interaction Design. It is envisaged that the results of this study will contribute to identifying future areas of research at the convergence of kansei and design fields.**

Keywords— **Kansei and Design, Systematic Mapping Review, Research Publications.**

I. INTRODUCTION

Kansei as a research concept

Kansei research encompasses the effort to understand the cognitive and affective processes during the exposure of users to stimuli, be those products or experiences. There are numerous views in the literature regarding its nature and application, including perspectives from the fields of Arts [1], Business [2], Engineering [3], Design [4], Marketing [5], Neuroscience [6], Computer science [7], Psychology [8], and Physiology [9], among others.

In the Asian context, perhaps the most recognized term currently used to define this process is the Japanese concept: Kansei. The term was popularized in the 1970s by Mitsuo Nagamachi through the information processing technology called Kansei engineering, also known as affective engineering, which he developed from his experiences in manufacturing companies [10]. Kansei engineering is a computational —mostly statistical— process for analyzing data related to human emotions, and translating them into product attributes. Its applications include the automotive, construction machinery and food industries; home construction materials and appliances; office automation machinery and stationery products, and the garment and cosmetic sectors. [11].

From a research perspective, in addition to its application in engineering, the study of kansei has been approached with a particular focus on art and design. Notably, a study by Harada [12] characterized Kansei as an innate, subjective and intuitive mental function, which allows humans to process stimuli based on prior knowledge and experience, resulting in the cognitive expression of their interpretation through mental images. Among his diverse repertoire of contributions to the body of Kansei research, in a paper on the Incorporation of Kansei Information in Design, Harada states the following:

Inspiration and creativity are generated by looking at the same problem from different perspectives in a comprehensive manner, which requires the formation and promotion of a cross-sectional R&D organization [...], but there is now a need for this system to be introduced in research institutes and universities. In order to develop research that integrates the humanities and sciences, mere integration is not enough to advance research.
I am keenly aware that it is necessary to create a common infrastructure technology that links the

humanities and natural sciences. There is a need for the promotion of Kansei Science with a focus on understanding what this fundamental technology entails. [13]

A further study by Lee *et al.* [14] focused on broadening the understanding of kansei by considering behavioural factors linked to the cultural profiles of users in various continents, stressing the importance of generating methods for interpreting users' emotions when interacting with products, to better communicate design concepts to users. In the latter, the authors remark that in Design practice, to develop new products that correspond to the expectations of the target users, "the designer has to balance between objective and subjective properties, between functional technology and emotional expressiveness, between information and inspiration". Moreover, they point out that beyond the technical aspects, it is essential to consider subjective criteria such as aesthetic and emotional factors in order to create products that are pleasant for people. This perspective has been enriched by Bouchard and Kim [15], describing how the disciplines of design science, psychology and artificial intelligence have contributed to enhance multisensory evaluation in the so-called Kansei Information.

Convergence between Kansei and Design

During the transition from the 20th to the 21st century, design methodology has contributed to the positioning of Design as a Science, inspiring the continuous emergence of journals dedicated to design research, theory and methodology [16].

Regarding the linkage of the Kansei concept and design, after the height of Kansei engineering, research topics maintained general focus on both theoretical and practical perspectives. As an approach that has been applied to various industries, the topics of interest have covered issues such as user experience, interaction, and information design, such as in the case of the automotive sector [17,18]. An analysis of the application of the Kansei-Design binomial in Japanese industrial design was provided by Levy *et al.* [19], where it was argued that the degree of cultural dependence of the term Kansei has limited its recognition among the international research community. Nevertheless, the authors underlined the importance of Kansei-based methodology for the generation of value and the boosting of the local economy, and highlighted the Kansei-related

governmental support strategies for the future development of the industry.

II. METHODS

In order to identify published research on Kansei and Design around the world, various strategies can be generated, for example by focusing on the most important publication outlets by region, or perhaps by considering continental priority topics.

