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<th>Time</th>
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<th>Title</th>
<th>Authors</th>
<th>Affiliation</th>
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<tr>
<td>08:00-08:15</td>
<td>WeAT4.1</td>
<td>Wearable Health Monitoring using Capacitive Voltage-Mode Human Body Communication</td>
<td>Maity, Shovan* (Purdue University); Das, Debayan (Purdue University); Sen, Shreyas (Purdue University)</td>
<td>(University of Connecticut)</td>
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<tr>
<td>08:15-08:30</td>
<td>WeAT4.2</td>
<td>A Self-Powered Glucose Biosensor based on Pyrroloquinoline Quinone Glucose Dehydrogenase and Bilirubin Oxidase Operating under Physiological Conditions</td>
<td>Kulkarni, Tanmay (University of Maryland Baltimore County); Slaughter, Gymama* (University of Maryland Baltimore County)</td>
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<td>08:30-08:45</td>
<td>WeAT4.3</td>
<td>Detection of Needle to Nerve Contact based on Electric Bioimpedance and Machine Learning Methods</td>
<td>Kalvøy, Håvard* (Rikshospitalet, Oslo University Hospital, Oslo, Norway); Tronstad, Christian (Oslo University Hospital); Ullensvang, Kyrre (Division of Emergencies and Critical Care, Dept. of Anaesth); Steinfeldt, Torsten (Philipps University of Marburg, Marburg an der Lahn, Hesse, Germ); Sauter, Axel R. (Dept. of Research and Development, Division of Emergencies)</td>
<td>(University of Connecticut); Steinfeldt, Torsten (Philipps University of Marburg, Marburg an der Lahn, Hesse, Germ); Sauter, Axel R. (Dept. of Research and Development, Division of Emergencies)</td>
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<tr>
<td>08:45-09:00</td>
<td>WeAT4.4</td>
<td>Testing the Need for Carbon in Salt/Adhesive Electrodes for Surface Electromyography Measurements: Preliminary Results</td>
<td>Posada-Quintero, Hugo Fernando* (University of Connecticut); Rood, Ryan (University of Connecticut); Ye, Xiang (University of Connecticut); Pias, Matthew (University of Connecticut); Burnham, Ken (FLEXcon Company, Inc.); Pennace, John (FLEXcon Company, Inc.); Chon, Ki (University of Connecticut)</td>
<td>(University of Connecticut); Pennace, John (FLEXcon Company, Inc.); Chon, Ki (University of Connecticut)</td>
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<td>09:00-09:15</td>
<td>WeAT4.5</td>
<td>A Rapid Quantitative Determination Method of Luteinizing Hormone with Gold Immunochromatographic Strip</td>
<td>Liu, Juntao (Institute of Electronics, Chinese Academy of Sciences); Kong, Zhuang (State Key Laboratory of Transducer Technology, Institute of Elect); Wang, Yang (Fan Yan The State Key Laboratory of Transducer Technolog); Fan, Yan (The State Key Laboratory of Transducer Technology, Institute of); Luo, Jiping (Institute of Electronics, Chinese Academy of Sciences); Xu, Shengwei (Institute of Electronics, Chinese Academy of Science); Jin, Hongyan (Obstetrics and Gynecology Dept., First Hospital Peking Univ); Cai, Xinxia* (Institute of Electronics, Chinese Academy of Sciences)</td>
<td>(Institute of Electronics, Chinese Academy of Sciences); Jin, Hongyan (Obstetrics and Gynecology Dept., First Hospital Peking Univ); Cai, Xinxia* (Institute of Electronics, Chinese Academy of Sciences)</td>
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<td>09:15-09:30</td>
<td>WeAT4.6</td>
<td>Integration of Piezo-Capacitive and Piezo-Electric Nanoweb based Pressure Sensors for Imaging of Static and Dynamic Pressure Distribution</td>
<td>Jeong, You Jeong (Kyung Hee University); Oh, Tong In* (Kyunghee University); Woo, Eung Je (Kyung Hee University); Kim, Kap Jin (Kyung Hee University)</td>
<td>(Kyung Hee University); (Kyunghee University); (Kyung Hee University); (Kyung Hee University)</td>
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</tbody>
</table>
WeAT7: 08:00-09:30  
Herrick Room  
**Novel Approaches to BME Education** (Oral Session)  
**Chair:** Kant Kumar, Dinesh *(RMIT University)*  
**Co-Chair:** Esterer, Benjamin *(University of Applied Sciences Upper Austria)*

