Life Engineering Symposium 2019
PROGRAM
## Schedule

### Day 1 Aug. 23rd (Fri.)

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<td>p.m.</td>
<td><strong>Keynote lecture 1</strong></td>
<td>1B1 EEG 1</td>
<td>1C1 Sensor 1</td>
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<tr>
<td></td>
<td>Jackrit Suthakorn</td>
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<tr>
<td></td>
<td>1A1 BME, starting again</td>
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<td>from Manufacturing</td>
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<td></td>
<td>1A2 System and Model</td>
<td>1B2 EEG 2</td>
<td>1C2 Student Award session</td>
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<td><strong>Keynote lecture 2</strong></td>
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<td>S. Chumnanvej</td>
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### Day 2 Aug 24th (Sat.)

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<tr>
<td>a.m.</td>
<td>2A1 Sensor 2</td>
<td>2B1 Motor function &amp; Muscle 1</td>
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<tr>
<td></td>
<td>2A2 Neural Engineering</td>
<td>2B2 Motor function &amp; Muscle 2</td>
<td>2C1 Imaging &amp; Optic</td>
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<tr>
<td>p.m.</td>
<td><strong>Keynote lecture 3</strong></td>
<td>2B3 Sensor 3</td>
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<td></td>
<td>Jan Lauwereyns</td>
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<td>2A3 Functional NIRS</td>
<td>2B3 Sensor 3</td>
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<td></td>
<td>(OS)</td>
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<td>2A4 Bioinstrumentation</td>
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<td>for Ubiquitous Healthcare (OS)</td>
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<td>2B4 ECG</td>
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### Day 3 Aug. 25th (Sun.)

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<tr>
<td>a.m.</td>
<td>3A1 Life Engineering of the Toilet</td>
<td>3B1 Motor function &amp; Muscle 3</td>
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<td>(OS)</td>
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<tr>
<td></td>
<td>3A2 Muscle and skeletal system/Motor function (OS)</td>
<td>3B2 EEG 3</td>
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Keynote lecture 1

Day 1 12:45-13:45 Friday, August 23
Presenter  Jackrit Suthakorn
(Mahidol University)
Title  Toward Medical Robotics Industry: A New Era for Medical Treatment
Chair  Kazuki Nakajima (Toyama University)

Keynote lecture 2

Day 1 17:30-18:00 Friday, August 23
Presenter  S. Chumnanvej
(Neurosurgey Division, Surgery Department, Faculty of Medicine Ramathibodi Hospital, Mahidol University)
Title  Robot-assisted endonasal endoscopic transsphenoid surgery
Chair  Yodchanan Wongsawat (Mahidol University)
Keynote lecture 3

Day 2 13:30-14:00 Saturday, August 24
Presenter Jan Lauwereyns
(Kyushu University)
Title Perspectives from Cognitive Science on Bioethics and Biomedical Engineering
Chair Keiji Iramina (Kyushu University)

Keynote lecture 4

Day 2 18:00-18:30 Saturday, August 24
Presenter Janekrishna Kanatharana
(EECi Director and Executive Vice President of NSTDA)
Title Translational Research Opportunity in Eastern Economic Corridor of Innovation (EECi)
Chair Yodchanan Wongsawat (Mahidol University)
### General Session
Room A Day 1 Friday, August 23

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<tr>
<th>1A1</th>
<th>13:15 – 15:15</th>
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<td>OS 1:</td>
<td>BME, starting again from Manufacturing</td>
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<td>Organizer:</td>
<td>Tsuruo Matsuda (Kitakyushu University)</td>
</tr>
<tr>
<td>Chair:</td>
<td>Tsuruo Matsuda (Kitakyushu University)</td>
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</table>

1A1-1 **Challenge to sawing skill evaluation using the three-axis acceleration sensor**  
Tomohiko Igasaki¹, Koki Matsuura¹, Akito Koga¹, Kazuharu Hashitsume²  
¹Kumamoto University, Japan,  
²Shimane University, Japan

1A1-2 **Development of the non-invasive hand 3D measurement system contributing to higher brain dysfunction, and integrated control environment for pneumatic controlled glove for rehabilitation assistant.**  
Junya Kaneda¹, Satoshi Takahashi², Tsuruo Matsuda¹  
¹Kitakyushu University, Japan,  
²Ryowa Co., Ltd., Japan

1A1-3 **Research and development of force limit system using post-buckling characteristics of tape shaped shape memory alloy**  
Takumi Ishii¹, Hiroki Cho²  
¹Graduate student of the University of Kitakyushu, Japan  
²The University of Kitakyushu, Japan
1A1-4  **Effects of installed number of warp-direction alumite wire on operating characteristics of weft yarn-type shape memory actuator**  
Kohei Saka\(^1\), Naoki Ueno\(^1\), Hiroki Cho\(^2\)  
1 Graduate student of the University of Kitakyushu, Japan  
2 The University of Kitakyushu, Japan