For this study, it was decided to document publications in the two most globally recognized databases: Web of Science and Scopus. However, these databases may not be as global as they appear to be. According to Tennant [20], WoS and Scoups are inclined to publish articles in European and North American journals, far above those in Asia, Latin America and Africa. Likewise, they make a big difference in the publication of articles in English as opposed to other languages, for example, in 2018, of the 23,000 journals published by Scopus, only 5,000 were in other languages [21].

Systematic mapping review is an emerging tool that uses a methodical process to identify, organize and summarize the quantity, distribution and characteristics of published studies with the objective of recognizing knowledge gaps and future research needs using statistics and graphic visualization. [22]

The methodological process of Systematic Mapping consists of a series of defined steps to analyze the collected scientific articles. To conduct this study, the methodological ideas of studies and presentations by Petersen *et al.* [23], Kitchenman *et al.* [24], García-Peñalvo [25] and Velásquez-Duran & Ramirez-Montoya [26] were taken into account. According to these approaches, a research protocol is derived, represented in Figure 1.
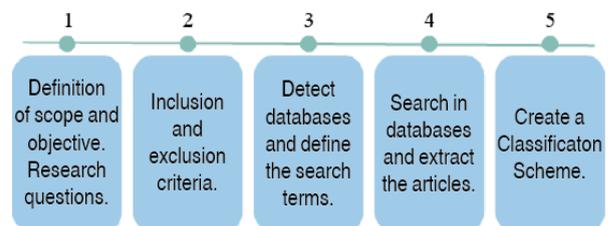

Fig. 1. *Defined protocol of the mapping methodological process (designed by the authors).*

Definition of Scope and Objective (Research Questions)

According to Kitchenman et al. [24], the first step in mapping is to define the research questions, as these set the path for the methodology. These are answered by reviewing the included studies, the questions developed are later tabulated into categories.

The scope and objective of the research will define the planning of the mapping, in order to identify opportunities for future research.

Table 1 presents the research questions for this study, as well as the frameworks for the type of responses expected.

Table 1. Research Questions

Question	Possible answers based on literature
RQ1. How many studies are in the Scopus and WoS databases from 2015 to 2021?	Number of articles in Scopus Number of articles in WOS Number of duplicated articles Number of articles per year
RQ2. What is the geographical distribution of the authors by country?	Country of affiliation of the first author
RQ3 What are the journals with more publications on this line of research?	Journals in Scopus and WoS databases
RQ4. What other keywords are used to reference Kansei Design?	Authors' keywords
RQ5. In what area of design is Kansei being applied?	Design application fields

Inclusion and Exclusion Criteria

Inclusion and exclusion criteria serve to narrow down and exclude studies that are not of relevance to answer the research questions.

The methodology proposed by Kroll *et al*. [27], stresses the importance of excluding studies that detract from the accuracy of the results.

For this study, the inclusion terms were as follows: studies on Kansei Design, articles published in journals that can be found in Web of Science (WOS) and Scopus, articles published from January 2015 to

December 2021, articles related to design as a science. On the other hand, the exclusion criteria were the following: books, book chapters and and speeches, duplicate articles, ESCI (Emerging Source Citation Index), as well as the quality criteria included indicators related to the contribution in the subject of Kansei Design and consistency with the objective and expected results. (Table 2).

Table 2. Inclusion and Exclusion Criterias

Inclusion Criteria	Exclusion Criteria	Quality Criteria
Studies on Kansei design in the WOS and Scopus databases.	Studies that do not address Kansei design.	A contribution of valuable information regarding open innovation.
Scientific articles.	Speech documents, book chapters, ESCI.	Coherence between the objective, method, and results.
Open access articles	Articles that are not open access.	--
Articles published during 2015–2021.	Articles not published during 2015–2021.	--
Articles in English language	Articles not in English language	--

Identification of the Databases and Search Terms

The databases selected to perform these queries are WoS and Scopus, in order to identify scientific texts that present evidence on the concepts of Kansei and Design. A search string was defined, following the research questions and inclusion criteria, to be applied in both databases, making a comparison of results. Boolean expressions with the same structure were used in both databases. The strings used are shown in Table 3.

