

ISASE2019



The **5th** International Symposium on Affective Science and Engineering

March 17 (Sun.) - 18 (Mon.), 2019
Kogakuin University, Tokyo, Japan

DAY 1: March 17, 2019 Sunday	
09:00-09:50	Registration
09:50-10:00	Opening Remarks
10:00-10:40	Keynote Talk 1: Hideyoshi Yanagisawa
10:50-11:30	Keynote Talk 2: Emi Yuda
11:30-13:00	Break
13:00-14:40	Oral Presentation Sessions 1: 1-A, 1-B, 1-C
15:00-16:40	Oral Presentation Sessions 2: 2-A, 2-B
16:40-17:00	Poster Session P
17:30-20:00	Banquet

DAY 2: March 18, 2019 Monday	
09:00-09:30	Registration
09:30-11:10	Oral Presentation Sessions 3: 3-A, 3-B
11:30-13:10	Oral Presentation Session 4: 4-A, 4-B
After Session	A social tour of the big city Shinjuku, Tokyo

Welcome to ISASE 2019

A New Stage on Affective Science and Engineering



Hisao Shiizuka
(Chair of ISASE)

It is my great pleasure to welcome you to attend ISASE 2019, the 5th International Symposium on Affective Science and Engineering to be held in Kogakuin University, Shinjuku, Tokyo, Japan.

The main objective of this symposium is to bring together academics, engineers, manufacturers, and government officials to present and exchange knowledge, experience, results, and information related to the broad aspects of methodologies employed in affective science and engineering, and also artificial intelligence, cognitive science, etc. Since the affective science engineering is related to many other fields surrounding, it provides a new field and propelling technology that can enable us to bridge gaps between humans and systems. The scope of this symposium covers all fields of advanced technology and science, manufacturing, production as well as design that are related to affective and intelligent fields.

The world is now moving toward the goal of the SDGs (Sustainable Development Goals) led by the United Nations. The SDGs is the goal of “To make the world better by 2030” decided by the United Nations in 2015. The important thing here is that it is “sustainable”. Various problems are piling up in the world. The SDGs has five categories and 17 goals. The five categories are shown below.

- People
- Prosperity
- Planet
- Peace
- Partnership

The basic idea of SDGs is “No one will be left behind”. We are focusing on the weakest people aiming at achieving the goal for everyone.

I think that Affective Science and Engineering is offering a new challenge to the achievement of this SDGs goal. ISASE’s contribution to such a meaning will be at the new stage.

I hope that this conference will be a forum for valuable information exchange for everyone.

Sunday, 17th March

ISASE 2019 Special Events (Room A0765)

9:50 – 10:00

Opening Remarks (Room A0765)

10:00 – 10:40

Key Note Talk 1 (Room A0765)

How does expectation affect sensory experience?-A Theory of Relativity in Perception-
Hideyoshi Yanagisawa (The University of Tokyo)

Abstract: Prior expectation affects posterior experience and emotions. This psychological effect is called *expectation effect*. Two different patterns of expectation effect, contrast and assimilation, were observed. In this talk, I proposed a mathematical model of the expectation effect that explains the conditions of contrast and assimilation. I hypothesized that perceived variable is estimated using a Bayes' inference of prior prediction and likelihood based on sensory stimuli. I formalized the expectation effect as a function of three factors: expectation error, prediction uncertainty, and external noise. Both the results of the computer simulation using the model and the experiment using Size-weight illusion (SWI) revealed that 1) the pattern of expectation effect shifted from assimilation to contrast as the prediction error increased, 2) uncertainty decreased the extent of the expectation effect, 3) and external noise increased the assimilation. Furthermore, I discussed the meanings of expectation effect from an ecological point of view.

10:50 – 11:30

Key Note Talk 2 (Room A0765)

Application of Bio-signal Informatics: Latest Research of Biomedical Big Data Analysis
Emi Yuda (Nagoya City University)

Abstract: The reasons why people began to recognize the importance of big data; evolution of computer technology, technological innovation by IoT and AI (artificial intelligence) development, etc. Especially in machine learning, it is necessary to use a large amount of data for learning. Many kinds of big data analyses are currently conducted focusing not only on customer analysis for solutions using BI (business intelligence) tools but also on the analyses of medical information and biological data. After May 2018, when the act of next-generation medical infrastructure (the anonymous processing of medical information for contributing to research and development in the medical field) carried out, the medical information possessed by medical institution became able to be used after anonymization. This mechanism is to be provided for universities, pharmaceutical companies, etc. However, potentially much "bigger data" can be constructed for individual vital information collected by healthy subjects. How to use and to utilize them for researches are important issues of current bio-signal informatics. Our researches conducted to establish new methods for evaluating the influence of environmental factors on health and disorders may provide insights for extracting meaningful results from such data. In this talk, I will outline our recent researches on bio-signal big data analyses and mention new possibilities.

13:00 – 14:40

ISASE2019 Oral Presentation Sessions 1 (Room A0765, A0715 and A0762)

1-A: Interaction Design (Room A0765) 13:00 – 14:40

1-A-1: The Babysitting Co-op Revisited-How to Nudge People to Investing in Babies-

*Hiromi FUJIMORI (Economic and Social Research Institute), Takuo YONEDA (Dot Ltd.)

Abstract: We will have a look into an existing babysitting cooperative and discuss the effectiveness of nudge theory of behavioral economics in the community. There, parents are exchanging coupons as a currency and babysitting their own children with each other. However, at some point, the cooperative faced with severe supply-demand imbalance of coupons and went into "depression". We will offer a solution to adjust the imbalance by using an application with applying six major techniques of nudge theory to the design.

1-A-2: Structural and Philosophical Features of an Effective Communication Space for Cultivating Sensibility on Rivers and River Management-A Case Study of *Iikawa and Iikawa-dukuri Workshop*-

*Tomomi Maekawa (Mie University)

Abstract: In the area of community-based natural resource management, the increasing difficulty of maintaining community groups and for them to keep carrying out their activities is a serious challenge. In order to search for a way to solve this situation, this study aims at describing the key structural and philosophical points of an effective communication space that cultivates a supportive network among the community groups, and amongst the individual members of the groups. The name of the focused communication platform is the *Iikawa and Iikawa-dukuri Workshop*. This is a long lasting annual award selection workshop event where the participants are encouraged through gaining confidence and feeling rewarded for their work caring for their local rivers. Through document analysis and in-field research, this study shows that there is a well-designed spatial forum with an open and creative structure, and a future-oriented philosophy that maintains moral safety in the communication during the workshop.

1-A-3: Effect of Latency and Space Discrepancy on Sense of Agency

*Qiuyu YANG, Hideyoshi YANAGISAWA (The University of Tokyo)

Abstract: The sense of agency (SoA) is an important Kansei quality in interactive design. It refers to the feeling that one is in control of his/her actions and, through them, of events in the outside world. Our living world consists of two dimensions: space and time. One perceives and operates objects in time and space. Thus, time and space are essential factors in interaction design. The objective of this study is to find how congruency of space discrepancy and latency affect the SoA while interacting an object through an interface and whether they have interaction effect. We conducted an experiment with participants to compare between varied space discrepancy and latency with respect to SoA. We used intentional binding and questionnaire to measure both implicit and explicit SoA, respectively. The result showed that both latency and congruency of space discrepancy affect the explicit part of sense of agency, while only latency affects the implicit part of sense of agency. Interaction effect was observed between latency and congruency of space discrepancy only in the explicit part of SoA. The result provided an explanation to how these two factors affect SoA. Furthermore, we proposed a standardization method for the result of intentional binding supporting that latency has similar effect on the explicit and the implicit part of SoA. That is, as latency increases, the SoA decreases.