1A1-5 **Toward the development of a sitting position training system**  
Takamichi Yotsumoto\(^1\), keiichi Hiroshige\(^1\), Atsushi Inomoto\(^1\),  
Masako, Fuchi\(^1\), Seiichiro, Takahashi\(^1\)  
1 Kyushu Nutrition Welfare University

1A1-6  **A vital sign monitoring system with heatstroke prediction sensor in overload exercise**  
Ryosuke Sakai\(^1\), Shigetoshi Nakatake\(^1\), Tsuruo Matsuda\(^1\)  
1 The University of Kitakyushu, Japan
1A2  15:30 – 17:30
General Session: System and Model
Chairs: Ken Kiyono (Kitakyushu University),
        P. Temrat (King Mongkut's University of Technology Thonburi)

1A2-1  Long-range auto- and cross-correlation analysis of non-stationary
        biosignal time series
        Akio Nakata 1, Itsuki Shiga 1, Miki Kaneko 1, Taiki Shigematsu 1
        Ken, Kiyono 1
        1 Osaka University, Japan

1A2-2  A numerical calculation of photonic crystal by employing Green’s
        function method
        Chiang Yan-Ju 1, Wu Cheng-Hsi 1
        1 Oriental Institute of Technology, Taiwan

1A2-3  Training Pill Detection Model Using Synthetic Data Generation
        C. Songsaksuppachok 1, P. Ritthipravat 1
        1 Mahidol University, Thailand

1A2-4  A Study of Two-class OSA Classification Based on Artificial Neural
        Networks
        P. Temrat 1, Y. Jiraraksopakun, A. Bhatranand, K. Wea-asae
        1 King Mongkut's University of Technology Thonburi,
        2 Prince of Songkla University

1A2-5  Automated Generation of Synthetic Time-Lapse Image Sequences
        of Living Cells
        Zaw Htet Aung 1, P. Kanchanapiboon 1, P. Ritthipravat 1
        1 Mahidol University, Thailand
Viscoelastic eyeball behavior in vertical saccadic eye movement

Takehito Hayami¹, Takashi Matsuo², Kyosuke Fukuda³,
Kazunori Shidoji⁴

1 Okayama University, Japan
2 The University of Kitakyushu, Japan
3 Fukuoka Prefectural University, Japan
4 Kyushu University, Japan
### General Session: EEG 1

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<tr>
<td>1B1-1</td>
<td><strong>Cortical Potential Propagation as Integration of Sensory Memory</strong></td>
<td>Gennosuke Tasaka¹, Takeshi Aihara¹</td>
<td>Tamagawa University, Japan</td>
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<td>1B1-2</td>
<td><strong>Brain modulation via binaural beat</strong></td>
<td>Nantawachara Jirakittayakorn¹, Yodchanan Wongsawat</td>
<td>Faculty of Dentistry, Mahidol University, Thailand</td>
</tr>
<tr>
<td>1B1-3</td>
<td><strong>An Analysis of Photic Driving EEG Evoked with Sets of Color Flashes from the Glasses Having the Luminous Function</strong></td>
<td>Tanaka Shu¹,², Hayami Takehito¹, Wongsawat Yodchanan³, Tiawongsuwan Lattika³, Yamada Kenji⁴, Ikuta Koji⁶, Iramina Keiji²</td>
<td>Okayama University, Japan, Mahidol University, Thailand, Osaka University, Japan, University of Tokyo, Japan</td>
</tr>
<tr>
<td>1B1-4</td>
<td><strong>Visual Field Defect Classification</strong></td>
<td>Parisa Wu¹, Nattadet ChinThanaThatset¹, Soontorn Oraintara¹</td>
<td>Mahidol University, Thailand</td>
</tr>
<tr>
<td>1B1-5</td>
<td><strong>The effect of the combined working memory and fm theta neurofeedback training for attention and working memory</strong></td>
<td>Hiroto Takeuchi¹, Keiji Iramina¹</td>
<td>Kyushu University, Japan</td>
</tr>
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</table>
The relationship between EEG and hormone

Watchara Sroykham\textsuperscript{1}, Yodchanan Wongsawat\textsuperscript{1}

Mahidol University, Thailand
1B2  15:30 – 17:30
General Session: EEG 1
Chairs: Tomohiko Igasaki (Kumamoto University),
       T. Angsuwatanakul (Rangsit University)

1B2-1  The effect of background music on attention at different difficulty levels of video game
Van Le Thi Cam¹, Ayumi Tahara¹, Nonthaporn Nakphu¹, Keiji Iramina¹
¹ Kyushu University, Japan