Table 3. Search strings in Scopus and WOS.

Search String in Scopus	Search Strings in WoS
TITLE-ABS-KEY ((kansei) AND (design)) AND PUBYEAR > 2014 AND (	("kansei") AND ("design") AND PUBYEAR 2015-01-01

LIMIT-TO (OA , "all")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English"))	to 2022-12-30 AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (DOCUMENT TYPE, "Articules")) AND Indexes: SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH.

Extraction of the Articles through Database Searches

In this section, the collection and extraction of articles was completed, placing them in an Excel sheet. The results obtained were 90 articles from the Scopus database and 95 from WoS. Subsequently, a screening was done to eliminate repeated articles, where 45 articles were eliminated. Next, a detailed review of the abstract was performed and 14 articles, which did not correspond to the application of design as a science, were removed. Subsequently, the keywords were filtered, excluding articles that did not consider "kansei" or "design". Finally, the database consisted of 87 articles in total. (see Figure 2).
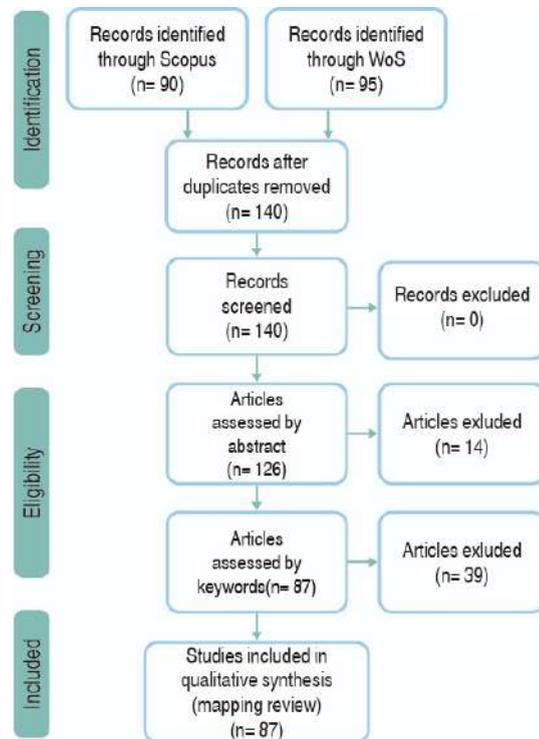

Fig. 2. PRISMA Review phases.

Creation of a Classification Scheme

According to the last step of the Protocol for Systematic Mapping, a classification scheme was proposed by the authors. The three categories are described in Table 4, which are: Framework proposal, Methodology proposal, and Product Development.

Table 4. Categories to review studies regarding Design studies (designed by the authors).

| Categories	Description
Framework or Methodology Proposals	Studies indicating the development of frameworks and methodologies aimed at improving an existing stage in the design process.
Evaluation aimed at Product Improvement	Studies that mention the development of proposals for the improvement of products, experiences, or spaces with a user-centered approach.
Evaluation aimed at Perception Measurement	Studies that focus on the evaluation of human perception of various factors related to design, such as shape, color, patterns, among others
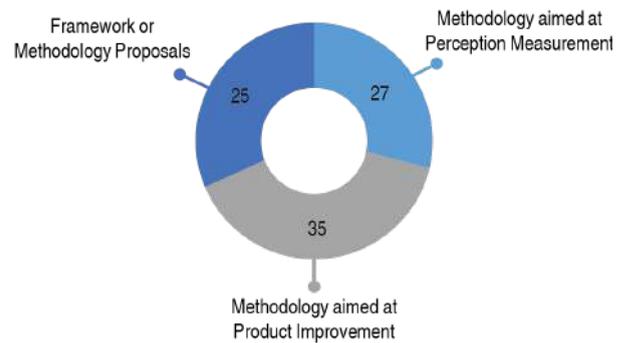
Fig. 3. Distribution of articles based on the three categories proposed by the authors.