08:00-08:15  
**Problem based Learning for Engineering**  
Radcliffe, Pj* *(RMIT University)*; Kant Kumar, Dinesh *(RMIT University)*

08:15-08:30  
**A Course in Prosthetics for the Developing World: Merging Education, Research, and Industry to Teach Biomedical Design for Social Impact**  
Ranger, Bryan* *(Massachusetts Institute of Tech.)*; Mantzavinou, Aikaterini *(Massachusetts Institute of Tech.)*

08:30-08:45  
**The Role of a Creative Joint Assignment* Project in Biomedical Engineering Bachelor Degree Education**  
Jiang, Jiehui* *(Shanghai University)*; Zhang, Yuting *(Shanghai University)*; Zhou, Mi *(Shanghai University)*; Zheng, Xiaosong *(Shanghai University)*; Yan, Zhuangzhi *(Shanghai University)*

08:45-09:00  
**Design and Development of an Intelligent Nursing Bed a Pilot Project of “Joint Assignment”**  
Jiang, Jiehui* *(Shanghai University)*; Liu, TingWei *(Shanghai University)*; Zhang, Yuting *(Shanghai University)*; Song, Wolf *(Delft University of Technology)*; Zhou, Mi *(Shanghai University)*; Zheng, Xiaosong *(Shanghai University)*; Yan, Zhuangzhi *(Shanghai University)*

09:00-09:15  
**A Hybrid, Low-Cost Tissue-Like Epidural Needle Insertion Simulator**  
Esterer, Benjamin* *(University of Applied Sciences Upper Austria)*; Gabauer, Stefan *(Research Group for Surgical Simulators Linz, Upper Austria Univ.)*; Pichler, Robert *(Johannes Kepler University Linz)*; Wirthl, Daniela *(Johannes Kepler University Linz)*; Drack, Michael *(Johannes Kepler University Linz)*; Hollensteiner, Marianne *(Upper Austria University of Applied Sciences)*; Kettigrubner, Gerald *(Johannes Kepler University Linz)*; Kaltenbrunner, Martin *(Johannes Kepler University Linz)*; Bauer, Siegfried *(Johannes Kepler University)*; Fuerst, David *(Upper Austria University of Applied Sciences)*; Merwa, Robert *(University of Applied Sciences Upper Austria)*; Meier, Jens *(Kepler University Linz)*; Augat, Peter *(Institute for Biomechanics, BGU Murnau)*; Schrempf, Andreas *(Upper Austria University of Applied Sciences)*

09:15-09:30  
**Novel Synthetic Vertebrae Provide Realistic Haptics for Pedicle Screw Placement**  
Hollensteiner, Marianne* *(Upper Austria University of Applied Sciences)*; Augat, Peter *(Institute for Biomechanics, BGU Murnau)*; Fuerst, David *(Upper Austria University of Applied Sciences)*; Esterer, Benjamin *(University of Applied Sciences Upper Austria)*; Gabauer, Stefan *(Research Group for Surgical Simulators Linz, Upper Austria Univ.)*; Püschel, Klaus *(University of Hamburg)*; Schroedl, Falk *(Paracelsus Medical University)*; Schrempf, Andreas *(Upper Austria University of Applied Sciences)*

WeAT8: 08:00-09:30  
Schwan Room  
**Neuromuscular Systems I** (Oral Session)

08:00-08:15  
**Characterizing Dynamic Balance during Adaptive Locomotor Learning**  
Park, Sungwoo* *(University of Southern California)*; Finley, James *(University of Southern California)*

08:15-08:30  
**Early Prediction of Future Hand Movements using sEMG Data**  
Koch, Philipp* *(University of Luebeck)*; Phan, Huy *(University of Luebeck)*; Maaß, Marco *(University of Luebeck)*; Katzberg, Fabrice *(University of Luebeck)*; Martins, Alfred *(University of Luebeck)*

08:30-08:45  
**Muscle Contractions in Cyclic Movements: Optimization of CIMAP Algorithm**  
Rosati, Samanta *(Politecnico di Torino)*; Castagneri, Cristina *(Politecnico di Torino)*; Agostini, Valentina* *(Politecnico di Torino)*; Knaflitz, Marco *(Politecnico di Torino)*; Balestra, Gabriella *(Politecnico di Torino)*
Simple Space-Domain Features for Low-Resolution EMG Pattern Recognition