1B2-2  Feature Extraction of Fundamental EEG Activity for Developing Screening System using Wearable EEG Device
Ryo Inoue¹, Takenao Sugi¹, Yoshitaka Matsuda¹, Satoru Goto¹,
Haruhiko Nohira², Ryuzo Mase²
¹ Saga University, Japan
² Nihon Kohden Corporation, Japan

1B2-3  Analysis of Brain Activity for Preference Tasks Using EEG Signals
Thanate Angsuwatanakul¹, Wipavee Jung-in¹, Kittiya A-lad¹,
Manas Sangworasil¹
¹ Rangsit University, Thailand

1B2-4  Case Study: Autism Spectrum Disorder's Unique Brain Activity During Mental Arithmetic
Shota Hatano¹, Sho Ageno¹, Lattika Tiawongsuwan²,
Sansit Ngamrassameewong², Yodchanan Wongsawat², Keiji Iramina¹
¹ Kyushu University, Japan
² Mahidol University, Thailand

1B2-5  Impactful Empathetic Design for People with Dementia
Sittha Sukkasi¹, Sarawut Lerspalungsanti¹
¹ Design and Industry Solutions Research Team, MTEC, NSTDA
Automatic detection of spikes and periodic discharges in continuous EEGs in ICU: comparison with experts' visual inspection

Yuki Asayama¹, Takenao Sugi¹, Yositaka Matsuda¹, Satoru Goto¹,
Haruhiko Nohira², Ryozo Mase², Yuichi Kubota³,⁴

¹ Saga University, Japan
² Nihon Kohden Corporation, Japan
³ TMG Asaka Medical Center, Japan
⁴ Tokyo Women's Medical University, Japan
Room C Day 1 Friday, August 23

1C1 13:15 – 15:15
General session: Sensor 1
Chairs: Hiroyuki Kudo (Meiji University),
      Norased Nasongkla (Mahidol University)

1C1-1 Development of Estimation System for Diaper Absorption Volume Using Capacitance Change
Sota Tanaka 1, Shujiro Konno 1, Juhyon Kim 1, Kazuki Nakajima 1
1 University of Toyama, Japan

1C1-2 The reduction of burst chlorhexidine-release on coated Foley urinary catheter by biodegradable polymers: PLA and PCL
Siriwan Srisang 1, Norased Nasongkla 1
1 Mahidol University, Thailand

1C1-3 Measurement of Defecation and Urination by A Gas Sensor Placed Under The Toilet Seat
Takumi Kamimura 1, Daisuke Inoue 1, Yoshio Kanayama 1, 2, Juhyon Kim 1,
Kazuki Nakajima 1
1 University of Toyama, Japan,
2 NEC Solution Innovators, Ltd., Japan

1C1-4 Study on the Effect of Daily Activities on Salvary Uric Acid Determination
Haruna Saito 1, Yuki Ikemoto 1, Kenichi Nomura 2, Tomoya Koshi 2,
Yoshinori Horii 2, Manabu Yoshida 2, Hiroyuki Kudo 1
1 Meiji University, Japan
2 National Institute of Advanced Industrial Science and Technology, Japan

1C1-5 Boronic Acid Functionalized Guided Mode Resonance Sensor for HbA1c Detection
P Chamras Promptmas 1, Boonrasri Seeleang 1, Songpol Ongwattanakul 1,
Sakoolkan Boonruang 1, Waleed S. Mohammed 1, Romuald Jolivet 1
Comparative studies of Formulation and Preparation methods of Bovine Serum Albumin-Loaded Niosome

Norased Nasongkla¹, Komgrit Eawsakul¹

¹ Mahidol University, Thailand
1C2-1 Concurrent theta activity in intuitive understanding during an arithmetic task
Akira Okuwa¹, Arao Funase¹, Hironori Nakatani², Ichi Takumi¹
¹Nagoya Institute of Technology, Nagoya, Japan
²Tokai University, Tokyo, Japan

1C2-2 Investigation of EEG-DMN using Phase Locking Value
Sho Ageno¹, Shota Hatano¹, Keiji Iramina¹
¹Kyushu University, Japan

1C2-3 Activation in Somatosensory Cortex during Object Recognition Procedure
Zhaoxuan Li¹, De Bi¹, Wanqin Ma¹, Keiji Iramina¹
¹Kyushu University, Japan