1-A-4: An Intention Transmission Interface by EOG with Close Eyes

*Daisuke TAMAKI (Kogakuin University), Hiromi FUJIMORI (Economic and Social Research Institute), Hisaya TANAKA (Kogakuin University)

Abstract: We have studied the Electrooculography (EOG) interface for Amyotrophic lateral sclerosis (ALS) patients that can use without preparation. We proposed eye move detection method using Root Mean Square (AT method) and k-nearest neighbor (k-NN) method. AT method is the threshold method that

dynamically calculate by RMS. This report relates to the combined use of AT method and k-NN method. We conducted experiments about detection accuracy for 19 healthy subjects in their twenties. As the result, proposed method's hit rate was 94%, and the FA rate was 9%. Next, we calculated Information transfer rate (ITR). ITR is popular evaluation index in Brain computer interface. The minimum ITR of proposed method was 19.02[bits/min]. The P300 speller is one of the BCIs. The ITR of P300 speller is 16.4[bits/min]. About ITR, Proposed method is higher than P300 speller. Therefore, it can be said that the proposed method has usefulness as an interface.

1-A-5: Intrinsic Motivation in Virtual Assistant Interaction

*Chang Li, Hideyoshi Yanagisawa (The University of Tokyo)

Abstract: Conversational virtual assistants have exploded in popularity in recent years. Developers have been working to create personality in virtual assistants, so that users treat them more than mere automation tools. Among other factors, motivation is considered playing an important role. However, previous researches focused mainly on extrinsic motivation, and ignored the fact that intrinsically motivated engagement cultivates better relationship of reliance. Intrinsic motivation is derived from inner urge to seek enjoyment in an action itself, while extrinsic motivation is oriented at consequences and rewards. In context of virtual assistant interaction, motivation is formed based on the user's prior expectation: whether the assistant can cope with his/her intention. When the expectation is contradicted, the user is subjected with disruption and is bounced back to learning process about the assistant's attributes. Related works in expectation effect found that the surprising amplitude of disruption is function of perception uncertainty and prediction error. The current research investigated effects of expectation towards the assistant's capability and uncertainty during perception on intrinsic motivation. We conducted laboratory environment experiments using Amazon Echo smart speakers and extracted subjective assessment as well as used free choice paradigm as objective measurement. The result showed a significant trend that small uncertainty encouraged more intrinsically motivated interaction while large uncertainty motivated the participant to interact in order to resolve uncertainty. Neither uncertainty nor expectation showed main effect on subjective assessment on intrinsic motivation. Our findings suggest that trading consistency for performance is a risky strategy in designing virtual personality.

1-B: Fashion and Brand Marketing (Room A0715) 13:00 – 14:40

1-B-1: Derivation of Evaluation Items of Inner Branding for Quantitative Method-Proposal of Quantitative Evaluation Method of Inner Branding Using CS Analysis-

*Takahiro Nishihara, Masahiro Kiyosumi (Kyushu University), Hisao Shiizuka (SKEL Shiizuka Kansei Engineering Laboratory)

Abstract: In general, it is well known that the image of a brand will be better or worse with one employee's actions. Therefore, it is the inner branding that the employee also performs to sufficiently understand the brand. In order to succeed in branding, inner branding is becoming indispensable as with branding for customers. Generally, regardless of inner or outer branding, no research on quantitative evaluation of branding is found. Under such circumstances, this paper aims at quantitative evaluation of inner branding and attempts to derive its evaluation items. Then we propose quantitative evaluation method of inner branding using them.

1-B-2: An Empirical Analysis of Pricing in Luxury Fashion Brands

*Takao Furukawa (Kyoritsu Women's University), Mariko Nakazawa (e-Agency), Chikako Miura (Kyoritsu Women's University), Kaoru Mori(Keio University)

Abstract: Characteristics of luxury fashion brands were unveiled from regular and selling prices extracted from retail online stores specialized for luxury fashion. This paper introduced an assumption that a brand determines regular prices definitively, however, retail online stores dynamically adjust selling prices considering the balance between consumer demand and producer supply. Regular price distributions showed the prestige of 34 luxury fashion brands, where traditional French and Italian brands appeared in a higher rank. However, two emerging luxury brands also appeared in a higher rank. This result suggests mobility of creative talents enabled to inherit brand equity of traditional and prestigious brand beyond the border of brands. The result of ANOVA suggests that 34 luxury fashion brands were segregated in the market, even price distributions overlap each other. Two-way ANOVA for brand groups comprised and main and diffusion lines confirmed the difference between lines and the difference between regular and selling prices. This paper classified these brand groups into five types based on brand operations in addition to the price relationship between main and diffusion lines.

1-B-3: A Classification Method for Silhouettes of Various Clothes

*Tetsuo Tsuru (Ueda College of Fashion), Masahiro Sugahara (Proto Vision), Haruhiko Nishimura (University of Hyogo)

Abstract: In this paper, we propose an effective classification method for the silhouettes of various kinds of clothes. There are two approaches to analyzing clothes. The first method focuses on the basic elements of a garment's design, from the viewpoint of its creator. The second method features detailed categories with respect to the garment made. The silhouette of a garment is one of the most important pieces of information in fashion design trends. Here, we focused on classifying silhouettes that lead to the creation of trends, rather than classifying items made of clothing. This classification makes it possible to create a data set of silhouettes that can be used to multi-class classifications in a deep neural network.

1-B-4: Patternmaking of individualized A-line dress using computerized 3D draping method

*KyoungOk Kim, Koichi Hirabayashi, Masayuki Takatera (Shinshu University)

Abstract: This study aims to make an individualized A-line dress from three dimensional (3D) body data. Shapes of a body and an A-line dress which was fit on the body were obtained by 3D scanning. From the scanned 3D data, cross-sectional dimensions of regular intervals were obtained. Then, ratios of the maximum distance of front, back and width on transverse planes from the origin between the body and the dress were obtained as multiplication factors. A target body was deformed using the multiplication factors to construct a new dress model. Employing the proposed method, a 3D dress model was made. Using the computerized 3D draping method, the pattern was obtained and the dress was made. It was fitted on the target body while preserving the original shape dress. This method will help to make an individualized dress using 3D scan body data

1-B-5: Influence of Interaction with Product Information on Selection Results-On making decisions when purchasing gifts-

*Yuri Hamada, Kenta Fukuda, Hiroko Shoji (Chuo University)

Abstract: The authors have investigated the influence of interaction with product information on selection results in product purchase. In the previous study, the authors investigated cases the participants selected watches themselves to wear, however in this study we conduct similar investigation on decision making when purchasing gifts. As a result of comparing with the previous study, even when purchasing gifts, it was found that the selection result varies depending on the interaction of product information. Next, we investigated on gender differences. As a result, we found that the selection result was more likely to change for females than males by interaction with product information. Finally, we compared the price variance of selected products with the previous study. As a result, males showed that prices are set to a certain extent when purchasing their own, whereas there are variations in the budget for gifts. On the other hand, females do not change the budget for gifts, however in the case of their own, the price range tends to vary.

1-C: Affective Measurement (Room A0762) 13:00 – 14:40

1-C-1: Effects of Listening Attitudes on Affective Evaluation of Switch Sounds

*Kenji Ozawa, Kousuke Yamaji (University of Yamanshi), Takeshi Shirasaka, Katsuya Saito, Hisato Shimomura (Alps Alpine Co., Ltd.)