III. RESULTS

As part of the methodological process, a database was created where the articles considered necessary to answer the research questions, as well as to illustrate the results obtained, were included: https://doi.org/10.5281/zenodo.5627919

RQ1. How many studies are in the WOS and Scopus databases from 2015 to 2021?

A total of 87 articles were obtained. The analysis of these shows the growing interest in kansei from the design research area. There has been a constant growth in the number of articles published per year, where the publications made in 2020, double those of 2015. Subsequently, the abstracts of all the articles were analyzed to determine the type of methodology applied.
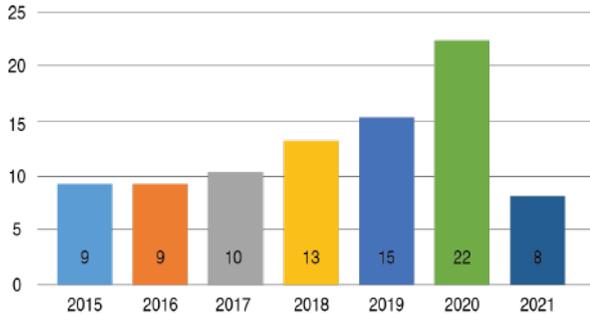
Fig. 4. Number of articles published by year.

RQ2. What is the geographical distribution of the authors? Countries where the authors are from?

According to the geographical distribution of the authors, based on the affiliation of the first author of each publication, Kansei Design articles were more frequent in Asia, specifically in China with 26 articles. After that, Japan stands out with 16, followed by Indonesia and Malaysia, both with 10 articles.

On the other hand, the expansion of interest in the Kansei concept has expanded, with presence in four of the five continents.
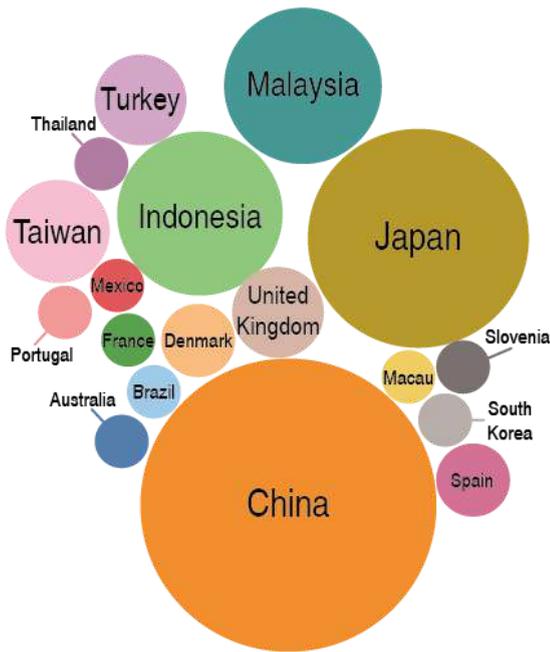

Fig. 5. Geographical distribution of authors

RQ3. What are the journals with more publications on this line of research?

The six most published journals, starting with the largest, are "Computer-Aided Design and Applications", "Journal of Advanced Mechanical Design, Systems and Manufacturing", "Applied Sciences", "Mathematical Problems in Engineering", "Procedia Manufacturing", and "Computational Intelligence and Neuroscience".
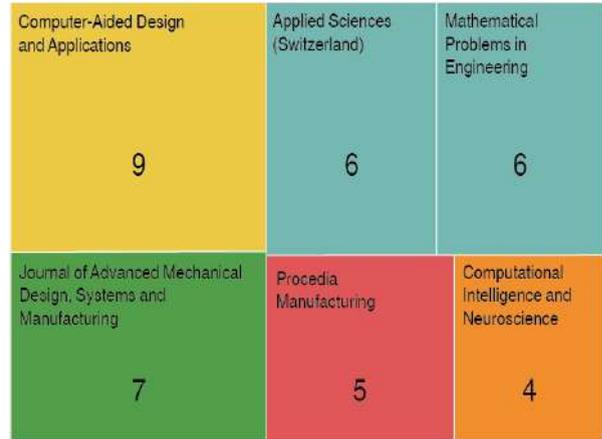