1C2-4 Proposal of health index with Autonomic nervous system activity using RGB Video Images
Yu Ochiai¹, Shima Okada², Jeong Hieyong³, Yuko Ohno³, Masaaki Makikawa²
¹Ritsumeikan University, Graduate School of Science and Engineering, Japan
²Ritsumeikan University, Japan
³Osaka University, Japan
1C2-5  Involvement of GABAergic transmission in the nucleus accumbens related to the cue-selection behavior with a waiting period
Masaki Okubo 1, Kosuke Mastuzaki 1, Naoko Okada 1, Yutaka Komura 2, Riichi Kajiwara 1
1 Meiji University, Japan
2 Kyoto University, Japan

1C2-6  New mechanical surface processing for bearing part in artificial joint to reduce macrophage activation
Haruki Miyamoto 1, Nana Motojima 1, Yukio Fujiwara 1, Yuta Nakashima 1, Yoshitaka Nakanishi 1
1 Kumamoto University, Japan
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<tr>
<td>2A1</td>
<td>8:30 – 10:10</td>
<td>Nasal temperature: a new approach for continuous and noninvasive psychological status monitoring during acupuncture</td>
<td>Tianyi Wang 1, Hieyong Jeong 1, Shima Okada 2, Yuko Ohno 3</td>
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<td>1 Department of Robotics &amp; Design for Innovative Healthcare, Graduate School of Medicine, Osaka University, Japan,</td>
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<td>2 Department of Robotics, College of Science and Engineering, Ritsumeikan University, Japan</td>
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<td>3 Department of Mathematical Health Science, Graduate School of Medicine, Osaka University, Japan</td>
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<td>2A1</td>
<td>8:30 – 10:10</td>
<td>Evaluation of Basic Characteristics of A Non-contact Thermal Uroflowmeter</td>
<td>Shunsuke Ikegami 1, Takumi Kamimura 1, Yoshio Kanayama 1,2, Juhyon Kim 1, Hiroshi Kitamura 1, Kazuki Nakajima 1</td>
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<td>1 University of Toyama, Japan</td>
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<td>2 NEC Solution Innovators, Ltd., Japan</td>
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<tr>
<td>2A1</td>
<td>8:30 – 10:10</td>
<td>Color measurement on tissue with wearable device aimed for postoperative blood flow monitoring</td>
<td>Koichi Kida 1, Jian Gu 1, Yuki Sunaga 1, Itsuro Saito 2, Yoko Tomioka 3, Mutsumi Okazaki 3, Takao Someya 1, Masaki Sekino 1</td>
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<td></td>
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<td>1 Graduate School of Engineering, University of Tokyo, Japan</td>
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<td>2 Department of Biomedical Engineering, University of Tokyo, Japan</td>
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<td>3 Department of Plastic and Reconstructive Surgery, University of Tokyo, Japan</td>
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2A1-4  A Comparative Performance Between Molecularily Imprinted Polymer and Antibodies for Homocysteine in the Electrochemical Biosensor
Unchalee Kongintra, Chamras Promptmas1, Benchaporn Lertanantawong1
1 Mahidol University, Thailand

2A1-5  Electrochemical Synthesis of GaOOH Nanoparticles from Liquid Metals
Benchaporn Lertanantawong1, Panjaphong Lertsathitphong, Jamie D. Riches, Anthony O’Mullane
1 Mahidol University, Thailand
2 King Mongkut’s University of Technology Thonburi, Thailand
3 Queensland University of Technology, Thailand
Abstract:
Neural Engineering researches are a bridge between neuroscience field and engineering field. In this session, introducing various researches related to this topic, we would like to discuss the future Neural Engineering and its application.

2A2-1 Concurrent theta activity in intuitive understanding during an arithmetic task
Akira Okuwa 1, Arao Funase 1, Hironori Nakatani 2, Ichi Takumi 1
1 Nagoya Institute of Technology, Nagoya, Japan
2 Tokai University, Tokyo, Japan

2A2-2 Translingual Neurostimulation Device
Pisitpong Wongtha 1, Ariya Suthisophaarporn 1, Kitchanan Asavatamrat 1,
Yodchanan Wongsawat 1
1 Mahidol University, Thailand

2A2-3 EEG Time-Frequency Comparison of Standing and Sitting Motor Imagery
Rattanaphon, Chaisaen 1, Narin, Kunaseth 1, Pitshapor, Leelaarporn 1,
Apiwat, Ditthapron 1, Kanyarat, Boonkham 1, Theerawit, Wilaiprasitporn 1
1 BRAIN, Vidyasirimedhi Institute of Science and Technology, Thailand

2A2-4 EMG Time-Frequency Comparison of Standing and Attempting to stand tasks
Kanyarat, Boonkham 1, Apiwat, Ditthapron 1, Rattanaphon, Chaisaen 1,
Narin, Kunaseth 1, Pitshapor, Leelaarporn 1, Theerawit, Wilaiprasitporn 1
1 BRAIN, Vidyasirimedhi Institute of Science and Technology, Thailand
2A2-5 Integrated information in neural network
Takeru Kimura 1, Masafumi Oizumi 1, Jun Kitazono 1, Yuichiro Yada 1, Hirokazu Takahashi 1
1 The University of Tokyo, Japan

