

The International STRESS AND BEHAVIOR Society (ISBS)
Yamaguchi University, Yamaguchi, Japan

Program & Proceedings



16th International Regional (Asia) ISBS Neuroscience and Biological Psychiatry “Stress and Behavior” Conference



September 3-5, 2022, hybrid (ONLINE and OFFLINE)

COMMITTEES:

Conference Chair:

Prof. Mamiko Koshiba, PhD (Yamaguchi/Saitama/Miyagi, Japan), LOC Chair

Conference Committee:

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Prof. Takashi Kuremoto, PhD (Saitama, Japan)

Prof. Masanori Shukuya, PhD (Kanagawa, Japan), Chair

Focus:

The conference will exchange and share the developing knowledge base of biological psychiatry and behavior with the particular focus on stress caused by natural and social disasters, abuse, social withdrawal and related stress-evoked neuropsychiatric disorders in general, including aspects relevant to education, psychology, technology, and engineering.

Anyone and Any Generation interested in stress-related human or animal behaviors are welcome to join the symposium.

Prohibition:

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Requirements for Participants:

All participants including speakers and audience members must pre-register (https://www.isbsjapan.org/?page_id=166&a=edit) with their family name and affiliation, which should be shown as the users' abbreviated ID when you connect zoom URL of "ISBS Asia Stress Behavior Yamaguchi". If the pre-registered name and affiliation are not shown, the connection will be rejected. The zoom URL will be shared on September 1st. Speakers should connect to Zoom at least two presentations before your talk.

Zoom Address for both days:

<https://us02web.zoom.us/j/83220566330?pwd=R2pnanV3WVJ6cWpWdGxhcEVVDK1JXZz09>
meeting ID : 832 2056 6330 Pass Code: 293776

Day 1. Saturday, September 3, 2022

ONLINE, zoom URL and Offline at Yamaguchi University, Tokiwa Campus, Ube, Japan

08.30-19.30 CONNECT zoom with pre-registered ID and affiliation.

08.50-09.00 ISBS OPENING CEREMONY AND WELCOMING ADDRESSES: Mamiko KOSHIBA (Japan)

Morning session

09.00-11.10 SYMPOSIUM 1. EDUCATION 1. Chair: Yoshiki MIZUKAMI (Japan)

09.00-09.20 EFFECTS OF COMPREHENSIVE LEARNING AT UNESCO ASSOCIATED SCHOOLS, ETC. Takahiro NAKAGUCHI, Shibaura Institute of Technology (Japan)

09.20-09.40 A NEW CHALLENGE OF STUDYING ABROAD – INTRODUCTION OF VIRTUAL REALITY ENGLISH LESSON. Chisa YAMADA¹, David READ², Nami ASAKAWA¹, Hirotohi MORI¹, Masanori WATANABE¹, Masato MIKAMI¹, [1] Yamaguchi University (Japan), [2] The University of Sheffield (UK)

09.40-10.10 ENGLISH LEARNING SYSTEM FOR REDUCING LEARNERS' STRESS. Yoshiki MIZUKAMI, Yoshiyasu MATSUNAGA, Kazuaki NEKODA, Atsushi NOMURA, Yamaguchi University (Japan)

10.10-12.15 SYMPOSIUM 2. PEDIATRICS. (ABUSE, COVID-19, COMPRESSION, SURVEY)
Chair: Mamiko KOSHIBA (Japan)

10.10-10.30 A PARENTAL ABUSE AND INTERVENTION CASE IN COMMON MARMOSSET MODEL. Mayuko YODA¹⁻², Hideo YAMANOUCHE², Yoshimasa KAMEI², Mamiko KOSHIBA¹⁻³, [1] Yamaguchi University, [2] Saitama Medical University, [3] Tohoku University (Japan).

10.30-11.00 EPIGENETIC MODIFICATIONS REGULATING PROSOCIALITY AND ITS INFLUENCE OF CHILD MALTREATMENT. Shota NISHITANI, Akemi TOMODA, University of Fukui (Japan).

11.00-11.20 A QUALITATIVE STUDY OF NURSES' SPEAKING APPROACH TO UPSET PARENTS IN NICU UNDER COVID-19 VISITING RESTRICTIONS. Yumika BABA, Toshiro MATSUBARA, Mayo YOSHIGA, Hitomi MITSUI, Tamami NAKAMURA, Yuko FUJII, Naoko HIGUCHI, Rieko YOSHIHARA, Shin NAKAGAWA, Yamaguchi University (Japan).

11.20-11.40 INVESTIGATION OF THE EFFECT OF COMPRESSION STRESS INDUCED DEFORMATION ON THE BLOOD FLOW IN ANTERIOR SPINAL ARTERY. Weiyue CHEN, Fei JIANG, Xian CHEN, Yamaguchi University (Japan).

11.40-12.10 IMPLEMENTATION OF WEB-BASED STRESS CHECK SYSTEM FOR CHILDREN TO PROMOTE MENTAL HEALTH. Miyuki FURUKAWA, Seiichiro HORI, Eiji SHIMIZU, Chiba University (Japan).

Afternoon session

12.40-14.00 SYMPOSIUM 3. MEDICAL BIOLOGY. (RESPIRATORY, BRAIN)

Chair: Shota NISHITANI (Japan)

12.40-13.00 **EXPLORING RELATIONSHIP BETWEEN MUSCLE CONTRACTION AND RESPIRATORY FUNCTION: DYNAMIC ANALYSIS OF THE DIAPHRAGM MUSCLE CONTRACTION.** Chenyang LIANG, Fei JIANG, Xian CHEN, Yamaguchi University (Japan)

13.00-13.30 **SUSCEPTIBILITY-WEIGHTED IMAGING (SWI) IN NEONATES WITH INTRACRANIAL HEMORRHAGE.** Hiroko KAKEI¹, Hayato SAKURAI¹, Mamiko KOSHIBA¹⁻³, Testuya KUNIKATA¹, Hideo YAMANOUCHI¹, [1] Saitama Medical University, [2] Yamaguchi University, [3] Tohoku University (Japan)

13.30-14.00 **MATCHING THE RIPLE-WAVE TO THE EPISODIC MEMORY-A CASE STUDY OF RAT.** Takashi KUREMOTO¹, Junko ISHIKAWA², Takaaki SASAKI², Shingo MABU², Dai MITSUSHIMA², [1] Nippon Institute of Technology, [2] Yamaguchi University (Japan).

14.00-16.30 SYMPOSIUM 4. CHILD DEVELOPMENT. (DISABILITIES, INTERVENTION)

Chair: Mamiko KOSHIBA (Japan)

14.00-14.20 **AI TO EXTRACT SKELETONS IMPLIED EDUCATIONAL EFFECTS OF A SWINGSET GENERATED BY NATURAL MATERIALS, FOR CHILDREN'S SOCIALIZATION AND INDEPENDENCE ESTABLISHMENT** Fusako TOMOTO¹, Kosuke IWASHIRO¹, Makoto OTA¹, Yoshiki MIZUKAMI¹, Masanori HARIYAMA³, Mamiko KOSHIBA¹⁻³, [1] Yamaguchi University, [2] Saitama Medical University, [3] Tohoku University (Japan)

14.20-14.40 **A TRAINING APPLICATION TO LEARN SOCIO-ENVIRONMENTAL ADAPTATION USING A TABLET WITH A BIOMETRIC SENSOR FOR CHILDREN WITH DEVELOPMENTAL DISABILITIES.** Kenji ITO¹, Mamiko KOSHIBA¹⁻³, [1] Yamaguchi University, [2] Saitama Medical University, [3] Tohoku University (Japan)

14.40-15.40 **KEYNOTE LECTURE 1. NEURODEVELOPMENTAL DISORDERS IN CHILDREN.** Makiko KAGA, Tokyo Metropolitan Tobu Medical Center for Children with Developmental Disabilities, National Center of Neurology and Psychiatry (Japan)

15.40-16.00 **AN EXTREMELY NEURONAL LEARNING SYSTEM OF MOTOR AND PSYCHO-COGNITIVE FUNCTIONS BRIDGING BETWEEN REALITY AND VIRTUAL REALITY ON HIGHLY TIGHT WALKING WITH ASSISTIVE APPARATUS,** Nao MIYOSHI, Poser Co, Yamaguchi University (Japan)

16.00-16.30 **A JUVENILE POLY I:C RAT MODEL FOR AUTISM: MATERNAL IMMUNE ACTIVATION, NEUROINFLAMMATION AND EPIGENETIC MODULATION.** Chao DENG, School of Medical, Indigenous and Health Sciences, University of Wollongong; Antipsychotic Research Laboratory, Illawarra Health and Medical Research Institute, Wollongong, NSW (Australia)