Fig. 6. Journals with more publications

RQ4. What other keywords are used to reference Kansei Design?

The most used term, referring to the meaning of Kansei, is Kansei engineering, followed by Emotional Design and then Perception

Fig. 7. Most frequently used keywords.

RQ6. In what area of design is Kansei being applied?

The areas of application were very varied, in which Product Design stands out, followed by Aesthetic Design, and in third place, User interface Design.
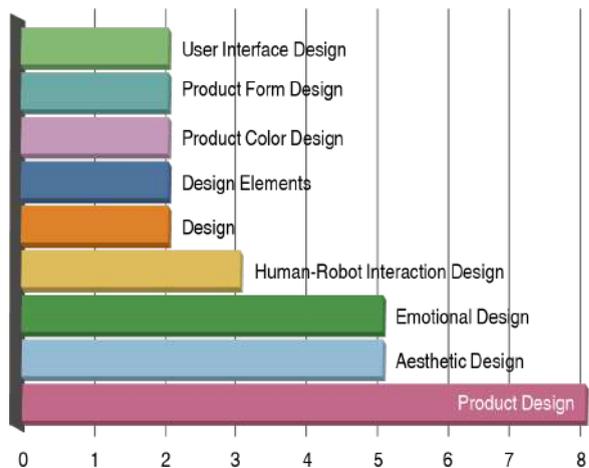

Fig. 8. Areas of design where Kansei is applied.

Discussion regarding the Mapping results

In terms of the geographical concentration of articles that include the words Kansei and Design, Asia is still in the lead, however, there are publications in practically every continent except Africa. As the results are presented in RQ2, and visually in Figure 4, most of the articles published in high impact journals in the Scopus and WoS databases belong to China, followed by Japan. These results seem to contradict the arguments presented by Tennant [20] about the limited coverage of Scopus and WoS publications in Asia, Latin America and Africa compared to the high concentration in Europe and North America. From another perspective, the arguments about the uneven coverage of journals in Scopus and WoS, which favors Europe and North America, suggest that there are indeed many more publications in Asia, Latin America and Africa than could be identified in this study.

There is a marked appearance of the Kansei-Design binomial in journals of the areas of hard sciences. This can be noticed in Figure 5 for RQ3, which shows the six journals with the most publications, whose titles correspond to the topics of computer science, manufacturing and engineering.. This pattern is consistent with the origin of the concept of manufacturing Kansei engineering pointed out by Nagamachi and Lokman [10], as well as the computational nature of this technology [11]. It can be interpreted that since the term kansei originally permeated in sectors related to manufacturing and computational analysis, as a result of the insertion of the Kansei engineering technology, the concept has maintained its position to date, among researchers who practice data analysis processes for the improvement of products in these areas in particular.

Along with the binomial of kansei and design, the most used terms cover the hard science aspect as well as the more psychological aspect of research. Beyond corroborating the positioning of the term Kansei engineering, the word cloud represented in Figure 6 of RQ4, highlights other concepts that allow us to envision the influence of the Kansei and Design combination in other fields of application. In this respect, finding a balance between the technological and the emotional, as pointed out by Lee *et al.* [14], is a requirement that ultimately contributes to the design of products better aligned to the demands of potential users. In light of this perspective, it is inferred that in the search for information regarding Kansei and

Design research, the results will be more robust if both objective and functional aspects as well as affective aspects are integrated as keywords.