Abstract: Switch sounds are not always pleasant for passive listeners although they are comfortable for operators to confirm the completion of their operations. An example is how the sounds of keyboard typing of other passengers are deemed noisy in a railway train. This difference in affective evaluation may be due to the attitudes of listeners: the operator is in an active listening attitude with tactile feedback from the pushed switch whereas a usual listener is in passive listening attitude. To separate the effects of tactile information and listening attitudes, we defined an active listener as one in an active listening attitude but without tactile feedback. To examine these effects on affective evaluation of switch sounds, a psychoacoustical experiment was carried out using 15 switches. The sound quality of each switch sound was evaluated by the semantic differential (SD) method using 26 adjective pairs. Eighty-one subjects participated in the experiment as one of the roles of operator, active listener, and passive listener. The results were analyzed using factor analysis; the three factors of activity (brightness), evaluation (aesthetic state), and potency (volume) were extracted. The comparisons of these factor scores among the three roles revealed the following two points. First, the effects of tactile information seem different depending on the switches used. Second, a passive listening attitude results in the negative evaluation of sound: less active, more uncomfortable, and noisier. This finding supports the abovementioned scenario in a train.

1-C-2: Screening of Track Driver's Sleep Apnea by Subjective and Objective Measure

*Emi Yuda, Yutaka Yoshida, Junichiro Hayano (Nagoya City University)

Abstract: Usefulness of subjective sleep quality assessment by a questionnaire (OSA-MA sleep inventory) was examined in ten track drivers (age, 23-62 yr) in reference to the objective measure by cyclic variation of heart rate (CVHR) in electrocardiogram (ECG) during sleep. Total CVHR suggesting moderate-to-severe sleep apnea (average >15 cycles/h) was observed only in one subject and frequent CVHR in a limited time was detected in the same subject and two other subjects. Subjective sleep quality assessed less sleepiness on rising, good initiation and maintenance of sleep, less frequency of dreaming, refreshing feeling, and subjective sleep length as factors 1-5, respectively. The subject with high total CVHR showed factor scores <-1 SD for factors 1, 2, and 3 and reported subjective sleepiness during driving. In the two subjects with frequent CVHR in limited time, one showed factor score <-1 SD for factors 3 and 5, while the other subject did not show score <-1 SD for any of the factors. Although this is preliminary study in a small sample size, it suggests the possible associations between the subjective assessment of sleep quality and the objective measure of CVHR.

1-C-3: The Effect of Time Passage on Kansei Evaluation-Wearing comfort of on-ear headsets as an example-

Jun-Ming Lu, *Yu-Hsuan Tsai, Yu-Ling Liang (National Tsing Hua University)

Abstract: This study aims to investigate the effect of time passage on kansei evaluation, i.e. whether the results may change as the user interact with the product for a longer time compared against his/her first impression. Eight on-ear headsets covering three levels of ear pad material, two levels of headset weight, and two levels of clamping force were considered. Each of the 30 participants was asked to evaluate each of the eight headsets with 18 bipolar kansei keywords related to wearing comfort right after it was put on from behind by the test giver, so as to exclude the influence of visual stimuli. After experiencing the headset for 15 minutes without auditory input, the same evaluation was performed as the headset remained on the participant's ears. Results indicate that the representative semantic concepts of wearing comfort changed over time, so did the corresponding design parameters. More specifically, users tend to underestimate the value of more breathable ear pad materials and the higher stability contributed by the stronger clamping force, unless they can experience on-ear headsets for a considerable time.

1-C-4: A User Evaluation System Using Sensors of Smartphones

*Ryo Yamaguchi, Jue Zhang, Naiwara P. Chandrasiri (Kogakuin University)

Abstract: Currently, user evaluation systems in online shopping sites and content download sites are mainly adopting a 5 grade evaluation scheme. It was devised to facilitate statistical use by discretizing the continuous quantity of evaluation to 5 points. However, there are opinions that expressing the evaluation with only 5 points is baffling judgements. Therefore our idea is that if we realize an evaluation scheme which can express the kansei evaluation of individuals easily and intuitively with continuous quantities by using sensors of smartphone, we can partially overcome this problem. In this research, our main purpose is to develop a better evaluation system that reflects kansei characteristics of a user. In order to realize that we examine the relationship between user evaluation results and the vibration data that are collected using built in sensors of a smartphone such as acceleration sensor and gyro sensor, and also investigate the error characteristics in the evaluation. In the prototype application we developed, when a user shakes the terminal, the strength of the vibration is measured with built in acceleration sensors of the smartphone. We conducted an experiment to compare the user evaluation results by our application and the conventional 5 grade evaluation scheme. As a result, it was found that the evaluation by the proposed application is effective because the evaluation by the application and the evaluation by the 5 grade scheme have a positive correlation. Also it was found that compared to 5 grade evaluation scheme, the evaluation by our application is easy to express and has a higher sensitivity which reflects kansei characteristics of a user as the variances of the evaluation by the application to the questions which were evaluated as 2, 3 and 4 (mid values) were larger than that of 1 and 5 (extreme values) in the 5 grade evaluation scheme.

15:00 – 16:40

ISASE2019 Oral Presentation Sessions 2 (Room A0765, A0715 and A0762)

2-A: Affective Science and Education (Room A0765)

2-A-1: Assessment of the Hoisting Motion via Motion Analysis and Physical Perceptions—Aiming to Reduce the Burden on the Lower Back during the Transferring Motion—

Keiko Fukuroku, *Yuma Eto (Mie University)

Abstract: The present study evaluated the burden on the lower back during the transferring motion that is commonly performed in nursing, and evaluated the association of this burden with the knee flexion angle. The aim of the present study was to verify the knee flexion angle at which the vertically upward force was maximized while the subject was performing the hoisting motion to move an object (simulating a patient). The mean maximal forces applied vertically upward to the object were significantly greater when the subject had knee flexion angles of 60° and 80° compared with a knee flexion angle of 40°. However, the mean maximal force applied vertically upward to the object with a knee flexion angle of 80° did not significantly differ from that with a knee flexion angle of 60°. This suggests that a flexion angle of the knee joint of 60° minimizes the burden on the lower back, assuming that the effect of the upper body is excluded.

2-A-2: Student participants' free comments after a short-term session of augmentative and alternative communication for patients with amyotrophic lateral sclerosis-comparison between novice and experienced students using text-mining-

*Takemasa Ishikawa, Yugo Narita, Keiko Fukuroku, Erisa Takahashi, Chihiro Mizumoto (Mie University)

Abstract: Augmentative and alternative communication (AAC) has been used for amyotrophic lateral sclerosis (ALS) patients with severe communication difficulties. We planned a brief educational course for students in multiple healthcare disciplines. In 2018 we held 2 sessions more than 5 months apart. We set out to test a preliminary hypothesis that there would be a difference between novice students and an experienced group of students who had already attended the

session once, especially in terms of their ease in managing the AAC. We compared data from the second training session between 6 students (experienced group) who had attended the same session twice in March and August, and 6 new students (novice group) who had never experienced AAC before August. We measured the number of letters obtained by each AAC method and the participants' perceived burden before/after using AAC evaluated by a visual analog scale (VAS). We also asked the participants to write comments after using AAC. We compared the number of letters and the subjective burden between the two groups. Free-text comments were processed by text-mining software (KH Coder®). The burden of the Flick type of communication board was lower for the experienced group ($p=0.034$). Comparison of Difficulty/Ease of the two groups with KH Coder® suggested less difficulty in the experienced group ($p=0.002$). Text-mining of the free comments suggested some difference on Difficulty/Ease between the 2 groups with and without the experience of the educational course.