- 16.30-18.40 SYMPOSIUM 5. EDUCATION 2.**
Chair: Luke SANTAMARIA (New Zealand)
- 16.30-17.00 TOUCHSCREEN TABLET USE AND NON-USE IN NEW ZEALAND'S EARLY CHILDHOOD: REPORTS FROM A MIXED METHOD PHD STUDY.** Luke SNTAMARIA, Alumnus of Victoria University of Wellington (New Zealand).
- 17.00-17.20 CHILDREN SUMMER SOCIALIZATION IN WATER SLIDES ALONG THE EXISTING SLOPES.** Zhudi HUA¹, Ting TAO¹, Risa AKITA¹, Tomofusa AKITA¹, Masanori HARIYAMA³, Hayato SAKURAI², Mamiko KOSHIBA¹⁻³, [1] Yamaguchi University, [2] Saitama Medical University, [3] Tohoku University (Japan)
- 17.20-18.40 VIDEO "OF CHICKS AND BABIES. HOW TO BUILD A SOCIAL BRAIN BASED ON ANIMACY DETECTORS" WITH POST-DISCUSSION.** Giorgio VALLORTIGARA, University of Trento (Italy)
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- 18.40-19.00 DAY 1 CONFERENCE DISCUSSION WITH DRINKS**

Day 2. Sunday, September 4, 2022

ONLINE, zoom URL and OFFLINE at Yamaguchi University, Tokiwa Campus, Ube, Japan

09.00-18.30 REGISTRATION

Morning session

- 09.00-10.00 SYMPOSIUM 6. BODY PHYSICS AND BEHAVIOR.**
Chair: Tsuyoshi MORIYAMA (Japan)
- 09.00-09.20 BODY PHYSICS CONSIDERATION IN BONES OF A BOTTLENOSE DOLPHIN WITH 3D SCANNING AND PRINTING FOR ROBOT SIMULATION OF THE SWIMMING DYNAMICS.** Koji OKUTO¹, Masaaki IKEDA², Fumitake FUJII¹, Mamiko KOSHIBA¹, Takashi SAITO¹, [1] Yamaguchi University, [2] National Institute of Technology, Tokuyama College (Japan)
- 09.20-09.40 A STUDY ON VISUALIZATION OF "ACTIVITY VOLUME" ABOUT PLAYERS IN VOLLEYBALL.** Makoto OTA¹, Kosuke IWASHIRO¹, Fusako TOMOTO¹, Mamiko KOSHIBA¹⁻³, [1] Yamaguchi University, [2] Saitama Medical University, [3] Tohoku University (Japan)
- 09.40-10.00 MENTAL STRESS AND SUPPORTS FOR CHILDREN IN CRISIS - A CASE STUDY ON PRE-SCHOOL AND ELEMENTARY SCHOOL.** Yuko MIKI, Toe TANIMOTO, Teikyo University (Japan)
- 10.00-12.40 SYMPOSIUM 7. SOCIAL COGNITION.**
Chair: Allan V KALUEFF (Russia)
- 10.00-10.30 COMPUTER ASSISTED ANALYSIS OF FACES AS THE STRESS INDICATOR.** Tsuyoshi MORIYAMA, Tokyo Polytechnic University (Japan)

- 10.30-10.50 DEVELOPMENT OF EDUCATIONAL AI TO ENCOURAGE CHILDREN TO PROGRAM AND CO-CREATE WORKS.** Kosuke IWASHIRO¹, Ting TAO^{1,2}, Fusako TOMOTO¹, Makoto OTA¹, Zhudi HUA¹, Tomofusa AKITA¹, Michinori SUMIMOTO¹, Hirota FUJIMORI¹, Yumika BABA¹, Hayato SAKURAI², Masanori HARIYAMA³, Shinya SENBA⁴, Mamiko KOSHIBA^{1,3,4}, [1]Yamaguchi University, [2] Saitama Medical University, [3]Tohoku University, [4]Ube College National Institute of Technology (Japan)
- 10.50-11.50 KEYNOTE LECTURE 2. HOW DOES JUVENILE SOCIAL ISOLATION IMPACT ADULT SOCIAL BEHAVIOR? - DEVELOPMENTAL MISMATCH MODEL.** Hirofumi MORISHITA, Mindich Child Health & Development Institute, Friedman Brain Institute, Icahn School of Medicine at Mount Sinai (USA)
- 11.50-14.00 SYMPOSIUM 8. DIGITAL MEDIA AND SUPPORT.**
Chairs: Shun NAKAMURA (Japan), Hironobu MORISHITA (USA)
- 11.50-12.10 VIRTUAL AND AUGMENTED REALITY WORKSHOPS FOR JUNIOR HIGH SCHOOL STUDENTS' INTERNATIONAL CULTURE EXCHANGE BETWEEN WEIHAI AND UBE CITIES.** Kiryu UTANO¹, Ting TAO^{1,2}, Kosuke IWASHIRO¹, Mamiko KOSHIBA¹⁻³, [1] Yamaguchi University, [2] Saitama Medical University, [3] Tohoku University (Japan)
- 12.10-12.40 LUNCHEON LECTURE 3. GAMING DISORDER IN JAPAN AND ASIA.**
Shun NAKAMURA, Tokyo University of Agriculture and Technology (Japan)
- 12.40-13.00 BREAK**
- 13.00-13.20 EXPLORATION AND VERIFICATION OF EEG-TARGETED FOREHEAD REGIONS FOR NEUROFEEDBACK TO RELIEVE A STRESSOR, CHRONIC PAIN.** Kazuyuki ODA¹, Nobuyoshi KOIWA², Mamiko KOSHIBA^{1,3,4}, [1]Yamaguchi University, [2]University of Human Arts and Sciences, [3]Saitama Medical University, [4]Tohoku University (Japan)
- 13.20-13.40 A REPORT ON THE CURRENT STATUS AND FUTURE POTENTIAL OF THREE RESEARCH TOPICS RELATED TO GUQIN.** Shun KUREMOTO¹, Mamiko KOSHIBA¹⁻³, [1] Yamaguchi University, [2] Saitama Medical University, [3] Tohoku University (Japan)
- 13.40-14.00 LARGE SCALED DIGITAL LED AND SOUND INTEGRATIONS MIGHT ACTIVATE BRAIN WITH FUNCTIONAL COMPENSATE FOR LIMITED INFORMATION STRESS.** Shinichi SAKAMOTO¹, Mamiko KOSHIBA¹⁻³, [1] Yamaguchi University, [2] Saitama Medical University, [3] Tohoku University (Japan)

Afternoon session

- 14.00-15.30 SYMPOSIUM 9. ENERGY.**
Chair: Shun NAKAMURA (Japan)
- 14.00-15.00 KEYNOTE LECTURE 4. INSIGHTS OBTAINED FROM EXERGY RESEARCH ON BUILT ENVIRONMENT THAT COULD AFFECT THE HUMAN STRESS AND BEHAVIOR.** Masanori SHUKUYA, Tokyo City University (Japan)

- 15.00-15.30 SUPPLY OF GREEN ELECTRICITY THROUGH THE LIVING PLANTS MICROBIAL FUEL CELLS (PMFCS).** Azizul MOQSUD, Yamaguchi University (Japan)
- 15.30-18.30 SYMPOSIUM 10. PROFESSOR MITSUHIRO YOSHIOKA MEMORIAL SYMPOSIUM: HUMAN AND MODEL ORGANISMS.** Chair: Shun NAKAMURA (Japan)
- 15.30-16.40 INTRODUCTION: TRIBUTE TO PROFESSOR M. YOSHIOKA (1958-2021)**
- 15.40-16.30 ISBS PLENARY LECTURE: ZEBRAFISH, BRAIN AND BEHAVIOR,** Allan V Kalueff, Saint Petersburg State University (Russia)
- 16.30-16.50 QUANTITATIVE EVALUATION OF GLIAL CELLS UNDER HYPOXIC-ISCHEMIC STRESS USING THE COMMON MARMOSET NEONATAL MODEL.** Ting TAO^{1,2}, Rie SUGE², Hideo YAMANOUCI², Yoshimasa KAMEI², Mamiko KOSHIBA^{1,3}, [1] Yamaguchi University, [2] Saitama Medical University, [3] Tohoku University (Japan)
- 16.50-17.20 TARGETING COMMON INTER-SPECIES GENE EXPRESSION PATTERNS IN RNA-SEQUENCING DATA OF AFFECTIVE DISORDERS.** Demin KA, Krotova NA, Ilyin NP, Galstyan DS, Kalueff AV, Institute of Experimental Medicine, Almazov National Medical Research Centre; Institute of Translational Biomedicine, St. Petersburg State University, St. Petersburg; ZENEREI Research Center, Slidell, LA, USA; Russian Research Center of Radiology and Surgical Technologies, Ministry of Health, St. Petersburg, Russia; Ural Federal University, Ekaterinburg, Sirius University, Sochi, Russia (Russia)
- 17.20-18.00 APNEIC SNORING AND SIMPLE SNORING DISCRIMINATION FOR SLEEP QUALITY EVALUATION.** Lurui WANG, Zhongwei JIANG, Yamaguchi University (Japan)
- 18.00-18.30 LIFELONG DEVELOPMENT TOWARD WELL-BEING THAT NEED STRESS AND DIFFICULTIES, MAY FACE REVOLUTION TIMING OF DIVERSE COEXISTENCE AND CO-PROSPERITY WITH DX.** Mamiko KOSHIBA, Yamaguchi University, Saitama Medical University, Tohoku University (Japan)