It is remarkable how the most influential topics of the Kansei-Design binomial have maintained the lines of technological development on the one hand, and artistic perception on the other. Since the emergence of kansei, Product Design has been a mainstay for its application, along with perception in terms of Aesthetics, as shown in Figure 8. At the heart of research combining kansei and design is the aim to successfully process and transfer the user's affective information into the development of pleasure-producing products. [3,14,13,19,15]. This vision from research conducted on kansei and design recovers the importance of achieving harmony between the tangible and the abstract when developing research projects in this field.

IV. CONCLUSION

As the dissemination of kansei and design concepts has expanded in the research arena, it is important to identify the direction their influence has taken in publications around the world. By examining the concentrations of publications geographically and thematically, and their fields of application, this systematic mapping made it possible to illustrate the currency of terms in international use, as well as the most frequent approaches in terms of disciplines and topics.

Upon verifying that postings in Asia remain above the international average, it was established that the positioning of the kansei - design binomial remains positive among researchers in countries such as China and Japan. However, the extent of this result may be biased by the low impact of the Scopus and WoS databases in this continent, implying that there are in fact more publications, including countries such as Korea, and across other continents. This suggests that, although compelling data is presented, it is also important to take into account the publication requirements governing the countries that research in Kansei and Design, as there may be journals and dissemination venues with relevant findings that might otherwise remain as gray literature.

Future research on kansei and research design should focus on establishing a broader sample of databases, as well as undertaking a more in-depth review of methodologies complementary to kansei engineering technology. In addition, although this mapping covered the concentration of publications in a relatively recent

period, studies that conduct more comprehensive analyses over a wider range of years are called for, which would reveal the evolution of the relationships between keywords with a view to proposing frameworks for future research.

ACKNOWLEDGEMENT

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Session 4

Emotional Design / Contents

Chairs: S. Prabhu (SRMIST, India) & V. Magesh (SRMIST, India)

D-O-1	A.Sánchez-Salgado, S.H.Lee, J.Sanabria-Z	Tecnologico de Monterrey, University of Tsukuba, Institute for the Future of Education, School of Architecture, Art, and Design (EAAD)	Mexico	Kansei and Design: A Systematic Mapping Review	136
D-O-2	Changhee Seo, Songhee Park, Hojin Sa, Jieun Kwon	Sangmyung University	KR	A Study on UI Design of Video Authoring Tool Application for Seniors	143
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Program (ICES2021)