2A2-6 Development of artificial gap junction for stimulating neural systems
T. Yagi 1, Y. Miyamoto 1, K. Shimba 2, Z. Peng 1, H. Miyata 1, S. Jeon 1, G. Rix 1, T. Kawano 1, K. Wada 1, S. Kanno 1, Y. Kirihara 1
1 Tokyo Institute of Technology, 2 The University of Tokyo
2A3-1  Measuring Brain Activity for Preference Tasks Using fNIRS
Thanate Angsuwanakul\textsuperscript{1}, Wipavee Jung-In\textsuperscript{1}, Kittiya A-lad\textsuperscript{1},
Takenobu Matsuura\textsuperscript{1}
1 Rangsit University

2A3-2  Contribution of prefrontal cortex to attention conflicts in dual memory tasks
Ruimin Wang\textsuperscript{1}, Iramina Keiji\textsuperscript{1,2}
1 Graduate School of Systems Life Sciences, Kyushu University, Japan
2 Informatics Faculty of Information Science and Electrical Engineering, Kyushu University, Japan

2A3-3  NIRS data comparison using the standardized phantom
Y.Tanikawa\textsuperscript{1}, E.Okada\textsuperscript{2}, Y.Yamada\textsuperscript{3}, H.EDA\textsuperscript{4}
1 National Institute of Advanced Industrial Science and Technology, Japan
2 Keio University, Japan
3 The University of Electro-Communications, Japan
4 The Graduate School for the Creation of New Photonics Industries, Japan

2A3-4  The transition of optics instruments for fNIRS and fMRI
K.Kiyohara\textsuperscript{1}, H.Eda\textsuperscript{2}
1 Kiyohara Optics Inc., Japan
2 The Graduate School for the Creation of New Photonics Industries, Japan
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<td>2A4-1</td>
<td>Analysis of Pupil Fluctuations as Stress Evaluation Method</td>
<td>Ayako Katoh¹, Toshiyuki Yaguchi²</td>
<td>1 Saitama Medical University, Japan 2 Tokyo Denki University, Japan</td>
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<td>2A4-2</td>
<td>Inter-scorer reliability in manual scoring of sleep stages on single-channel EEG</td>
<td>Tatsuro Fujie¹, Yukari Tamamoto², Hideo Nakamura², Koichi Umimoto²</td>
<td>1 Morinomiya University of Medical Sciences, Japan 2 Osaka Electro-Communication University, Japan</td>
</tr>
<tr>
<td>2A4-3</td>
<td>Respiration and heartbeat measurement using capacitive electrode with resonant drive system</td>
<td>Morio Iwai¹, Koichiro Kobayashi¹, Naoki Honma¹, Atushi Satou²</td>
<td>1 Iwate University, Japan 2 EQUOS RESEARCH Co., Ltd., Japan</td>
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<td>2A4-4</td>
<td>Non-contact multi-vital in-bed measurements for nocturnal healthcare</td>
<td>Akinori Ueno¹</td>
<td>1 Tokyo Denki University, Japan</td>
</tr>
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<td>2A4-5</td>
<td>Development of wearable-type of multi channel wireless measuring system for EMG through cloth</td>
<td>Akihiko Tsukahara¹, Yutaro Yokoo¹, Keita Tanaka¹, Yoshinori Uchikawa¹</td>
<td>1 Tokyo Denki University, Japan</td>
</tr>
<tr>
<td>2A4-6</td>
<td>TeleMed Robot for Remotely Diagnosis</td>
<td>Korn Borvorntanajanya¹, Jackrit Suthakorn¹</td>
<td>1 Mahidol University, Thailand</td>
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</table>
2B1 8:30 – 10:10
General Session: Motor function & Muscle 1
Chairs: Shima Okada (Ritsumeikan University),
       Warakorn Charoensuk (Mahidol University)

2B1-1 Motion Intent prediction for sit-to-stand assist by measurement of lower limb EMG
Asuka Murakami 1, Shima Okada 2, Masaaki Makikawa 2
1 The Graduate school of Ritsumeikan University, Japan
2 Ritsumeikan University, Japan

2B1-2 Human body fall behavior of based wearable measuring
Huang Shiannfong 1, Chen Yan-Cheng 2, Lai Tzu-Hsien 3
1 Oriental Institute of Technology, Taiwan
2 National Taiwan Normal University, Taiwan
3 Far Eastern Memorial Hospital, Taiwan