2-A-3: Exploratory Survey on the Subjective Meaningfulness of Digitization among Nurses at two Hospitals in Japan

*Yugo Narita, Makoto Suzuki, Shizu Hirohata, Takashi Koseko, Sachie Takeuchi, Chiharu Miyata, Mayumi Mizutani, Mayumi Okita, Yoshiko Takeda, Hiroki Funao (Mie University)

Abstract: This survey aimed to evaluate the subjective meaningfulness of digitization using electronic medical records among Japanese nurses at two hospitals. This was based on a suggestion by students from the Catholic University of Applied Sciences in Freiburg, Germany. Data for this cross-sectional, exploratory survey were collected using an anonymous paper-based questionnaire. Participants were clinical nurses aged less than 60 years working in intensive care units or acute wards at Mie University Hospital and Kinan Hospital. After research ethics committee approval, eligible participants received an explanation about the study and were invited to complete the questionnaire. Responses were retrieved in November 2018, and checked and translated into English. Free-text comments were processed using text-mining software (KH Coder). Seventy-one valid responses were retrieved. The valid response rate was 77% at Mie University Hospital and 84% at Kinan Hospital. Participants showed similar and positive perceptions of digitization (i.e., "To me digitization in my daily work is a good fit"). The selection of reasons for this perception showed similar patterns, although "Physical relief," was more commonly selected at Mie University Hospital than Kinan Hospital ($p=0.001$). Participants from the two hospitals also differed in terms of "Other reasons" and corresponding free-text comments. No nurses from Kinan Hospital provided comments, but over one-third of Mie University Hospital participants commented. The relationship analysis of the comments placed "information" at the center, surrounded by "share" and "easy." This survey showed most nurses perceived positive meaningfulness of digitization in clinical nursing. However, there may be some situation-based differences in meaningfulness.

2-A-4: Neural Prediction of the Target "to BUY" or "NOT to BUY" by the ERP-based Cognitive BMI

*Ryohei P Hasegawa, Yoshiko Nakamura, Yukako T Hasegawa, Hirohito Sawahata (Neurotech Res Grp, HIRI, AIST)

Abstract: We have been developing an EEG-based cognitive brain-machine interface (BMI) system, Neurocommunicator® to support patients with severe motor deficits in communication. This system uses an event-related potential (ERP) to decode the message (pictogram) that users want to convey. In addition to the communication aid, it would be expected for the Neurocommunicator to improve the QOL of the users in a variety of daily-life situations. In this study, we focused on brain activity that reflected the decision-making process of customers. We used the virtual shopping task as a model of daily shopping, in which a variety of product images were used as visual stimuli for the sequential delayed matching-to-sample paradigm. We recorded EEG data from 12 normal subjects and examined the ERPs in two conditions; the subject selected one (target) out of 8 products (nontargets) either "to BUY" (positive condition) or "NOT to BUY" (negative condition). We observed the strong ERPs not only to the 'target to buy' but also to the 'target not to buy' compared to the nontarget. The magnitude of the response and the decoding accuracy of the former were, however, greater than the latter. These results suggest that the ERP to a product is enhanced by the intention to buy it, and that the ERP-based Neurocommunicator has potential to become a 'body-free' shopping tool for patients with severe motor deficits as well as a real-time neuromarketing / neuroconsulting tool for any person.

2-A-5: Performance Improvement of Motor Imagery BCI by Multi-Mental Task

*Ryo Takahashi, Hisaya Tanaka (Kogakuin University)

Abstract: We studied on the MI-BCI (Motor Imagery Brain-Computer Interface). MI-BCI is an interface that operate a computer using changes in brain activity that appear when imaging moving a body part. For example, MI-BCI is possible to assign the left-hand motor imagery to the power ON/OFF command. The problem of MI-BCI is low performance, especially MI-BCI has few commands. We aimed to improve the performance of MI-BCI by adding the number of commands. Currently, MI-BCI commands are four commands using "left hand", "right hand", "legs" and "tongue" motor imagery. Therefore, we attempted to add the number of MI-BCI commands by classifying eight kinds of motor imagery brain activity "no imagery", "left hand", "right hand", "legs", "both hands", "left hand + legs", "right hand + legs", "both hands + legs". Motor imagery by multiple body parts "both hands", "left hand + legs", "right hand + legs", "both hands + legs" are called multi mental task. Multi mental task are combination of simultaneous motor imagery of left hand, right hand, and legs. This makes it possible to add the number of commands to 2N (N is number of body part). As a result, the performance of MI - BCI improved by adding the number of commands in 2 out of 3 subjects. Multi mental task is able to add the choice of MI tasks. Performance Improvement of MI-BCI was possible by choosing MI tasks with high accuracy.

2-B: Artificial Robotics and Computing (Room A0715) 15:00-16:40

2-B-1: Consideration on Transformation Matrix Clarifying Relationships between Impression Factors of Multimedia Data

*Teruhisa Hochin, Tomoki Maeda, Hiroki Nomiya (Kyoto Institute of Technology)

Abstract: This paper gives some considerations on a transformation matrix of the factor loading matrixes obtained through factor analysis often used in affective engineering. A transformation matrix transforms a factor loading matrix to another, and vice versa. It represents the relationship of two sets of factors. This paper tries to clarify accuracy and interpretation of the transformation matrix. Accuracy is theoretically explained. Interpretation is demonstrated by using an example.

2-B-2: Workflow Recognition from Knee Surgical Videos: Role of Deep Neural Networks

*Shoichi Nishio, Belayat Hossain, Manabu Nii (University of Hyogo), Takafumi Hiranaka (Takatsuki Hospital),

Syoji Kobashi (University of Hyogo)

Abstract: While surgery such as laparoscopic procedures are not complicated as the Orthopedic surgery, however, the latter has a large variety of surgical techniques. Furthermore, the procedures are complicated, and many types of equipment's have been using in the orthopedic surgery. So, nurses who deliver surgical instruments to surgeon are supposed to be forced to incur a heavy burden. As previous research, the navigation system for assisting operating room nurse in the field of orthopedic surgery (UKA) was proposed by us. But recognition video images of orthopedic surgery from smart glasses in our system is not satisfactory accuracy. This work proposes improving method for recognizing surgical procedure from video images of UKA, TKA by Deep Neural Network. Firstly, evaluated the recognition of surgical phases in orthopedic using convolutional neural network (CNN), and finally investigated the role of deep and densely connected neural nets like VGG16 and Dense Net for improving the recognition accuracy. The outcome confirmed the inclusion of deep and dense layers increases the recognition accuracy than that of traditional CNN.

2-B-3: Image Retrieval System Using Japanese Sound Symbolic Words for Surface Texture

*Koichi Yamagata, Tatsuki Kagitani, Maki Sakamoto (University of Electro-Communications)

Abstract: We propose a system to retrieve appropriate images from a database for a given Japanese sound symbolic word (SSW) expressing texture. We use some features of images calculated from gray-level co-occurrence matrices (GLCM). Using GLCMs and SSWs contribute reduction of calculation cost and easy operation of the system.

2-B-4: The Concept of Intelligent Space with a Robot

*Dorota Belanova (Kyushu Institute of Technology), Marián Mach, Peter Sinčák (Technical University in Košice), Kaori Yoshida (Kyushu Institute of Technology)

Abstract: Intelligent space is where people may easily interact with computers and robots, changing the environmental conditions based on users' needs to create more comfortable and satisfying surroundings. In our proposed system, we would integrate an intelligent space with a robot that would act as an active part of the environment. The system is illustrated in a few caregiver scenarios, showing the actions of a robot. The skills of a robot are explained, presenting the advantages and contributions of the system.