Time (INDIA)	Time (KOR)	Contents					Note
04:30	08:00-	Registration					
06:30-08:30	10:00-12:00	**Keynote Speech I**: Hemispheric Lateralization and Emotion Regulation in Depression *Prof. Azizuddin Khan, Ph.D* *(Indian Institute of Technology, Bombay, INDIA)* **Keynote Speech II**: Virtual Human Synthesis using AI Techniques *Prof. InKyu Park, Ph.D* *(Director of Artificial Intelligence Convergence Research Center, Inha University, KOREA)*		**Keynote Speech III** : Science&Engineering for Individuality : Cognitive Diversity *Prof. Toshikazu Kato, Ph.D.* *(Chuo University, Tokyo; Vice President of Chuo University; Former Vice President of Japan Society of Kansei Engineering, JAPAN)* **Keynote Speech IV** : A Room Alive: Designing Socially Interactive, Robotic Environments *Prof. Yixiao Wang, Ph.D (Singapore University of Technology & Design, SINGAPORE)*			Watching videos
08:30-09:10	12:00-12:40	**Discussion with Experts** *Chairs: SeungNam Min (Organizing chairman of KOSES) & S. Murali (SRMIST, India)* *Discussion: ShinWoo Kim (KwangWoon Univ., Korea), S. Prabhu (SRMIST, India), Varshini Karthik (SRMIST, India), A. K. Jayanthy (SRMIST, India) & Jaehyun Park (Incheon National Univ., Korea)*					Q&A zoom
09:10-09:30	12:40-13:00	Break Time					
09:30-09:40	13:00-13:10	**Opening address**: *T. V. Gopal (Dean of CET, SRMIST, India)* **Welcome address**: *YoungJoo Na (President of KOSES, Inha University, Korea)*					Watching videos
09:40-11:30	13:10-15:00	**Oral Session 1**: AI-Emotion Convergence & Internet of Everything Chairs: *D. Ashok Kumar (SRMIST, India) & M. Prakash (SRMIST, India)*	**Oral Session 2**: Emotion Measurement/Psychology/Physiology *Chairs:* *Taebeum Ryu (Hanbat National Univ, Korea) & M. Uma (SRMIST, India)*	**Oral Session 3**: Emotional Clothing / Environment *Chairs:* *Eunjou Yi (Jeju National Univ., Korea)* *& Arul Jeya Kumar (SRMIST, India)*	**Oral Session 4**: Emotional Design / Contents *Chairs:* *S. Prabhu (SRMIST, India) & V. Magesh (SRMIST, India)*	**Oral Session 5**: Ergonomics & Bioinstrumentation, Wearables, Etc. *Chairs:* *Sung-Phil Kim (UNIST, Korea) & S. Murali (SRMIST, India)*	videos * Q&A: zoom KOR 14:30-15:00, INDIA 11:00-11:30
11:30-12:30	15:00-16:00	**Poster session 1**: *Chair: Shinjung Yoo (Kyung Hee Univ, Korea)*			**Poster session 2**: *Chair: Youngjoo Chae (Chungbuk National Univ, Korea)*		* Q&A: zoom KOR 15:30-16:00, INDIA 12:00-12:30
12:30-14:00	16:00-17:30	**Special Lecture 1**: Research on 'Image Icon' to 'My Daily Badge': a Story of Gamsung Design and Interaction *Prof. SeungHee Lee (Univ. of Tsukuba, JAPAN)* **Special Lecture 2**: AI Design, Coexistence of Technology and Design *Prof. DaYoung Ju (Kookmin Univ., KOREA)*		**Special Lecture 3**: AI and its Impact on the Fashion Industry *Prof. Hye Won Lim (Univ. of Leeds, ENGLAND)* **Special Lecture 4**: Affective Computing (Emotion AI) based on Biomedical Signals *Dr. Wuon Shik Kim (Director of KIOM, KOREA)*		**Special Lecture 5**: Optimality and Sensibility - Introduction to Optimal Transport *Prof. YoungHeon Kim (Univ. of British Columbia, CANADA)* **Special Lecture 6**: Validation of Affect Detection Algorithms using Wearable Device *Prof. JungYoon Kim (Kent State University, USA)*	Watching videos
14:00-14:30	17:30-18:00	**Discussion with Experts** **(Special Lecture 1~3)** *Chairs: S. Prabhu (SRMIST, India)* *Yu-Jin Kim (KongJu National Univ., Korea) &* *SeungHee Lee (Univ. of Tsukuba, Japan)*			**Discussion with Experts** **(Special Lecture 4~6)** *Chairs: SeungNam Min (Shinsung Univ. KOSES)* *Wuon-Shik Kim (KIOM, Korea)* *& M. Uma (SRMIST, India)*		Q&A zoom
14:30-15:00	18:00-18:30	**Award**: *YoungJoo Na (President of KOSES) & Moderator: Jisu Kim (Inha Univ., Korea)* **Future Conference Announcement**: *JaeHee Park (Vice President of KOSES, Korea)*					zoom

Oral Session - ICES2021 (26th Nov.)