18:30-19.00 DAY 2 CONFERENCE REFLECTION AND DISCUSSION WITH DRINKS

Satellite Day 3 ISBS Meeting. Monday, September 5, 2022

Offline at Yamaguchi University, Tokiwa Campus, Ube, Japan

09.00-14.00 VISIT TO YAMAGUCHI UNIVERSITY. COLLABORATION DISCUSSION. UBE CITY AND YAMAGUCHI PREFECTURE VISIT AND DISCUSSION FOR NEXT ISBS REGIONAL MEETING JAPAN FOR VISITING PARTICIPANTS.



Abstracts

Day 1. Saturday, September 3, 2022

ONLINE, zoom URL (Yamaguchi University, Tokiwa Campus, Ube, Japan)

Morning session

09.00-11.10 SYMPOSIUM 1. EDUCATION 1. Chair: Yoshiki MIZUKAMI (Japan)

09.00-09.20 EFFECTS OF COMPREHENSIVE LEARNING AT UNESCO ASSOCIATED SCHOOLS, ETC. Takahiro NAKAGUCHI, Shibaura Institute of Technology (Japan)

The purpose of this study is to developing absolute evaluation that effective in measuring learning effects. Relative evaluation scales and Absolute evaluation scales have been developed and surveyed in elementary school, junior high schools and Web survey.

Relative evaluation were investigated by questionnaire to students in 7 aspects of Inquisitiveness, Thinking, Judgement, Expression, Listening, Collaborativity, Executivity and Social participation. 3 results are got :1)Overall, listening skills and cooperation skills are high, and practical skills are low. 2)Some items are higher in elementary school than in junior high school 3)UNESCO schools are not always high score.

On the other hand, absolute evaluation were evaluated in 5 aspects of Inquisitiveness, Thinking, Judgement, Expression, Executivity and Social participation.

Thinking ability results: 1)There are more schools that are higher than high school and college students in the web survey. 2)As a whole, "Looking at textbooks and materials distributed at school" and "Looking up in newspapers, TV, and the Internet" were high. 3)"Visit the site and participate in events" is low, etc.

Judgement ability results: 1)There are more schools that are higher than high school and college students in the web survey 2)70% to 80% of respondents search through newspapers, TV, or the Internet. 3)"Ask adults who are working" and "Ask directly with people who are having trouble living" are low -- That is the reason to low self-evaluation of Executiveness ability etc.

Expression ability results: 1)There are Large disparities between schools 2) "Create and explain graphs using spreadsheet software such as EXCEL" and "publish on the Internet so that anyone can see" are low. etc.

Conclusions is following: 1)It is difficult to use relative evaluation (self-evaluation) as a measure of learning effectiveness 2)As getting older, your self-efficacy declines and counteracts its effects. 3)On the other hand, the absolute evaluation yields generally reasonable .

09.20-09.40 A NEW CHALLENGE OF STUDYING ABROAD – INTRODUCTION OF VIRTUAL REALITY ENGLISH LESSON. Chisa YAMADA¹, David READ², Nami ASAKAWA¹, Hiroto MORI¹, Masanori WATANABE¹, Masato MIKAMI¹, [1] Yamaguchi University (Japan), [2] The University of Sheffield.

Learning English through Virtual Reality (VR) provides students with confidence when they speak because they can choose avatars to assume a different physical form. In addition, VR technology allows for more practical lessons compared to traditional live online lessons because it can situate students in authentic contexts. For these reasons, VR English Lessons offered a more engaging opportunity for motivated study abroad students during COVID-19. For two years they had been unable to travel to learn English abroad in social situations, yet VR offered them the opportunity to

engage with each other and a tutor in a variety of natural and authentic contexts to practise the language, such as cafes, bars, airports and restaurants. VR may also help engage students who lack the interest to study English abroad, or provide opportunities for students who are limited physically or financially from travelling. Furthermore, VR can function as an effective orientation tool before students' departure to study abroad as they can experience aspects of life in their host country through 360 photo and video. This can help reduce the psychological stress they might experience when travelling to a new country. This paper will propose the future possibilities and prospects for English learning through the use of VR technology.

09.40-10.10 ENGLISH LEARNING SYSTEM FOR REDUCING LEARNERS' STRESS. Yoshiki MIZUKAMI, Yoshiyasu MATSUNAGA, Kazuaki NEKODA, Atsushi NOMURA, Yamaguchi University (Japan)

According to the EF EPI 2021, not only is Japan's English level 78th out of 112 countries, but it is also on a downtrend. In today's globalized world, learning another language is becoming more and more essential, but it is a high-stress experience for many people. Therefore, in this study, we designed and developed an English learning system based on motivation theory and gamification to reduce stress in learning English.

There have been active attempts in recent years to explain why many young people are enthusiastic about network games based on motivation theory. Motivation refers to the internal factors that inspire, direct, and integrate human behavior. Maslow's five-stage needs theory is one of the most well-known motivation theories. According to his theory, people fulfill their needs in the following order: physiological, safety-security, social, esteem, and self-actualization. Here, we focus on the relationship between motivation theory and network games. The observation that most users of network games belong to a community in the virtual space, that they satisfy their esteem by attracting the attention of others, and that they achieve self-actualization by working on tasks and their own goals are strongly related to the latter three stages of the five-stage needs theory. Needless to say, the key to game design is how to motivate users. Based on the similarities between motivation theory and game design, the adoption of game design concepts to effectively motivate learners has recently been termed gamification.

Traditionally, English education in Japan has focused on reading and writing, and many students have difficulty in listening and speaking. The proposed system employs a dictation style to improve listening skills. Furthermore, it provides a community of learners based on motivation theory and gamification. We conducted a subject experiment and a questionnaire to investigate the effectiveness of the system in improving English ability and user comments.

10.10-12.15 SYMPOSIUM 2. PEDIATRICS. (ABUSE, COVID-19, COMPRESSION, SURVEY)

Chair: Mamiko KOSHIBA (Japan)

10.10-10.30 A PARENTAL ABUSE AND INTERVENTION CASE IN COMMON MARMOSET MODEL. Mayuko YODA¹⁻², Hideo YAMANOUCI², Yoshimasa KAMEI², Mamiko KOSHIBA¹⁻³, [1] Yamaguchi University, [2] Saitama Medical University, [3] Tohoku University (Japan).

When a newborn appears some developmental problems, such as premature birth, it is necessary to separate the infant from the mother to allow for proper nutritional management of the newborn. Supportive intervention for mothers are needed to establish breastfeeding as well as the recovery of the newborn. Fathers also need to appropriately support their breastfeeding. In our primate model, common marmoset colony, we met a case which a newborn infant was underweight because the father exhibited interfering behavior to breastfeeding. To solve this problem, we explored intervention techniques, firstly to let the infant recover and to promote mother-infant

mutual interaction from both sides. The series of both-way intervention for an infant and a mother may suggest educational benefit to support attachment formation during a sensitively perinatal period.

10.30-11.00 EPIGENETIC MODIFICATIONS REGULATING PROSOCIALITY AND ITS INFLUENCE OF CHILD MALTREATMENT. Shota NISHITANI, Akemi TOMODA, University of Fukui (Japan).