2-B-5: Development of a Font Comparison System Using Similarity Metrics

*Sho Takizawa, Taisei Hoshi, Qiu Chen (Kogakuin University)

Abstract: When choosing fonts, we use various tools to select the best font for the content. However, the degree of similarity of the same font calculated using different tools is different for each tool. In this research, we propose a font comparison system considering different similarity comparison methods by ranking similarity for each font. As a method to measure similarity, we use MSE, PSNR, SSIM, MSSSIM of image quality assessment and Euclidean distance and cosine similarity in t-SNE of dimensionality reduction. Relative relations among fonts were obtained by averaging similarity rankings of different similarity comparison methods.

Poster Session (Room A0762) 16:40-17:00

P-1: Quantification of emotional evaluation by establishing quantitative evaluation method of textile products using digital signal

*Jung taek Oh, Kyeong eun Lee (FITI Testing&Research Institute)

Abstract: Although the degree to which a human visually sense a wrinkle of a textiles product is graded on the basis of a visual evaluation called a sensory test, there are differences in the results depending on the condition of the judge, the personal experience, and the surrounding environment. Therefore, the 3D image of the wrinkle shape was obtained by using the 3D scanner for the AATTCC 3-Dimensional Wrinkle Recovery Replicas, and the wrinkle degree (height, change amount, etc.) was quantified through the digital image analysis. We aim to provide quantitative data for the development of textile products by establishing a system that can objectively evaluate the degree to which persons feel about wrinkles.

17:30 - 20:00

Banquet

Monday, 18th March

ISASE2019 Oral Presentation Sessions 3 (Room A0765 and A0715) 9:30 – 11:10

3-A: Affective Design (Room A0765) 9:30 – 11:10

3-A-1: The influence of cast shadows on “Deliciousness” perception in cakes

*Oscar Eduardo Sakay Rodriguez (University of Tsukuba), Masuko Soh (Rakuten Institute of Technology), Toshimasa Yamanaka (University of Tsukuba)

Abstract: Food images contain several visual elements, such as lightning, color, shapes, shadows, etc. While the influence of the mentioned above have been well studied, the influence of shadows on “Deliciousness” impression of food remains unexplored. Thus, this study investigated how does the strength of the cast shadow and the angle of the light source influence deliciousness perception. There were 38 participants which evaluated 4 experimental conditions regarding the strength of the cast shadow, and 3 experimental conditions regarding the angle of the light source. A total of 12 images were evaluated with the conditions described. In each condition, the participants rated how delicious they perceived the visual stimuli. The results showed that the cast shadows acts as a diminisher of the light, and that high lightning angles images rated better than the other light angle conditions when the presence of shadows is null or close to null.

3-A-2: Effect of Assistive Method on Sense of Fulfillment with Agency-Modeling with Flow Theory and Attribution Theory-

*Dan Nanno, Hideyoshi Yanagisawa (The university of Tokyo)

Abstract: According to the self-determination theory, we considered the disappearance of autonomy of product operation result in the decrease in sense of fulfillment of product use. The purpose of this study was to develop a mathematical model that explained the effect of sense of agency (SoA) on sense of fulfillment. For this purpose, we integrated the idea of judgment of agency (JoA), flow theory, and attribution theory. We formulated the effect of the locus of causality on skill and challenge using attribution theory. Self-determination theory explains the relationship between increased sense of fulfillment and autonomy needs that are fulfilled. The model explains the relationship in self-determination theory where sense of fulfillment increases when judgement of agency is internal. We conducted an experiment using a game task with different types of assistance to verify the hypothesis. Flow score was used as an indicator of sense of fulfillment between two assistance methods in which judgement of agency was changed according to ease of recognition of assistance. We assumed that the hard-to-recognize assistance made judgement of agency internal. As a result of the experiment on three subjects, the flow scores were high with the hard-to-recognize assistance. Therefore, the experimental result supported the hypothesis.

3-A-3: A Mathematical Model of Emotional Desensitization to Novelty-Modeling with Bayesian Update and Information Theory-

*Takahiro Sekoguchi, Hideyoshi Yanagisawa (The University of Tokyo)

Abstract: Novelty is an important factor of creativity in product design. Acceptance of novelty, however, depends on one's emotions. Raymond Loewy, a pioneer of industrial design, defined a broader term between attraction of novelty and fear of the unknown MAYA (Most advanced, yet acceptable), which is important for new designs that are widely accepted in society. Yanagisawa et al. (2019) developed a mathematical model of emotion dimensions associated with novelty such as arousal (surprise) and valence (positivity and negativity). The model formalized arousal as Bayesian information gain and valence as a function of arousal based on Berlyne's arousal potential theory. On the one hand, people get used to novelty by repeated exposure. This so-called desensitization to novelty is an important factor to consider in the design of long-term products experience. In this paper, we proposed a mathematical model of desensitization to novelty based on the emotion dimension model. We formalized the desensitization as a decrement of information gained from a novel event through Bayesian update. We derived the information gained from repeated exposure of a novel stimulus as a function of three parameters: initial prediction error, initial uncertainty and noise of sensory stimulus. With the proposed model, we found an interaction effect of initial prediction error and initial uncertainty on desensitization (decrement of information gain). Furthermore, we demonstrated that a range of positive emotions on prediction errors shifted towards more novel by repeated novelty exposure. The experimental results of previous studies supported this simulation results.

3-A-4: Difference between Human and Machine in Feeling about Similarity of Melodies

*Kanta Tachibana, Yuta Takagi (Kogakuin University)

Abstract: In this paper, we report the experimental result of examining the difference of feeling of human and machine to the similarity of melody. First of all, original melodies are divided into 4 groups for each work, and fake melodies similar to original ones are generated by Deep Convolutional Generative Adversarial Net (DCGAN). At that time, the discriminator of each GAN is learned so as to be able to evaluate the similarity with the work which is not learned. We ask ten subjects to evaluate impressions for melodies generated GANs, and calculate the similarity between melodies. We compare the similarity evaluation by human and that by machine.

3-A-5: Modelling of Non-Linguistic Utterances for Machine to Human Communication in Dialogue

*Ahmed Khota Khota, Kimura Asako, Eric W Cooper (Ritsumeikan University)

Abstract: Non-Linguistic Utterances (NLUs) present a potentially useful alternative communication channel between humans and machines. NLUs are potentially cheaper, and easier to implement, and not limited to the constraints of natural language and therefore may be appropriate in situations such as assisting tourists with various language backgrounds and needs. An experiment was done to establish ranges for NLU parameters such as pitch, duration, amplitude, and timbre. Subjects listened to randomly produced NLUs and selected applicable dialogue descriptors from: Positive, Negative, Greeting, Apology, Thanking, Hesitation, Question, Approval, Disapproval, Hushing, None of the Above. Factor analysis yielded 3 major factors, which were labeled as follows: 1) Affirmative vs Negative, 2) Questioning, and 3) Meaningful vs Indeterminate. NLUs with lower pitches, downward pitch patterns, and simpler timbres were found to be more Negative. Those with upward pitch patterns were more likely to be identified as a Question. In future work, new experiments will be used to develop a model of NLU inference and interpretation within a Dialogue in terms of the dominant descriptors and to test the model in applications for tourist support systems.

3-B: Affective Information (Room A0715) 9:30-11:10

3-B-1: The Evaluation of Affective Impression of Social Reading System Using Others' Comments

*Kazuya Matsumura, Hiroshi Nunokawa, Kiwamu Sato (Iwate Prefectural University)

Abstract: With the recent expansion of the “electronic book” (hereinafter called “e-book”) market, more readers are reading books by e-books. Accordingly, readers' experiences over the network are being shared among readers of e-books. These are said to be social reading, and are drawing attention as new social media. In social reading, there are things you read together with comments on the contents. What kind of affective influence does this have on readers? In this paper we report on the results of this survey.