2B1-3 The difference of postural control mechanism between normal weight and overweight groups: a study on the plantar force in three regions of foot
Thunaynoot Prasertsakul 1, Warakorn Charoensuk 1
1 Mahidol University, Thailand

2B1-4 A Review of Methods of Cervical Spine Range of Motion Measurement
Kittisak Chotikkakamthorn 1, Panrasee Ritthipravat 1
1 Mahidol University, Thailand

2B1-5 SMART Alarming Insole System
Udomporn Manupibul 1, Warakorn Charoensuk 1
1 Mahidol University, Thailand
2B2 10:30 – 12:30
General Session: Motor function & Muscle 2
Chairs: Naruhiro Shiozawa (Ritsumeikan University),
        Pornchai Phukpattaranont (Prince of Songkla University)

2B2-1  Observer Based Force Control for Surgical tool Insertion
        Branesh M. Pillai ¹, Jackrit Suthakorn ¹
        1 Mahidol University, Thailand

2B2-2  Investigation of the relation between muscle activity and motor
        imagery based on the muscle contraction types
        Nyi Nyi Tun ¹, Keiji Iramina ¹
        1 Kyushu University, Japan

2B2-3  Trial-to-trial peak-force variability is associated with muscle
        activity pattern during repeated maximal plantar flexions
        Chinami Taki ¹, Naruhiro Shiozawa ¹, Tetsuya Kimura ²
        1 Ritsumeikan University, Japan
        2 Kobe University, Japan

2B2-4  Recognition of EMG from finger movements for robotic hand
        control
        Pornchai Phukpattaranont ¹
        1 Prince of Songkla University, Thailand

2B2-5  Proposal of an Integrated Muscle Relaxation Index in General
        Anesthesia
        Shitong Yuan ¹, Masateru Tanimoto ², Eiko Furutani ³, Toshihiro Takeda ⁴,
        Tomomichi Sugawara ⁴, Kenji Kuroda ⁴, Gotaro Shirakami ⁴
        1 Kyoto University, Japan
        2 Sony Japan
        3 University of Hyogo, Japan
        4 Kagawa University, Japan
Rehabilitation in facial palsy
Ratanapat Chanubol
1 Prasat Neurological Institute, Thailand
2B3-1  Real-time Sweat Lactate Monitoring System Embedded on an Armband for Evaluation of Exercise Intensity
Sakae Konno¹, Masanobu Suzuki¹, Yusuke Suzuki¹, Hiroyuki Kudo¹
¹ Meiji University, Japan

2B3-2  A MEMS Approach to Intracranial Pressure Monitoring
Preedipat Sattayasootthorn¹, Jackrit Suthakorn¹, Sorayouth Chamnanvej¹
¹ Mahidol University, Thailand

2B3-3  Flexible sensor array for monitoring physiological signals
Masaki Sekino¹, Jain Gu¹, Koichi Kida¹, Yuki Sunaga¹, Yoko Tomioka¹,
Mutsumi Okazaki¹, Itsuro Saito², Takao Someya¹
¹ The University of Tokyo, Japan
² iMed Japan, Japan

2B3-4  Synthesis of Poly(L-lysine) for the Fabrication of PICsome
P. Chinavinijkul¹, N. Nasongkla¹
¹ Mahidol University, Thailand

2B3-5  Synthesis and Purification of Technetium-99m Labeled Polymeric Micelles for Cancer
Wirat Assawapanumat¹, Sopon Udomphon, Chanisa Chotipanich¹,
Panya Sunintaboon¹, Norased Nasongkla¹
¹ Mahidol University, National Cyclotron and PET Centre, Thailand

14:00 – 15:40
General Session: Sensor 3
Chairs: Masaki Sekino (The University of Tokyo), Yunyong Punsawad (Silpakorn University)
2B4-1  Heart Rate Variability Response to Low-Level Carbon Dioxide Exposure in Indoor Environment
Miki Kaneko, Taiki Shigematsu, Satoshi Nakae, Ken Kiyono
1 Osaka University, Japan

2B4-2  Pilot study on symbolic dynamic analysis of heart rate variability for evaluating three emotions
Muhammad Shaufil Adha 1, Tomohiko Igasaki 1
1 Kumamoto University, Japan

2B4-3  A Preliminary Study on Excretion Electrocardiogram to Personal Identification in the Toilet
Arata Nakagawa 1, Juhyon Kim 1, Kazuki Nakajima 1
1 University of Toyama, Japan

2B4-4  Intelligence ECG Monitor: Wireless platform and Application in Arrhythmia classifier
Jirawat Iamsamang 1, Panida Cen 1, Weerapat Delong 1, Phornphop Naiyanetr 1
1 Mahidol University