There is growing evidence that a hormone/neurotransmitter, oxytocin (OXT), plays a crucial role in regulating prosociality in humans, including empathy/cooperative behaviors and social bonding, such as attachment formation between children and their parents and romantic-relationship. However, little is known about how epigenetic modifications modulate these social behaviors and their brain structures/functions in humans. DNA methylation, one of the most studied epigenetic modifications, plays an essential role in regulating gene expression and, therefore, a broad range of biological processes and diseases. This talk introduces our recent research progress in the role of the OXT gene and its receptor (OXTR) gene methylation in various social behaviors and related brain functions in humans. We investigated whether DNA methylation in the OXT and OXTR genes modulates 1) empathy/cooperative behaviors and their related brain structures/functions, 2) personality traits, and 3) drug addictive behaviors and romantic-relationships support in young adulthood. Also, we studied 4) how early childhood extreme adverse experiences such as child maltreatment alter the OXT and OXTR gene methylation in institutionalized children separated from their biological parents compared to control children and its influence on the atypical brain structural differences. These studies have demonstrated that the promoters of the OXT and OXTR genes contribute to modifying human social behavior and its brain structure and function, and this was influenced by early childhood experiences such as child maltreatment.

11.00-11.20 A QUALITATIVE STUDY OF NURSES' SPEAKING APPROACH TO UPSET PARENTS IN NICU UNDER COVID-19 VISITING RESTRICTIONS. Yumika BABA, Toshiro MATSUBARA, Mayo YOSHIGA, Hitomi MITSUI, Tamami NAKAMURA, Yuko FUJII, Naoko HIGUCHI, Rieko YOSHIHARA, Shin NAKAGAWA, Yamaguchi University (Japan).

As the mental care team activity in COVID-19 disaster, the presenter's regular visits to the NICU have been repeated since April 2020. In this report, we introduce our macroscopic reflection by questionnaire backward survey in the NICU nurses' collaboration. The qualitative analyses revealed difficulties in the parents restricted their visits and some nurses' successful cares. The discussion may suggest next caring approaches to psychological vulnerabilities which NICU generally encompasses in the prolonged COVID-19 disaster.

11.20-11.40 INVESTIGATION OF THE EFFECT OF COMPRESSION STRESS INDUCED DEFORMATION ON THE BLOOD FLOW IN ANTERIOR SPINAL ARTERY. Weiyue CHEN, Fei JIANG, Xian CHEN, Yamaguchi University (Japan).

11.40-12.10 IMPLEMENTATION OF A WEB-BASED STRESS CHECK SYSTEM FOR CHILDREN TO PROMOTE MENTAL HEALTH. Miyuki FURUKAWA, Ayako TSUCHIYA, Seiichiro HORI, Eiji SHIMIZU, Research Center for Child Mental Development, Chiba University (Japan).

The number of suicides among children under the age of 18 in FY2020 in Japan was 499, a 40% increase compared to the previous year, and the top three causes were worries about career paths, poor academic performance, and discord between parents and children (MEXT 2022).

In FY2021, under the GIGA School concept promoted by the MEXT, students began learning using a computer one by one.

Therefore, we studied the implementation of a stress check system for children on the Web, which is intended for high school students to understand children's stress using the Web, to grasp the degree of stress and psychological burden in the children, and to provide appropriate feedback.

As a result, we found that conducted web-based stress checks three times a year, with a stress response of 30 points used as the cutoff value. In schools, the system was able to detect 12.8% to 14.1% of high-stress students, which served as material for educational consultation. The feedback sheet allowed students to know their own stress status.

It is hoped that the system will help prevent mental illness among students and improve their mental health.

Afternoon session

12.40-14.00 SYMPOSIUM 3. MEDICAL BIOLOGY. (RESPIRATORY, BRAIN)

Chairs: NISHITANI (Japan)

12.40-13.00 EXPLORING RELATIONSHIP BETWEEN MUSCLE CONTRACTION AND RESPIRATORY FUNCTION: DYNAMIC ANALYSIS OF THE DIAPHRAGM MUSCLE CONTRACTION. Chenyang LIANG、 Fei JIANG、 Xian CHEN, Yamaguchi University (Japan)

13.00-13.30 SUSCEPTIBILITY-WEIGHTED IMAGING (SWI) IN NEONATES WITH INTRACRANIAL HEMORRHAGE. Hiroko KAKEI¹, Hayato SAKURAI¹, Mamiko KOSHIBA¹⁻³, Testuya KUNIKATA¹, Hideo YAMANOUCI¹, [1] Saitama Medical University, [2] Yamaguchi University, [3] Tohoku University (Japan)

Susceptibility-Weighted Imaging (SWI) is a MR calculation technique to produce an enhanced contrast magnitude image which is very sensitive to venous blood, hemorrhage and iron storage. SWI has been reported to provide clinically useful information that is often complementary to conventional MR imaging sequences used in the evaluation of various neurologic disorders, including traumatic brain injury, cerebral infarction, neoplasms, and neurodegenerative disorders associated with intracranial iron deposition or calcification. To find intracranial hemorrhage during neonatal periods, we frequently use SWI to diagnose children admitted in our NICU. This report is about the study aimed to find any relevant comorbidities to SWI positive infants retrospectively.

13.30-14.00 MATCHING THE RIPLE-WAVE TO THE EPISODIC MEMORY-A CASE STUDY OF RAT. Takashi KUREMOTO¹, Junko ISHIKAWA², Takaaki SASAKI², Shingo MABU², Dai MITSUSHIMA², [1] Nippon Institute of Technology, [2] Yamaguchi University (Japan).

Hippocampus in the brain makes an important role in the formation of memories. However, it is not clear the different episode memories concern with what kind of activity pattern of hippocampus. In this study, the multi-unit activity (MUA) of hippocampus CA1 neurons in male rats experiencing one of 4 kinds of events was analyzed by a deep learning method. The events may occur episode

memories included restraint stress, contact with a female rat, contact with a male rat, and contact with a novel object. The deep learning method is a hybrid machine learning model composed by a convolutional neural network (CNN) and support vector machine (SVM). Four kinds of episodic memories including restraint stress, contact with a female rat, contact with a male rat, and contact with a novel object. Details of MUA recording are described in “A possible coding for experience: ripple-like events and synaptic diversity” by Ishikawa, Tomokage, and Mitsushima (doi: <https://doi.org/10.1101/2019.12.30.891259>). The event-related sharp waves and ripples were recognized with 89.45% accuracy in the experiment. Additionally, by the extraction of feature of ripple signals using Grad-CAM and classification of those patterns using Principal Component Analysis (PCA), the difference of the MUA concerning to 4 kinds of episode memories was shown.

14.00-16.30 SYMPOSIUM 4. CHILD DEVELOPMENT. (DISABILITIES, INTERVENTION)
Chairs: Mamiko KOSHIBA (Japan)

14.00-14.20 AI TO EXTRACT SKELETONS IMPLIED EDUCATIONAL EFFECTS OF A SWINGSET GENERATED BY NATURAL MATERIALS, FOR CHILDREN'S SOCIALIZATION AND INDEPENDENCE ESTABLISHMENT

Fusako TOMOTO¹, Kosuke IWASHIRO¹, Makoto OTA¹, Yoshiki MIZUKAMI¹, Masanori HARIYAMA³, Mamiko KOSHIBA¹⁻³, [1] Yamaguchi University, [2] Saitama Medical University, [3] Tohoku University (Japan)

Children are encouraged to play in groups for socio-psychological development. The educational effect has long been obvious, however, the quantitative evidence has been less reported or its supporting technologies are not fully available. As the solution to these issues, we focused on a swingset temporally generated by natural materials, tree branches, pulley and ropes made by students and citizens at a regional kid's playground, which had a unique function to lead their cooperation behavior spontaneously. And we attempted to explore any functional evidence in the children's voluntary motion to investigate two approaches about group size and influence of adult coexistence. Their 25-body-joint motion data were obtained by skeletons AI, Openpose (Yaser Sheikh) with depth consideration and were analyzed depending on the number of people in the group. In result, the group without adults showed a group-size-dependent behavioral activation while this tendency seemed suppressed in the group with adults. The most highly correlated joint of children without adults was suggested right ear, which might be hypothetically discussed about brain asymmetry in socio-psychological cognition.

14.20-14.40 A TRAINING APPLICATION TO LEARN SOCIO-ENVIRONMENTAL ADAPTATION USING A TABLET WITH A BIOMETRIC SENSOR FOR CHILDREN WITH DEVELOPMENTAL DISABILITIES. Kenji ITO¹, Mamiko KOSHIBA¹⁻³, [1] Yamaguchi University, [2] Saitama Medical University, [3] Tohoku University (Japan)

In recent years, anticipation for novel IT materials to educate children's communication and social motivation has been getting higher.