3-B-2: Proposal for CAPTCHA that Makes Use of the Human Ability to Understand Context

*Jue Zhang, Masahiro Morita (Kogakuin University), Brian Henson, Bryan Matthews (University of Leeds)

Abstract: For the visually impaired, it is difficult to use CAPTCHA that was generated using visual information. The only way is to install a browser add-on and, by eliminating CAPTCHA, to collect information from the internet. However, it is not easy for visually impaired people to install an add-on, and there will also be disadvantages for general users if anyone is able to eliminate the CAPTCHA function. As such, using text that can be converted into voice, we proposed a sentence rearranging format of CAPTCHA that makes use of the human ability to understand context. Through experiments, we examined the kind of sentences, number of Japanese characters, number of sentences, and special characteristics of sentences that the sentence rearranging format could accommodate. Our conclusion was that, primarily, humans find it easy to understand context to the extent that the subject of the sentence is clearly indicated and is linked to the content of the sentence, that it is appropriate to use four sentences or fewer as multiple-choice options in problem sentences, and that less than 100 Japanese characters is ideal for the number of characters.

3-B-3: Quantification of Different Pedaling Strategies in Inter-Lower Limbs between Cyclists of Different Road Racing Experiences

*Takuhiko Sato, Shota Shigetome, Tatsushi Tokuyasu (Fukuoka Institute of Technology)

Abstract: Gaining insight into the prevention of localized muscle fatigue has been an urgent challenge in cycling competitions. While studies have investigated muscle coordination only in a single lower limb in order to clarify efficient pedaling, known as pedaling skills, one of the cyclists' pedaling strategies, few studies have assumed a kind of asymmetrical muscle coordination in both the left and right lower limbs. In this paper, the authors aimed to quantify the difference in the strategy between road cyclists with different cycling experiences by investigating the structure of inter-lower limb muscle coordination. Six healthy male cyclists with different cycling experiences were volunteered: club cyclists for more than 4 years ($n = 3$) and elite cyclists for more than 10 years ($n = 3$). As they pedaled for 30 seconds under the experimental condition of 150 W at 90 rpm, we measured a total of 10 muscle activity patterns from the lower limbs by using surface electromyography and a crank rotational angle. Next, we extracted the muscle coordination to explain how both the lower limbs coordinate to employ skills by applying non-matrix factorization. The results found asymmetrical muscle activity patterns between the lower extremities regardless of cycling experience, which indicated muscle coordination compensating for the asymmetry to raise pedaling efficiency. These findings should contribute to understanding not only different pedaling strategies but also to preventing localized muscle fatigue. Future work should investigate the muscle coordination pattern of both lower limbs against the effect of muscle fatigue.

3-B-4: Investigation of Factors Producing a Sense of Virtual Reality Using Substitutional RealityInvestigation of Factors Producing a Sense of Virtual Reality Using Substitutional Reality

*Momoka Kinoshita, Katsuyoshi Sai, Jue Zhang, Hisaya Tanaka (Kogakuin University)

Abstract: Substitutional reality (SR) technology blurs the boundary between the real and the virtual by unnoticeably substituting past images for live images. In this study, we further investigated such factors, and conducted experiments to verify whether they were indeed effective factors in SR. In the verification experiments, the subject was presented with an image in which two persons appear, wearing head-mounted displays (HMDs) and photographed in advance; after which it was explained that one person was in a live image and the other in a past image, and the subject was asked which was the live image. In the case where the psychological / social distance was reduced by performing cooperative action to imitate the action of the opponent, when the line of sight matches with that of only one person; and in the case of two patterns, when one person goes in and out of the personal space and does not shake or wave their hand; these three factors were verified. In the comparative experiment, the same past / live image content as in the verification experiment was employed. The results suggested that it is ineffective to conduct cooperative actions to reduce the psychological and social distance, and to enter and exit the personal space without waving. And further, it is effective when the gaze matches and when the personal space is entered / left with a hand wave. In sum, it was found that SR reality can be enhanced by adding communication.

3-B-5: Further Tendency of Obtaining Potential Appropriate Respondents to Questions at Q&A Sites through Additional Categories

*Yuya Yokoyama (Kyoto Prefectural University), Teruhisa Hochin, Hiroki Nomiya (Kyoto Institute of Technology)

Abstract: In order to eliminate mismatches between the intentions of questioners and respondents of Question and Answer (Q&A) sites, nine factors of impressions for statements have experimentally been obtained. Factor scores are then estimated by using the feature values of statements. So far the possibility of searching respondents capable of giving appropriate answers to a newly posted question has been established for Auction, PC and Love. It has been shown that the distance and the number of appearance may help us select users who can give appropriate answers to a question. In the similar fashion, this paper tries to find

the possibility of detecting respondents who can appropriately answer a newly posted question for other categories such as Internet, Politics, etc. As a result of analysis, several newly regarded categories shows the similar tendency as the previous analysis, while some categories related to Yahoo! JAPAN show less outstanding tendency.

4-A: Engineering Design Education and Project Based-Learning (Room A0765) 11:30-13:10

4-A-1: Increasing the Chance of Interest Learning in the User-Aware Information Distribution System Using a Smart Watch

*Takuya Ogawa, Takuya Fujihashi, Keiichi Endo, Shinya Kobayashi (Ehime University)

Abstract: In order to solve information overload in news information on the Internet, smartphone applications that provide news suitable for personal interests have been developed in previous research. However, if the user does not use the application, even if interesting news is distributed, since the news is not browsed, a loss of opportunity to learn the user's interest in the application has occurred. In this research, in order to prevent the loss of learning opportunities, we proposed an information distribution application that facilitates startup and browsing using smart watch. As a result of evaluation, no increase in the number of times of learnings was seen by using smart watch with this application. The cause is that the information displayed on the smart watch with a small screen size does not satisfy the amount of information desired by the user. Devices to provide users with saved information are required.

4-A-2: Design of International Engineering Design Challenge (IEDC)

*Hidetsugu Suto (Muroran Institute of Technology)

Abstract: A series of workshops, called International Engineering Design Challenge (IEDC), is introduced. This series of workshops are held by three Japanese universities and two Thai universities. The main goal of the workshops are educating participants group work skills with divers background members. In the workshops, students tried to create a solution for an open question through group works. In this paper, the history of the workshops are shown, and the design concepts are discussed.

4-A-3: Systems Thinking Approach to Visualize Problem Structure of Drug Ingestion Accidents by Infants-Identifying its causal relationships and visualizing overall structure

*Naoshige Akita, Yoshitsugu Morita (Kyushu University), Hisao Shiizuka (SKEL Shiizuka Kansei Engineering Laboratory)

Abstract: There has been no end to cases of infants opening drug containers meant for adults and accidentally ingesting them, and so it has become a social problem. The authors conducted experiments to evaluate child-resistant (CR) pill containers, which infants find difficult to open, and are also not difficult for ordinary people to use. In this paper, based on the findings of these experiments, we implemented systems thinking and interpreted human activities as an open-ended system, visualized the problem structure of drug ingestion accidents by infants, and were able to demonstrate modifications for preventing accidental ingestion by infants and matters requiring caution.