2B4-5  Development of under-wear type device for electrocardiograph measurement
Daisuke Goto 1, Chinami Taki 1, Minori Nakatani 1, Takuya Toyoshi 1,
Sima Okada 1, Naruhiro Shiozawa 1
1 Ritsumeikan University, Japan

2B4-6  Development of Automatic Sleep Stage Classification System using EMG and ECG Signals for Power Nap Monitoring Prototype
Wachira Porn Aiamklin 1, Yunyong Punsawad 1
1 Silpakorn University, Thailand
## Room C Day 2 Saturday, August 24

### 2C1 10:30-12:30

**General Session: Imaging & Optics**

**Chairs:** Takehito Hayami (Okayama University), Kajornvut Ounjai (King Mongkut's University of Technology Thonburi)

### 2C1-1

**Time-lapse optical imaging system for monitoring the resting membrane potential change of neurons in a mouse brain slice**

Yoko Machida¹, Yuta Yamada¹, Shota Mizunuma¹, Takashi Tominaga², Riichi Kajiwara¹

¹ Meiji University, Japan  
² Tokushima Bunri University, Japan

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### 2C1-2

**The image analysis to detect erythrocytes’ damage induced by high shear stress**

Masataka Inoue¹, Masaya Hakozaki¹, Jarod T. Horobin², Antony P. McNamee², Geoff D. Tansley³, John F. Fraser⁴, Michael J. Simmonds², Masahiro Shibata¹, Nobuo Watanabe¹

¹ Dept. of Life Sciences, Systems Engineering and Science, Graduate School of Engineering and Science, Shibaura Institute of Technology, Japan  
² Menzies Health Institute Queensland, Griffith University, Australia  
³ School of Engineering and Built Environment, Griffith University, Australia  
⁴ Critical Care Research Group, The Prince Charles Hospital, Australia

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### 2C1-3

**System integration of a fluoroscopic image calibration using robot assisted surgical guidance for Distal locking process in closed intramedullary nailing of femur**

Sakol Nakdhamabhorn¹, Jackrit Suthakorn¹

¹ Mahidol University, Thailand

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### 2C1-4

**Modeling of Fixational Eye Movement Using a non-Gaussian State-Space Model**

Hisashi Yoshida¹, Kaito Nagano¹, Yoshitaka Kitaoka¹, Takeshi Kohama¹

¹ Department of Computationa Systems Biology, Kindai University, Japan
2C1-5 **Headgear free eye tracker for developmental disorder screening using multiple video cameras**
Naoya Tanaka \(^1\), Takehito Hayami \(^1\), Takashi Matsuo \(^2\), Kazuko Yoshioka \(^3\), Kyosuke Fukuda \(^3\), Kazunori Shidoji \(^4\)
1 Okayama University, Japan
2 The University of Kitakyushu, Japan
3 Fukuoka Prefectural University, Japan
4 Kyushu University, Japan

2C1-6 **Logical Ensemble for Segmentation of Minority Classes in Medical Images using Deep Learning**
S. Tanpradit \(^1\), T. Angsuwatanakul \(^1\), M. Sangworasil \(^1\), T. Matsuura \(^1\),
J. A. O'Reilly \(^1\)
1 Rangsit University, Thailand
Abstract:
Sensors are becoming smaller and more sophisticated. This makes long-term monitoring of biological information easier. As a result, research on human condition estimation technology development is in progress. A person's urination and defecation can be a very effective indicator to know a person's condition. In this session, we will focus on the toilet and discuss related IoT technologies.

3A1-1  Development and evaluation of a noncontact uroflowmeter
Kazuki Nakajima 1, Yoshio Kanayama 1,2, Syunsuke Ikegami 1,
Takumi Kamimura 1, Kazunari Toda 2, Mamoru Hagiwara 3,
Hiroshi Kitamura 1
1 University of Toyama, Toyama, Japan
2 NEC Solution Innovators, Ltd., Tokyo, Japan
3 Richell Corp., Toyama, Japan

3A1-2  Salt Intake Reduction without Degrading QOL Using Salt Chip®
Norihisa Miki 1,2, Kazuhiko Higashi 2
1 Keio University, Japan
2 LTaste Inc., Japan

3A1-3  Home uroflowmetry system with NB-iot communication.
S. Rattanasomrerk 1, P. Naiyanetr 1
1 Mahidol University, Thailand
3A1-4  

**Study on urinary flow rate and volume based on multiple measurements per healthy adult Japanese men using a portable uroflowmeter (P-Flowdiary®)**

Masatake Shinohara¹, Kazumasa Torimoto², Atsushi Yamada³, Chie Matsushita¹, Hisashi Yoshida⁴, Toshihisa Saka¹, Yoshihiko Hirao¹, Akihide Hirayama⁵, Nobumichi Tanaka², Kiyohide Fujimoto²