A certain symptom in children indicates a disorder of cross-modal development in which sensory, motor, emotional functions and integrated in a well-balanced manner. For approach to this issue, new IT tools have emerged that can lead childrens cultivate complex neural functions. We are developing a socially acclimatized education system that allows children to interact with each other by greeting, introducing themselves, and conversing with virtual friend avatars and animations. The application is aimed to determine what they are interested in and what kind of situations and environments they can develop complex functions while maintaining fun and motivation. The ultimate goal of this system is to find each tailor-made supporting programs to establish unique personality and adapt own to the social life in an optimal way for the individual.

14.40-15.40 KEYNOTE LECTURE 1. NEURODEVELOPMENTAL DISORDERS IN CHILDREN. Makiko KAGA, Tokyo Metropolitan Tobu Medical Center for Children with Developmental Disabilities, National Center of Neurology and Psychiatry (Japan)

15.40-16.00 AN EXTREMELY NEURONAL LEARNING SYSTEM OF MOTOR AND PSYCHO-COGNITIVE FUNCTIONS BRIDGING BETWEEN REALITY AND VIRTUAL REALITY ON HIGHLY TIGHT WALKING WITH ASSISTIVE APPARATUS, Nao MIYOSHI, Poser Co, Yamaguchi University (Japan)

The vestibular system and other multifunctional neural balance centers may be candidates of crucial trigger factors for motor, sensory, emotional and cognitive development. In recent human life, however, the environment is getting less conducive to the vestibular system development, implying a relationship with the increase in neuronal vulnerability symptoms. To open novel approaches to some neuronal difficulties, we introduce extreme high risk conditions of climbing to great heights without a lifeline may lead to miraculous neural circuit formation through this unusual and novel experience. We have furthermore improved the system to rehabilitation training for patients with neurological disorders utilizing Virtual Reality technologies (VR) of 3D spacio-cognitive with real support structures without real fall risks. The system clinical evaluation has resulted in functional recovery in patients with various stages of handicaps. The development of spatial recognition has suggested potentials to function brain fundamental network core.

16.00-16.30 A JUVENILE POLY I:C RAT MODEL FOR AUTISM: MATERNAL IMMUNE ACTIVATION, NEUROINFLAMMATION AND EPIGENETIC MODULATION. Chao DENG, School of Medical, Indigenous and Health Sciences, University of Wollongong; Antipsychotic Research Laboratory, Illawarra Health and Medical Research Institute, Wollongong, NSW (Australia)

Maternal immune activation induced by bacterial or viral infection is associated with psychiatric disorders, including autism and schizophrenia, in the offspring. Exposure to polyribinosinic-polyribocytidylic acid (Poly I:C) in pregnant rats has been reported to cause schizophrenia-like behaviours and abnormal neurotransmissions in adult, particularly male, offspring. However, what is less well understood are the effects of maternal Poly I:C exposure on adolescent behaviours and neurotransmission in female juvenile rats. A juvenile Poly I:C model was constructed by treating with 5 mg/kg Poly I:C on timed pregnant rats at gestation day 15. Prenatal Poly I:C exposure led to elevated anxiety-like and depression-like behaviors in female adolescent offspring. Deficits in pre-pulse inhibition and social interaction were also observed. However, the Poly I:C rats had better performance than the controls in the novel object recognition memory test which might demonstrate a potential behavioral phenotype of autistic savant. Prenatal Poly I:C exposure caused brain region-specific alterations in neurotransmissions and an elevation of NF- κ B-NLRP3-IL-1 β inflammatory signalling in female juvenile rats. Epigenetic histone acetylation contributes to NF- κ B/NLRP3 mediated neuroinflammation deficiency induced by prenatal Poly I:C exposure.

16.30-18.40 SYMPOSIUM 5. EDUCATION 2.
Chairs: Luke SANTAMARIA (New Zealand)

16.30-17.00 TOUCHSCREEN TABLET USE AND NON-USE IN NEW ZEALAND'S EARLY CHILDHOOD: REPORTS FROM A MIXED METHOD PHD STUDY. Luke SNTAMARIA, Alumnus of Victoria University of Wellington (New Zealand).

Despite ongoing debate on young children's Information Communication Technology (ICT) use in early childhood education (ECE) (Fleer, 2013), evidence on how these devices are shaping our children's futures (i.e., Fleer, 2017; Kucirkova & Sakr, 2016; Sakr, 2018) abound. This paper builds on scant prior evidence on touchscreen tablets use and non-use amongst four ECE service types in New Zealand: education and care, kindergarten, home-based and playcentre via a national survey and a collective case study which included the use of video recordings to stimulate teachers/educators' recall of their touchscreen tablet use (Gass & Mackey, 2000; Henderson & Tallman, 2006).

This paper reports on finding from a PhD study that examined the extent of touchscreen tablet use according to service type, their reasons for services' use and non-use, how teachers/educators use touchscreen tablets to support children's learning and their reported barriers and affordances in ECE pedagogy. Furthermore, the results showed that teachers'/educators' touchscreen tablet use aligns with Te Whāriki, New Zealand's early childhood education curriculum (Ministry of Education, 2017), particularly in the communication and exploration strands. This study adds to the understanding that touchscreen tablet use is not necessarily limited to a dichotomy of use and non-use but is spread across a spectrum ranging from limited to specialised to comprehensive.

17.00-17.20 CHILDREN'S SUMMAR SOCIALIZATION IN WATER SLIDES ALONG THE EXISTING SLOPES. Zhudi HUA¹, Ting TAO¹, Risa AKITA¹, Tomofusa AKITA¹, Masanori HARIYAMA³, Hayato SAKURAI², Mamiko KOSHIBA¹⁻³. [1] Yamaguchi University, [2] Saitama Medical University, [3] Tohoku University (Japan)

Children's play is thought as their learning behaviors for socialization. The play learning is affected by environmental structures on humans cooperation and creation on the own plays. In this research, we temporarily designed and set four types of water slides in different city parks and reflected each featuring of children participants mutually compared in the recorded video data. The water slides were installed using slopes and stairs originally provided in the park and school.. In the expand of ground, a slide was built by constructing structures at the center of the flat ground. In comparison of the four water slides, any types could be fully used by many children with their mutually playing there. Interestingly, the fastest sliding children could be seen their serially sliding at the narrow width of slides, whereas the other water slides involved more diversified and slow interactive plays. These differences on the children's social interaction were implied the importance of both designs, tool structures and environmental consideration.

17.20-18.40 VIDEO "OF CHILCKS AND BABIES. HOW TO BUILD A SOCIAL BRAIN BASED ON ANIMACY DETECTORS" WITH POST-DISCUSSION. Giorgio VALLORTIGARA, University of Trento (Italy)



Day 2. Sunday, September 4, 2022

ONLINE, zoom URL (Yamaguchi University, Tokiwa Campus, Ube, Japan)

Morning session

09.00-10.00 **SYMPOSIUM 6. BODY PHYSICS.** Chairs: Tsuyoshi MORIYAMA (Japan)

09.00-09.20 **BODY PHYSICS CONSIDERATION IN BONES OF A BOTTLENOSE DOLPHIN WITH 3D SCANNING AND PRINTING FOR ROBOT SIMULATION OF THE SWIMMING DYNAMICS.** Koji OKUTO¹, Masaaki IKEDA², Fumitake FUJII¹, Mamiko KOSHIBA¹, Takashi SAITO¹, [1] Yamaguchi University, [2] National Institute of Technology, Tokuyama College (Japan)

Psychological function can be inferred by physical and physiological signals. Approaches by PC and robotic simulations of physical function must be important for any psychological studies. Dolphins are mammals that share many similarities with humans, such as vocal social communication and tool use. This mammal is known about special contribution for developmental disabilities treatment. Thus, we are going to introduce our preliminary study of dolphin's virtual and real structure simulating with 3D CAD and printer copies of a set of bones from a Bottlenose dolphin (*Tursiops truncatus*).