4-A-4: Effects of Idea Sketching and Storyboards on the Design of Playground Equipment

*Yuichi Izu (Shizuoka University of Art and Culture)

Abstract: Design spans a wide range from the design of things, which targets color and form of products, to the design of experiences, which targets user experience in systems and services in recent year. In the design of things, many display techniques such as sketching and prototyping have been utilized to obtain optimal designs. Although the importance of display techniques is also recognized in the design of experiences, the techniques used in the design of experiences are often considered as applications of techniques used in the design of things. This study aims to obtain knowledge about the role and impact of the development of effective display techniques in the design of experiences. Specifically, the effect of design sketching, which is often used for product design, is compared to the effect of storyboarding, which is often used for animation production, in design exercises for college students with the theme of playground equipment.

4-A-5: The held report of International Engineering Design Challenge

*Makiba Sakamoto (Gifu City Women's College), Hidetsugu Suto (Muroran Institute of Technology), Matsunobu Nomura (Akita University of Art), Patchanee PATITAD, Woramol CHAOWARAT WATANABE (Naresuan University)

Abstract: Authors conducted a workshop as an experiment to improve the engineering design ability and international sense of college students. Six Japanese students and 11 Thai students participated in the workshop. 17 students were divided into 4 teams and they proposed a new communication medium for each team. The students received several lectures and group work for the proposal. The students answered a questionnaire before and after participating in the workshop. As a result of analyzing the questionnaire, Japanese students realized that their ability was improved more than Thai students. In addition, students in other fields than engineering students said that their abilities improved.

4-B: Multisensory Perception and Cognition in Affective Science (Room A0715) 11:30-13:10

4-B-1: Two Preliminary Studies on Whether Multisensory Stimulation Reinforces Working Capacity and Stress-Reduction Effect

*Takashi Sakamoto (AIST), Aina Yamasaki, Yusuke Kishine (Chuo University), Mai Yanagawa (Air Aroma Japan), Toshikazu Kato (Chuo University)

Abstract: This paper reports the results of two separate experiments on the reinforcement of working capacity and the effect of stress-reduction, by multisensory stimulation. First experiment on auditory stimulation and lighting stimulation revealed that multisensory stimulation, a combination of green light and murmuring of a stream, had more stress-reduction effect than single-sensory stimulation. Second experiment on smell stimulation and lighting stimulation revealed that a peppermint scent had the effect to reinforce working capacity of arithmetic calculation. Also green light combined with a peppermint scent played a supportive role for reinforcing the working capacity. Such multisensory interaction cannot be explained only by the effects of a simple combination of single-sensory stimulation.

4-B-2: Multisensory Integration: Effect of lighting, sound and ambient scenting to support discussions in the presentation room

*Mai Yanagawa (Air Aroma Japan), Haruyuki Yoshinaga (KANSEI Projects Committee), Izumi Takahashi (Seiwa Business Co., Ltd), Seiya Enomoto (JVC KENWOOD Victor Entertainment Ltd), Takashi Sakamoto (AIST), Toshikazu Kato (Chuo University)

Abstract: Multimodal stimuli are believed to provide greater and richer perceptual experience than that is caused by unisensory information. This study looks at the nature of crossmodal interactions between visual, auditory and olfactory modalities which occur in the same time and space to find out the optimal combinations of light setting, sound and ambient scenting to psychologically support different activities in the presentation room. The experiment was conducted in the actual presentation room where 4 types of light setting, high-resolution nature sound and ambient scenting are manipulated and 5-Scale Semantic Differential evaluations with 28 KANSEI words were conducted for 24 space samples with unimodal, bimodal and trimodal combinations. Later applying Principal Component Analysis to see semantic differences how unimodal vs bimodal vs trimodal cues from these products created single or combined effects on

people's feeling in the space. Visual cues from light setting seemed to create greater variance than crossmodal interactions of auditory-olfactory stimuli, however, each constituent sense modality contributes differently to the integrated perception. This method can be used for verbalizing features how each modality occurring simultaneously functions in the integrated experience. It also enables us to select optimal combinations for products with sensory cues such as lighting, sound and ambient scenting in the space design.

4-B-3: Expression of music by colors

*Tadayuki Wakata (Waseda University)

Abstract: Music comprises numerous components and is thus difficult to express. If an image of music could be visually articulated, smoother communication could be achieved. Previous research has demonstrated that color is able to express impressions, and this study aims to express music through colors. Two experiments were conducted. Experiment 1 evaluated the impression of music and 40 compositions of varied genre were used as stimuli. Color stimuli were selected from the Practical Color Co-ordinate System (PCCS). 12 tones, 12 hues, and achromatic colors (in total 25 color stimuli) were used. Impressions were assessed using the 7 step Semantic Differential (SD) method that utilized 20 adjective pairs. Subjects first evaluated the impressions they received from the music, then selected colors that matched or mismatched those impressions. The music stimuli used in experiment1 were also employed for Experiment 2, which pertained to the expression of music through colors and an application was used for this purpose. The expression of the music was accomplished in two parts: by tone, and by hue through achromatic color. Subjects changed the size of the color patches displayed on the screen of the application to express the music they heard using colors. Results were recorded for each stimulus with each color designated a numerical value between 0 and 100. The results of the factor analysis for impression data revealed four factors. The regression analysis demonstrated that color expressions using tones in Experiment 2 corresponded to these factors.

4-B-4: Music Playlist Generation System for Changing a Listener's Mood to a Positive State

*Akihiro Ogino, Yuta Uenoyama (Kyoto Sangyo University)

Abstract: The purpose of this paper is to propose an automatic music playlist generation system that makes people's mood positive state. The system designed two types of the playlist: mood-boosting and mood-stabilizing. Both types have four patterns, and they have a different structure that shifts a listener's mood. For making a playlist, the system calculated the probability of an impression of all audio tracks by using the multinomial mixture model. Also, it chooses the audio tracks for a playlist using the probability. For calculating using the model, this study extracted 30 kinds of music feature data from 1,500 pieces of sample tracks. It also received the tagged data of expressing the five impressions of these tracks from 13 Japanese people. This study evaluated every four patterns of the playlist of mood-boosting and mood-stabilizing using the multiple mood scales method. As for all playlists, the result showed the indicator of negative moods after listening to a playlist decreased from the index before listening. Also, the index of active feelings in playlists of mood-boosting and the index of passive feelings in playlists of mood-stabilizing had increased. In conclusion, the results indicated that the proposed system could design playlists of both mood-boosting and mood-stabilizing that shift a listener's mood to a positive state.

4-B-5: Effects of Three Attributes of Color Including Tone on Olfactory Impression

*Masato Sakurai (Shizuoka Institute of Science and Technology)

Abstract: To examine the effect on the olfactory impression by color stimuli from the aspects of the three attributes of color (hue, lightness, and chroma) and tones the seven types of olfactory impression for the color stimuli were measured using the subjective evaluation of five-point scale. The color stimuli were uniformly selected from twelve tones in PCCS and the achromatic colors of N1 to 9 added, the amount of color stimuli was 153 in total. The participants were asked to subjectively evaluate the olfactory impression of seven types (vanilla type, mint type, herb type, floral type, citrus fruit, soap, and putrid odor) for the stimulus presented by the display using the five-point scale. In the results of floral, mint, and citrus fruit smells, the evaluation values increases with the values of lightness and/or chroma of the hues of 6RP, 3G, and 8YR, respectively. Also in the results of soap and vanilla smells, the evaluation values reach to the peak on 5B and 5Y or 8YR in pale and light greyish tones. Therefore, there is the relationship between the olfactory impression and three attributes of color including the tone as well as the previous studies.