Research Area	Number	Name	Institution		Title
Session 1: AI-Emotion Convergence & Internet of Everything *Chairs:* *D. Ashok Kumar (SRMIST, India) &* *M. Prakash (SRMIST, India)*	A-O-1	Chung Heon Lee, Jun-Dong Cho	Sungkyunkwan University	KR	Appreciation of Visual Arts with Poetry Using Artificial Intelligence
	A-O-2	G. Keerthi, M. S. Abirami	SRM Institute of Science and Technology	IN	Analysis and Comparative study on Maternal Mortality for Diabetes prediction using different Machine Learning Algorithms
	A-O-3	V. Gowri, S. Prabhu	SRM Institute of Science and Technology	IN	Virtual health monitoring – A robot based approach
	A-O-4	D. Senthil Vadivelan	SRM Institute of Science and Technology	IN	Analysis of BCI System to Operate Robotic Arm Control for Navigation to Assist Disable People
Session 2: Emotion Measurement/Psychology/ Physiology *Chairs:* *Taebeum Ryu (Hanbat National Univ, Korea)* *& M. Uma (SRMIST, India)*	M-O-1	Inik Kim, Junhyuk Jang, Jongwan Kim	Jeonbuk National University	KR	Measuring consistency between individuals of affective responses to ASMR stimuli using intersubject correlation
	M-O-2	Taebeum Ryu	Hanbat National University	KR	Effect of object shape on perceived weight
	M-O-3	Eiji Onchi, Max Hanssen, Kaihuan Wei, Pengcheng Wan, Cen Zhang	University of Tsukuba, Nagaoka University of Technology	JP	Design and Development of 'My Daily Badge': a Wearable Device for Habitual Behavioral Tracking
	M-O-4	Max Hanssen, Eiji Onchi, Muneo Kitajima, SeungHee Lee	University of Tsukuba, Nagaoka University of Technology	JP	Subjective Differences of Walking Behaviors Between Familiar and Unfamiliar Routes
	M-O-5	S. Ramya, M. Uma	SRM Institute of Science and Technology	IN	A Study of Epilepsy Prediction using Machine Learning methods
	M-O-6	Dhruba Jyoti Sut, S. Prabhu	SRM Institute of Science and Technology	IN	Design and Development of a Soft Gripper (A Review)
	M-O-7	Manoj Kushwaha, M. S. Abirami	SRM Institute of Science and Technology	IN	Analysis and Identifying of Important Features on Road Accidents by using Machine Learning Algorithms
	M-O-8	K. Poomari Durga, M. S. Abirami	SRM Institute of Science and Technology	IN	Analysis of Various Machine Learning Algorithms for the Prediction of Heart Disease
	M-O-9	M. Yohapriyaa, M. Uma	SRM Institute of Science and Technology	IN	Development of new tool using formal psychological assessment for depression diagnosis
	M-O-10	Wuon-Shik Kim	Whowant Corp.	IN	The influence of tic suppression on Mu waves in EEG for Tic disorders (Tourette Syndrome): Case Report
Session 3: Emotional Clothing / Environment *Chairs:* *Eunjou Yi (Jeju National Univ., Korea)* *& Arul Jeya Kumar (SRMIST, India)*	C-O-1	Ayano Dempoya, Kouhei Kuwabara, Yasuhiro Hamada, Keita Yamazaki	Kanagawa University, Muroran Institute of Technology, Hokkaido University, Takenaka Corporation	JP	A Study on Thermal Comfort when Wearing Air Ventilation Clothing at Construction Sites
	C-O-2	Jin Young Kim	Kookmin University	KR	Big Data Analysis of Noise Problems through Floors based on Social Media Channels
	C-O-3	Hye-Won Lim, Raheleh Jafari	University of Leeds	UK	Exploration in 3D Body Scanning Mobile Applications
	C-O-4	Dong Hwa Yoon, Youngae Yang, Jinhyun Ahn, Eunjou Yi	Jeju National University	KR	Effect of Color Area Ratios, Combination Types, and Physical Colorimetric Variables of Two-Color Combination with Naturally Dyed Fabrics on Color Emotion Factors and Preference

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