09.20-09.40 **A STUDY ON VISUALIZATION OF "ACTIVITY VOLUME" ABOUT PLAYERS IN VOLLEYBALL.** Makoto OTA¹, Kosuke IWASHIRO¹, Fusako TOMOTO¹, Mamiko KOSHIBA^{1,2,3}, [1] Yamaguchi University, [2] Saitama Medical University, [3] Tohoku University (Japan)

Volleyball, a ball game in which players hit a ball over a net, is played by a team of six players and is a popular game at the Olympics. In this study, we evaluated the movement of the players according to their positions using "activity volume" in this evaluation of the amount of activity, "Deeap sort" was used as a visualization method. Specifically, the center of gravity was obtained from the rectangular coordinates surrounding each player, and the amount of movement was evaluated as the "amount of activity volume". The data acquisition targets were playes of a high school that is one of the strongest in the country, and the measurements were made over a period of two days in the gymnasium of the high school. The amount of activity volume varied depending on the position of the players at right or left side under these conditions. This was presumably due to the characteristics of the team's attack pattern.

09.40-10.00 **MENTAL STRESS AND SUPPORTS FOR CHILDREN IN CRISIS -CASE STUDY ON PRE-SCHOOL AND ELEMENTARY SCHOOL -** Yuko MIKI, Toe TANIMOTO, Teikyo University (Japan)

In recent years, changes in social conditions have led to an increase in mental stress among children and their families, and there is a lack of adequate support for them. This time will provide an opportunity to introduce the characteristics of and support for child mental stress from the childcare and educational settings as well as from a medical perspective, and to consider how specific support and assistance should be provided in the future.

1. Childcare field: Characteristics of mental stress in young children and actual support for them
With the prolonged spread of COVID-19 infection, certified child care centers have identified children who show developmental effects due to lack of experience and who cannot relate well to others and do not fit in with group life. In addition, the number of parents who suffered from

physical and mental isolation due to the loss of connections with people and the community through child-rearing increased. Key points of support included (1) providing a place for parents to communicate the appeal of their children's existence, (2) providing a place for parents to engage with children other than their own, and (3) promoting parents' understanding of "education through play," which is the basis of early childhood. It is significant for parents to recognize that parents become parents through their mutual interactions with their children and that children learn and grow through play.

2. Educational Field: Characteristics of mental stress among school-aged children and actual support for them

We addressed children and their families mainly from the perspective of the Great East Japan Earthquake and the spread of COVID-19. First, it is necessary for children, parents, and educators who have anxiety to share their concerns together. In providing support, we were particularly conscious of "nurturing children's relationship skills" and "broadening children's perspectives".

3. Medical Field: Relationship between Emotion and Breathing

Breathing is integrated with emotions, and negative emotions are alleviated by breathing. In fact, it was verified that respiratory muscle stretching exercises were conducted on children affected by the Great East Japan Earthquake, which stabilized their breathing and significantly reduced their anxiety levels.

In the future, it is necessary to conduct research and practice on how to create an environment that promotes "emotional education" and "interpersonal relationship development" to reduce children's mental stress, as well as on specific support..

10.00-12.40 SYMPOSIUM 7. SOCIAL COGNITION.

Chairs: Allan V KALUEFF (Japan)

10.00-10.30 COMPUTER ASSISTED ANALYSIS OF FACES AS THE STRESS INDICATOR.

Tsuyoshi MORIYAMA, Tokyo Polytechnic University (Japan)

Aggressive affections of automobile drivers such as irritation often cause unpleasant experiences and ultimately road rage. Detecting their cues from drivers' behaviors and obviating undesirable consequences is the most important role of automobile navigation for future safe driving. Facial expressions have been found to be a useful indicator of the driver's affection due to the robustness in monitoring drivers compared with other sensors. Affection consists of two kinds of factors: emotion (impulsive and strong) and mood (long lasting and subtle), where mood biases what kind of emotions to come up. Although moods dominate emotions, conventional approach in facial expression analysis has focused on emotion rather than mood in this context. The technical difficulty in detecting faces when specific mood is that there is no standard expression of mood that can be used as the stable ground for detecting changes. In other words, faces keep varying over time. The proposed method parameterizes long-term appearance changes of a face using the mutual subspace method. It picks face images over a short period of time (a window) and reduces the dimensionality of the variance to obtain the principal components (a subspace) for the window. As it repeats the process, it calculates the canonical angle (the rotation of whole subspace) between adjacent subspaces where the inverse of the cosine of the angle parameterizes the change of facial appearance over time. Different appearance of faces due to different mood gives larger values. As far as the experimental setting contains facial changes due to aggressive moods, the rotation indicates the levels of aggressive mood (e.g., irritation). In addition to mood parameterization of a car driver using face analysis, another analysis of face is introduced in this talk that visualizes the nerve activity of a person using face analysis.

10.30-10.50 DEVELOPMENT OF EDUCATIONAL AI TO ENCOURAGE CHILDREN TO PROGRAM AND CO-CREATE WORKS. Kosuke IWASHIRO¹, Ting TAO^{1,2}, Fusako TOMOTO¹, Makoto OTA¹, Zhudi HUA¹, Tomofusa AKITA¹, Michinori SUMIMOTO¹, Hiroataka FUJIMORI¹, Yumika BABA¹, Hayato SAKURAI², Masanori HARIYAMA³, Shinya SENBA⁴, Mamiko KOSHIBA^{1,3,4}, [1] Yamaguchi University, [2] Saitama Medical University, [3] Tohoku University, [4] Ube College National Institute of Technology (Japan)

In early childhood, it is important for parents and caregivers to understand children's characteristics and conduct appropriate developmental assessments, but until now, it was more qualitative, lacking objective reliability. To solve this problem, we attempted to develop a quantitative approach of child behavioral observation in an educational class to create outdoor play using microcomputer programming before going out to output play trial. Obtained behavioral video data on each child for two hours were quantitatively analyzed their joints motion using Openpose and an AI library called DeepSort, and according to qualitative discrimination, we statistically extracted features of either group of co-creativity high or low. This novel socio-creative marker in programming workshop interestingly might suggest unique space relevant dynamics.

10.50-11.50 KEYNOTE LECTURE 2. HOW DOES JUVENILE SOCIAL ISOLATION IMPACT ADULT SOCIAL BEHAVIOR? - DEVELOPMENTAL MISMATCH MODEL. Hirofumi MORISHITA, Mindich Child Health & Development Institute, Friedman Brain Institute, Icahn School of Medicine at Mount Sinai (USA)

Loneliness is becoming increasingly recognized as a threat to mental health. Juvenile social isolation (JSI) is known to disrupt social behavior in adulthood, but little is known about the neural mechanisms linking these two events. Our previous study suggests that there is a juvenile sensitive period when isolation (postnatal day 21-35) will induce medial prefrontal cortex (mPFC) abnormalities including parvalbumin positive interneurons (PVIs) in adult mice (Yamamuro et al Nature Neuroscience 2020, Bicks et al Nature Communications 2020). Of note, these circuit abnormalities were not present at the end of the isolation, raising the question of when and how JSI-induced social deficits emerge over the course of development. Here we investigated the developmental progression of JSI-induced social dysfunction (n=12-21mice). We found that JSI-induced social dysfunction in the 3-chamber test is delayed (not fully emerging until p50) and the sociability deficit, where subjects interact with novel mice, is preceded by negative social interactions between JSI cagemates during the first week after the end of isolation. A chemogenetic modulation of dmPFC-PVI activity for a 2-week adolescent period (p35-49) at the start of re-housing leads to a long-term rescue of sociability (p = 0.045) without altering anxiety or locomotor behaviors. These results suggest that the prevailing “social deprivation model”, where adult social deficits are attributed to disruption of developmental processes occurring during the isolation period, should be supplemented by the “developmental mismatch model”, where social deficits are attributed to disruption of developmental processes occurring after the isolation period. Our study also highlights a novel adolescent sensitive window to prevent the emergence of social behavioral deficits in adulthood. Acknowledgements: This study was supported by NIMH R01 MH118297.

11.50-14.00 SYMPOSIUM 8. DIGITAL MEDIA AND SUPPORT.
Chairs: Shun NAKAMURA (Japan), Hirofumi MORISHITA (USA)

11.50-12.10 VIRTUAL AND AUGMENTED REALITY WORKSHOPS FOR JUNIOR HIGH SCHOOL STUDENTS' INTERNATIONAL CULTURE EXCHANGE BETWEEN WEIHAI AND UBE CITIES. Kiryu UTANO¹, Ting TAO^{1,2}, Kosuke IWASHIRO¹, Mamiko KOSHIBA¹⁻³, [1] Yamaguchi University, [2] Saitama Medical University, [3] Tohoku University (Japan)

This project aims to deepen exchanges between Chinese and Japanese junior high school students by exchanging information about each other's region through IT technologies such as VR and AR. The Japanese group created Chokokun, the mascot character of Ube City, using 3DCG software called Blender, and produced a video in which the mascot character of Ube City appeared in real space using an AR application called Adobe Aero, and performed with junior high school students. The project also boasts a 360-degree camera to show off the local area. On August 21, 2022, an online discussion and exchange meeting was held, where junior high school students from Japan gave a presentation using these videos as explanatory materials. The Chinese side sent a 360-degree video of Weihai's tourist attractions and provided an opportunity to exchange opinions with each other. We believe that this cross-cultural exchange was an important experience for the junior high school students in eliminating preconceptions and prejudices about foreign countries. We also believe that this kind of exchange is very important for the development of global human resources in Japan, as there are few opportunities for junior high school students to be exposed to different cultures during their compulsory education in Japan.