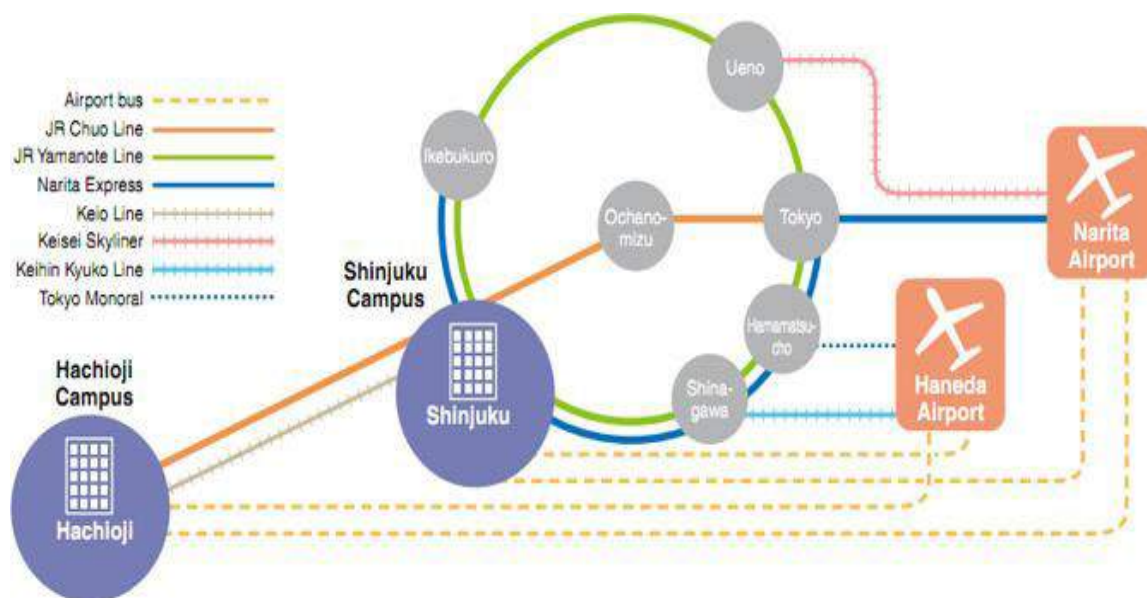
Access Map

Kogakuin University, Shinjuku Campus

1-24-2 Nishi-Shinjuku, Shinjuku-ku, Tokyo 163-8677

Tel: 03-3342-1211 (main switchboard)

Transportation from Narita & Haneda Airport



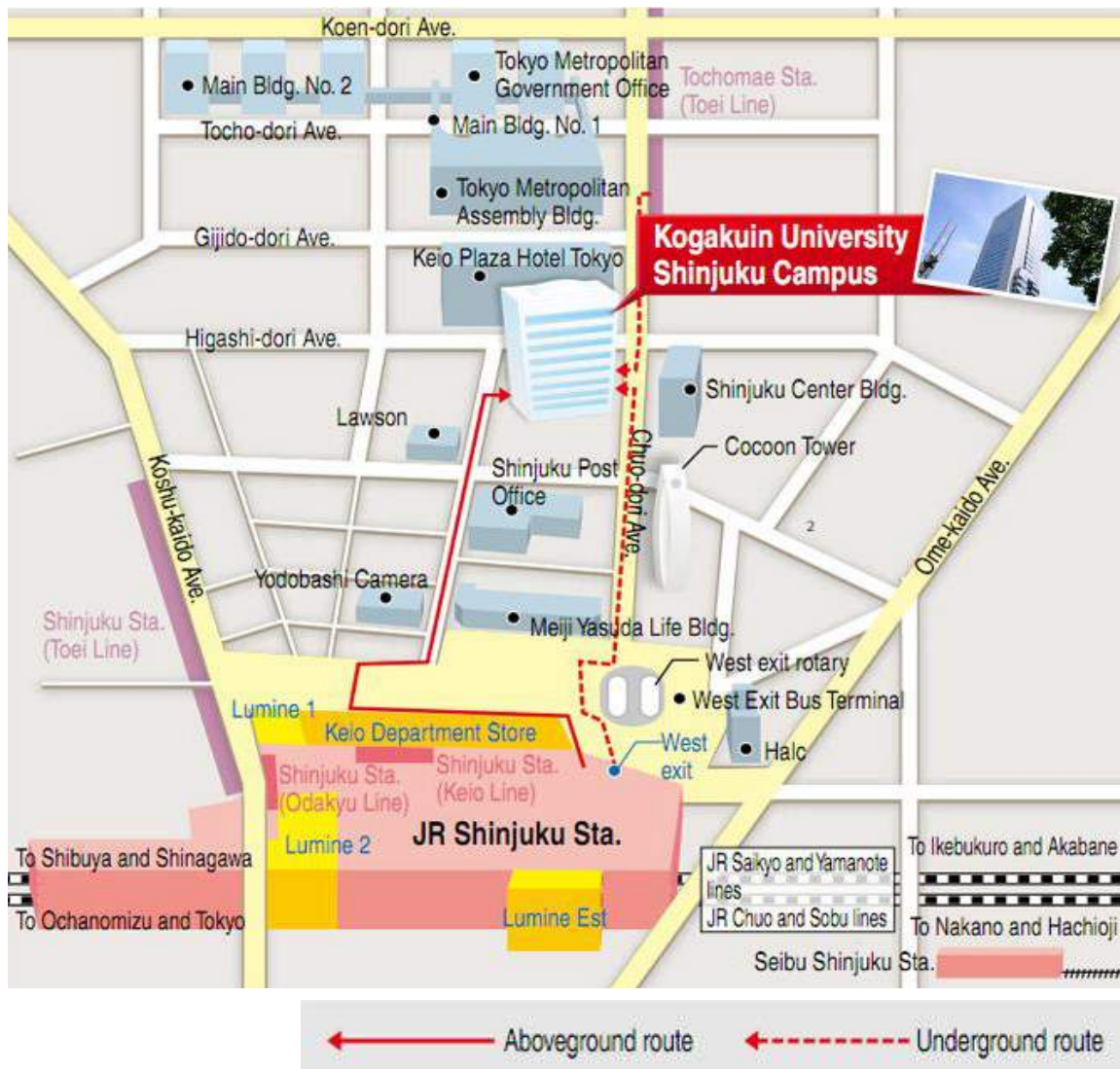
Narita Airport	Narita Express (approx. 80 min.)		Shinjuku
Narita Airport	Keisei Skyliner (approx. 60 min.)	Ueno	Shinjuku
Narita Airport	Airport bus (approx. 85 min.)		Shinjuku
Narita Airport	Airport bus (approx. 160 min.)		Hachioji
Shinjuku	JR Chuo Line (approx. 35 min.)		Hachioji
Shinjuku	Keio Line (approx. 34 min.)		Hachioji
Haneda Airport	Airport bus (approx. 35 min.)		Shinjuku
Haneda Airport	Airport bus (approx. 75 min.)		Hachioji
Haneda Airport	Keihin Kyuko Line (approx. 13 min.)	Shinagawa	Shinjuku
Haneda Airport	Tokyo Monorail (approx. 13 min.)	Hamamatsucho	Shinjuku

Access Map

Kogakuin University, Shinjuku Campus

1-24-2 Nishi-Shinjuku, Shinjuku-ku, Tokyo 163-8677

Tel: 03-3342-1211 (main switchboard)



- A five-minute walk from JR Shinjuku Station, west exit
- A five-minute walk from Shinjuku Station on the Keio, Odakyu, Toei, or Tokyo Metro lines
- A three-minute walk from Tochomae Station on the Toei Oedo Line
- A 10-minute walk from Seibu Shinjuku Station on the Seibu Shinjuku Line

Floor 7, Venue Map