1 Department of Urology, Osaka Gyoumeikan Hospital, Japan  
2 Department of Urology, Nara Medical University, Japan  
3 Department of Urology, Morinomiya Hospital, Japan  
4 Faculty of Biology-Oriented Science and Technology, Kindai University, Japan  
5 Department of Urology, Kindai University Nara Hospital, Japan

3A1-5  

**Flow Rate Estimation by Image Recognition of Simulated Urinary Flowing in the Toilet Bowl**

Haruki Kawanaka¹, Koji Oguri¹

1 Aichi Prefectural University, Japan
Abstract:
Nowadays intelligent working machines and electronic devices made the repair and the extension of our body easier and more precise, especially in the fields of medicine and physiology. The musculoskeletal system which works as a slave in our body is recognized as a commander in man-machine system. The aim of this session is to make us revise the notion of the musculoskeletal system as a seamless one which connects between brain science, biomaterials and robotics by viewing the both roles of it, being composed of muscles and bones.

3A2-1 New mechanical surface processing for bearing part in artificial joint to reduce macrophage activation
Haruki Miyamoto ¹, Nana Motojima ¹, Yukio Fujiwara ¹, Yuta Nakashima ¹, Yoshitaka Nakanishi ¹
1 Kumamoto University, Japan

3A2-2 Engineered bone scaffolds using 3D-printing technology
Warachote Shinwasusin ¹, Apavisakarn CharoenSirisrap ¹, Phornphop Naiyanetr ¹
1 Mahidol University, Thailand

3A2-3 Three-dimensional multiscale surface-processing for creation of bio-inspired surfaces
Yoshitaka Nakanishi ¹, Kazuma Shibata ¹, Yuta Nakashima ¹
1 Kumamoto University, Japan
3A2-4  
**New objective skill assessment system for the laparoscopic intestinal anastomosis model and evaluation of validity**  
Munenori Uemura ¹, Morimasa Tomikawa ², Satoshi Ieiri ¹  
¹ Kagoshima University, Japan,  
² Kyushu University, Japan

3A2-5  
**Robot-Assisted Carrying System for Elderly**  
Bibhu Sharma ¹, Jackrit Suthakorn ¹  
¹ Mahidol University, Thailand

3A2-6  
**Effects of gaze distance on direct pupillary light response: relaxation curve analysis**  
Tomohiro Kimura ¹, Takehito Hayami ¹  
¹ Okayama University, Japan
3B1-1 Improvement in motor skill performance related to the daytime nap timing
Mako Ogawa 1, Takeshi Aihara 1, Hiroshi Sasaki 1
1 Tamagawa University, Japan

3B1-2 The development of upper extremity rehabilitation system based on combination of motor and cognitive training
Thitikorn Kaewlee 1, Panrasee Rithipravat 1
1 Mahidol University Thailand

3B1-3 A mathematical model and skeletal muscle fatigue
Yuttamol Muangkram 1, Akira Amano 1
1 College of Life Sciences, Ritsumeikan University, Japan

3B1-4 Toward a stable telesurgery: current approaches
Keita Ono
1 Mahidol University, Thailand

3B1-5 Design of a Delivery Robot Prototype for In-Hospital Used
Pittawat Thiuthipsakul, Jackrit Suthakorn
1 Department of Biomedical Engineering, Faculty of Engineering, Mahidol University, Thailand
3B2-1  EEG Activity during Playing Game Design for Neurofeedback
Ayumi Tahara¹, Nonthaporn Nakphu¹, Van Le Thi Cam¹,
Thitikorn Kaewlee², Yodchanan Wongsawat², Keiji Iramina¹
1 Kyushu University, Japan,
2 Mahidol University, Thailand

3B2-2  Thai Language Brain Spelling System
Dilok Puanhvuan¹, Yodchanan Wongsawat¹
1 Mahidol University, Thailand

3B2-3  Comparing ERD/ERS pattern of motor imagery in VR and No-VR condition
Fumiya Sanuki¹, Hiroyuki Iwata¹, Khanittha Kiatbamrungpunt², Keiji Iramina¹
1 Kyushu University, Japan
2 Mahidol University, Thailand

3B2-4  Visualization of visual pathway using spatiotemporal cortical dipole imaging considering filter property
Junichi Hori¹, Genki Shirato¹, Shota Saito¹
1 Niigata Univrsity, Japan

3B2-5  BCI-Based Emotion Ranking System for Neuromarketing
Nattapat Tanjariyaporn¹, Piset Jitwiriyanon¹, Yodchanan Wongsawat¹
1 Mahidol University, Thailand

3B2-6  Effects of auditory white noise on visual working memory
Toshihiro Tamura¹, Ruimin Wang¹, Keiji Iramina¹
1 Kyushu University, Japan