12.10-12.40 LUNCHEON LECTURE 3. GAMING DISORDER IN JAPAN AND ASIA. Shun NAKAMURA, Tokyo University of Agriculture and Technology (Japan)

12.40-13.00 BREAK

13.00-13.20 EXPLORATION AND VERIFICATION OF EEG-TARGETED FOREHEAD REGIONS FOR NEUROFEEDBACK TO RELIEVE A STRESSOR, CHRONIC PAIN. Kazuyuki ODA¹, Nobuyoshi KOIWA², Mamiko KOSHIBA^{1,3,4}, [1]Yamaguchi University (Japan), [2]University of Human Arts and Sciences, [3]Saitama Medical University, [4]Tohoku University (Japan)

Pain is one of the most serious stressors. Pain relief is a major contributor to Quality of Life. In particular, chronic pains require psycho-social cares, and the effectiveness of neurofeedback therapy for chronic pains has been proven in plenty of previous reports. Neurofeedback therapy involves visually understanding and giving feedback to the patient's own brain waves. Since the patient's frequent performance may augment the effect, improving toward home-use is expected. The therapy requires the patient's own setting the EEG probes precisely and repeatedly over multiple days at home. For the solution, we focused on the forehead, supposedly superior to other scalp regions to place EEG probes and explored optimal places for Neurofeedback probes. We analyzed spacial correlations of the brain waves recorded at seven forehead candidate regions and compared with the ones obtained at the C4 position to find the optimal region on the forehead. We conducted sLORETA analysis using brain waves derived from 20 positions in the scalp, and compared the brain network activities during neurofeedback between the forehead sites and C4. Consequently, Neurofeedback from forehead-derived EEG appeared the similar network to C4-derived EEG, suggesting the existence of neuronal networks in SMR and Theta waves.

13.20-13.40 A REPORT ON THE CURRENT STATUS AND FUTURE POTENTIAL OF THREE RESEARCH TOPICS RELATED TO GUQIN. Shun KUREMOTO¹, Mamiko KOSHIBA¹⁻³, [1] Yamaguchi University, [2] Saitama Medical University, [3] Tohoku University (Japan)

GUQIN, as one of the oldest stringed instruments in the world, has been known and played more than 3,000 years in China. It is currently designated as a World Intangible Cultural Heritage by UNESCO. Heian and Edo periods saw a lot of famous players in Japan. There have been many studies on GUQIN from the humanities, performance techniques, school studies, history, and other humanistic perspectives. However, there are not many studies from an engineering or brain science perspective. I am studying GUQIN from the perspective of systems engineering, brain science, and psychology. First, cooperating with T.Kuremoto group from NIT(Nippon Institute of Industry), we use deep learning methods to automatically translate and restore ancient GUQIN scores, which is said to be very difficult and few of masters can do it in the world. Next, we will investigate the effects of GUQIN performance activities on the human brain, particularly with regard to stress and the autonomic nervous system. In the future, we will create a 3D model of the performance method and conduct research that will lead to the development of an automatic teaching system and automatic identification of performance levels.

13.40-14.00 LARGE SCALED DIGITAL LED AND SOUND INTEGRATIONS MIGHT ACTIVATE BRAIN WITH FUNCTIONAL COMPENSATE FOR LIMITED INFORMATION STRESS. Shinichi SAKAMOTO¹, Mamiko KOSHIBA¹⁻³, [1] Yamaguchi University, [2] Saitama Medical University, [3] Tohoku University (Japan)

As an illumination event (holiday light show) during the Christmas season, a large scale of addressable LED pixels was mounted on the walls of the building and synchronized with music by means of lightshow sequence software. Unlike projection mapping in entertainment shows (where images are cut along the ridgelines of the building to create the illusion that the building morphing), this show was staged with the intent of incorporating rough "image-like" objects that never become images, and many visitors came throughout the season to see the show. In result, many visitors came during the season to see the show through SNS comments. This show is not to send a large amount of information to the perceiver like a video, however rather to send summarized information, which gives the perceiver's brain the stress of "imagining a scene," which can then be arranged according to the past knowledge and experience of each perceiver and become his/her own understanding. This suggested that when two different types of information, one was visual information and the other was music (auditory information) reached the perceiver, the perceiver actively tried to understand the scene by putting stress on himself/herself.

Afternoon session

14.00-15.30 SYMPOSIUM 9. ENERGY.
Chair: Shun NAKAMURA (Japan)

14.00-15.00 KEYNOTE LECTURE 4. INSIGHTS OBTAINED FROM EXERGY RESEARCH ON BUILT ENVIRONMENT THAT COULD AFFECT THE HUMAN STRESS AND BEHAVIOR. Masanori SHUKUYA, Tokyo City University (Japan)

A better understanding of built-environmental control systems such as lighting, heating, cooling, and ventilation, all of which can work with energy supplies from the grids or from the

nearby sources to be found in the immediate natural environment, is crucially important in order to seek the sustainable human societies locally and globally looking into the future.

The built-environmental control systems are to be designed, constructed, and operated in order to provide the building occupants with safe, healthy, and comfortable space for their variety of activities. Their importance comes from the fact that we human being spend more than 90% of 24 hours a day, which is equivalent to 90 years in one's life span assuming 100 years.

Research on those systems together with physio-psychological nature of human beings as building occupants from the view point of exergy, which is derived by combining the energy conservation law, the entropy generation law together with the environmental temperature, has advanced quite a lot over the last thirty years or so.

In this talk, why the exergy concept is necessary is briefly introduced in a manner for non-professionals and then what has been so far clarified from the research activities pursuing a better understanding of the thermodynamic nature within the heating, cooling, and other systems together with human physio-psychological nature from the thermodynamic viewpoint. I hope that the findings to be presented would be worthwhile for those, in particular young researchers, involved in human stress and behavior.

15.00-15.30 SUPPLY OF GREEN ELECTRICITY THROUGH THE LIVING PLANTS MICROBIAL FUEL CELLS (PMFCS). Azizul MOQSUD, Yamaguchi University (Japan)

Microbial Fuel Cell (MFC) is a bio-electrochemical device which is used to generate bioelectricity from various organic substances. It is a novel technology to generate the green energy (electricity) from the metabolic activities of the bacteria. Some MFCs are used to treat the wastewater, some MFCs are used for the bioremediation of the contaminated soil and the sediments. However, when the MFC is used with the help of the living plants to generate bioelectricity, then it is called plant microbial fuel cell (PMFC). In this study, various living plants were used to generate bioelectricity. It was found that the bioelectricity can be generated from both aquatic plants and non-aquatic plants in the nature. However, aquatic plants showed the less fluctuation of voltage generation. Plant microbial fuel cell could be the future of the green electricity supply for the smart city as well as off-grid rural areas.

15.30-18.30 SYMPOSIUM 10. HUMAN AND MODEL.
Chair: Shun NAKAMURA (Japan)

15.30-16.30 PLENARY LECTURE: ZEBRAFISH, BRAIN AND BEHAVIOR, Allan V Kalueff, Saint Petersburg State University (Russia)

Zebrafish (*Danio rerio*) are rapidly becoming a popular model organism for neuroscience research and modeling CNS disorders. This lecture will provide a historical perspective on using zebrafish in neuroscience, and will offer an updated outline for modern emerging topics in translational studies of the brain, behavior.

16.30-16.50 QUANTITATIVE EVALUATION OF GLIAL CELLS UNDER HYPOXIC-ISCHEMIC STRESS USING THE COMMON MARMOSET NEONATAL MODEL. Ting TAO^{1,2}, Rie SUGE², Hideo YAMANOUCI², Yoshimasa KAMEI², Mamiko KOSHIBA^{1,3}, [1] Yamaguchi University, [2] Saitama Medical University, [3] Tohoku University (Japan)

Perinatal mothers' mental and physical stress load leads to low birth weight infants and premature births. It was reported that these births cause hypoxia, ischemia, inflammation and periventricular leukomalacia (PVL) associated with the underdevelopment of oligodendrocyte cells. It may progress to neurodevelopmental disorders such as cerebral palsy and cognitive/behavioral disorders. In this study, common marmoset neonates were exposed to hypoxia (4 animals) and constant air exposure (3 animals under the control condition) on the day of birth. The obtained brain slices were immunostained against oligodendrocyte progenitor cell marker protein PDGFR α (platelet-derived growth factor receptor α), microglial cell marker protein Iba1 (Ionized calcium-binding adapter molecule 1), and mature oligodendrocyte cell marker protein Olig2 (Oligodendrocyte transcription factor), were performed on the brain sections collected during the day. Each marker protein, PDGFR α , Iba1 and Olig2 was found to be stained by microscopic imaging, and quantitative / comparative analysis was performed to explore quantitative indices of periventricular neurological cells in the hypoxia-exposed group.

16.50-17.20 TARGETING COMMON INTER-SPECIES GENE EXPRESSION PATTERNS IN RNA-SEQUENCING DATA OF AFFECTIVE DISORDERS. Demin KA, Krotova NA, Ilyin NP, Galstyan DS, Kalueff AV, Institute of Experimental Medicine, Almazov National Medical Research Centre; Institute of Translational Biomedicine, St. Petersburg State University, St. Petersburg; ZENEREI Research Center, Slidell, LA, USA; Russian Research Center of Radiology and Surgical Technologies, Ministry of Health, St. Petersburg, Russia; Ural Federal University, Ekaterinburg, Sirius University, Sochi (Russia)

Depression and other stress-related affective disorders are debilitating CNS pathologies with recurrent nature and poor treatment outcomes in clinical practice. Although animal models are widely used to study affective disorders pathogenesis, the results of such studies remain hard to translate into valuable clinical outcomes. Here we have attempted to utilize cross-species analysis to identify potentially evolutionally conserved patterns of gene expression in affective disorders pathogenesis. Briefly, we compared our own RNA-seq brain data of chronically stressed rats and zebrafish as well as publicly available human transcriptomic data for patients with major depressive disorder with healthy controls. Using this data, some commonly used approaches of gene expression analysis, such as differential gene expression, gene set enrichment, and protein-protein interaction networks analyses in combination with different tools for data pooling we successfully identified several key brain proteins (GRIA1, DLG1, CDH1, THRB, PLCG2, NGEF, IKZF1, and FEZF2) as a promising affective biomarkers, as well as proposed novel gene set that may be useful to study affective phenotypes in various species. Overall, the used approaches may advance translational omics studies in the biomedical field and neuroscience, as well as call for further development of such tools. Acknowledgments: This work was supported by the Ministry of Science and Higher Education of the Russian Federation (Agreement No. 075-15-2020-901)

17.20-18.00 DISCRIMINATING SIMPLE SNORING AND APNEIC SNORING FOR SLEEP QUALITY EVALUATION. Lurui WANG, Zhongwei JIANG, Yamaguchi University (Japan)

Sleep quality is the measurement of how restful and restorative the sleep process proceeds. More than 80 sleep disorders are known to affect sleep quality. Among all these factors that cause poor sleep quality, Sleep-Related Breathing Disorders(SRBD) is the second one of all sleep-related disorders(the first one is insomnia). SRBD is the condition of abnormal and difficult respiration during sleep, which has effects on the balance of oxygen and carbon dioxide in the blood. Obstructive Sleep Apnea(OSA) is the most common SRBD, it causes respiration stops and starts

repeatedly, and may lead to daytime fatigue, cardiovascular disease, or even death. Polysomnography(PSG) is the golden standard for measuring sleep quality or SRBD. However, PSG is expensive and requires a specialized operation. Therefore, there is a need for a non-intrusive, easy operating method that can be used in a home environment for OSA monitoring.

The acoustic method is getting popular in sleep monitoring as it only involves acquiring and processing respiratory sound signals. Snoring is often accompanied by OSA. Snoring occurs when the upper airway collapse, air moves around floppy tissue near the back of the throat and causes that tissue to vibrate. Simple snoring(also called Benign Snoring) occurs when there is a partial collapse of the soft tissues. Apneic Snoring (also called Obstructive Sleep Apnea related snoring) is caused by partial or complete obstruction of the airway, resulting in little or no oxygen going to the blood. For the apneic snoring, at the end of the obstruction, the closed upper airway is suddenly opened, and the pressures of the upper and lower airflows are suddenly balanced, causing the upper airway to repeat multiple openings and closings in a short period, producing a popping sound, the collapse degree and resistance of the upper airway may vary greatly from the beginning to the end of inspiration, thus affecting the vibration of the upper airway tissue. The snoring sounds in patients with OSA and with simple snoring have different characteristics and effects on breath quality. Simple snoring is generally not considered a health threat while apneic snoring is a threat to health. It is essential to discriminate between these two different types of snoring for evaluating their influence on sleep quality.

The respiratory sound is used to discriminate these two types of snoring for the evaluation of sleep quality in this study. First, the respiratory sounds are filtered and segmented into clips by Characteristic Wave. Second, Mel-scale Frequency Cepstral Coefficients(MFCC) are extracted as the feature vector for each clip. All clips are clustered into the normal breathing/snoring/uncertain categories with Agglomerative Hierarchical Clustering (AHC). Third, the snoring clips are classified into simple snoring and apneic snoring with the K-means algorithm based on formant parameters and snoring duration. Finally, sleep quality is evaluated by the apneic snoring severity. Formant frequencies represent resonance frequencies of the airways and change with the upper airway anatomy. A formant is the broad spectral maximum produced by an acoustic resonance of the human vocal tract. The linear predictive analysis (LPC) method is one of the fast and more effective formant frequency estimation methods. The sound signals were windowed with a Hamming window of 20ms with 50% overlap. In each window, a 14th-order LPC analysis is performed, and the LPC parameters were calculated via the Yule-Walker autoregressive method with the Levinson-Drubin recursive procedure. The standard deviation of F1 frequencies and duration of each snoring clip are extracted to form a 2-dimensional feature vector. All snoring clips are clustered into simple snoring/apneic snoring by the K-means algorithm. The duration of OSA is calculated as the parameter for evaluating sleep quality.

The experiments are carried out on the PSG-Audio dataset. The dataset comprises 212 PSG data along with synchronized tracheal sound. Results show that the proposed method can discriminate between simple snoring and apneic snoring with high accuracy.

18.00-18.30 LIFELONG DEVELOPMENT TOWARD WELL-BEING THAT NEED STRESS AND DIFFICULTIES, MAY FACE REVOLUTION TIMING OF DIVERSE COEXISTENCE AND CO-PROSPERITY WITH DX. Mamiko KOSHIBA, Yamaguchi University, Saitama Medical University, Tohoku University (Japan)

Human beings might learn, develop and evolve by one's finding some issues, trying to solve them, reflecting the process and planning the solution, repeatedly. If the issue is defined as stress for human to meet difficulties and challenge solutions, the stress can be thought an essential factor in the human living environment. Considering human evolution, our life technological stage seems to be warning us to reconsider the previous one-way approach to make any stress away from our lives. If we manage diversification and movable balancing smartly, it may potentially work for a major evolution shift. To co-exist and co-prosper both digital information extracted for human

convenience and environments involving the essential stress and difficulty may be one of the strategy for our well-being evolution. I introduce examples of our educational challenging to encourage engineering students self-initiative co-creation confronting full of actual complex stress in the real world and their finding issues and the solution outputs with diversified cooperators in various generations and fields.

IN MEMORIAM: PROFESSOR MITSUHIRO YOSHIOKA (1958-2021)

Last year, 2021, we lost a great leader of ISBS members, an ISBS Fellow, Prof. Mitsuhiro Yoshioka from the Department of Neuropharmacology, Faculty of Medicine and Graduate School of Medicine, Hokkaido University. His accumulated history was filled with research on stress and behavior to study how they contribute to the human evolution. The legacy he left will be remembered fondly, and will continue to remind us about the importance of studying stress and behaviors for next generations. We acknowledge all for participation in this interdisciplinary presentation and discussion meeting, ISBS Neuroscience and Biological Psychiatry “Stress and Behavior” Conference of the International STRESS AND BEHAVIOR Society (ISBS) 16th International Regional (Asia). We look forward to meeting you all again annually, open for all enthusiastic researches of stress, brain and behavior.