Donovan, Ian (San Francisco State University); Puchin, Juris (San Francisco State University);
Okada, Kazunori (San Francisco State University); Zhang, Xiaorong* (San Francisco State University)

Movement Augmentation to Evaluate Human Control of Locomotor Stability

Brown, Geoffrey (Northwestern University); Wu, Mengnan/Mary (Northwestern University); Huang, Felix
(Rehabilitation Institute of Chicago); Gordon, Keith* (Feinberg School of Medicine, Northwestern University)

Ankle Intrinsic Stiffness is Modulated by Postural Sway

Amiri, Pouya* (Dept. of Biomedical Engineering, McGill); Kearney, Robert Edward (McGill Univ.)

Predicting the Outcome for Patients in a Heart Transplantation Queue using Deep Learning

Medved, Dennis* (Lund University); Nilsson, Johan (Dept. Clinical Sciences Lund, CardioThoracic Surgery,
Lund Univ.); Nugues, Pierre (Lund University)

Staged Inference using Conditional Deep Learning for Energy Efficient Real-Time Smart Diagnosis

Parsa, Maryam (Purdue Univ.); Panda, Priyadarshini (Purdue Univ.); Sen, Shreyas (Purdue Univ.);
Roy, Kaushik* (Purdue Univ.)

Classifying Osteosarcoma Patients using Machine Learning Approaches

Li, Zhi* (University of Michigan); Sorounshmeer, S.M.Reza (University of Michigan, Ann Arbor); Hua, Yingqi
(Shanghai Bone Tumor Institute, Shanghai General Hospital, Shanghai); Mao, Min (Shanghai Bone Tumor
Institute, Shanghai General Hospital, Shanghai); Qiu, Yunping (Albert Einstein College of Medicine);
Najarian, Kayvan (University of Michigan - Ann Arbor)

Development of a Three Dimensional, Multiscale Agent-Based Model of Ductal Carcinoma in Situ

Butner, Joseph (University of New Mexico); Cristini, Vittorio (University of New Mexico); Wang, Zhihui*
(University of Texas Health Science Center at Houston McGovern Me)

Elucidating the Biophysical Processes Responsible for the Chromatic Attributes of Peripheral Cyanosis

Baranoski, Gladimir Valerio Guimaraes* (University of Waterloo); Van Leeuwen, Spencer Richard (University of
Waterloo); Chen, Teng Francis (University of Waterloo)

SMARTool: A Tool for Clinical Decision Support for the Management of Patients with
Coronary Artery Disease based on Modeling of Atherosclerotic Plaque Process

Sakellarios, Antonis (Unit of Medical Technology and Application Systems, Dept of Mate); Rigas, Georgios
(University of Ioannina); Kigka, Vassiliki (University of Ioannina); Siogkas, Panagiotis (FORTH-IMBB);
Tsompou, Panagiota (Unit of Medical Technology and Intelligent Information Systems,); Karanasiou, Georgia
(University of Ioannina, Dept. of Materials Science, Unit of); Exarchos, Themis P. (Unit of Medical Tech &
Intelligent Info); Andrikos, Ioannis (University of Ioannina); Tachos, Nikolaos (Unit of Medical Technology and
Intelligent Information Systems,); Pelosi, Gualtiero (Institute of Clinical Physiology, National Research Council,
561); Parodi, Oberdan (CNR Clinical Physiology Institute - Milan); Fotiadis, Dimitrios I.* (University of Ioannina)
**WeAT11: 08:00-09:30**  
**PPG Signal Analysis (Oral Session)**  
**Chair:** de Chazal, Philip *(University of Sydney)*

08:00-08:15  
**Coronary Artery Disease Detection using Photoplethysmography**  
Paradkar, Neeraj* *(International Institute of Information Technology)*; Roy Chowdhury, Shubhajit *(Indian Institute of Technology Mandi)*  

08:15-08:30  
**Computationally Efficient Algorithm for Photoplethysmography-Based Atrial Fibrillation Detection using Smartphones**  
Schäck, Tim* *(Technische Universität Darmstadt)*; Safi Harb, Yosef *(Happitech)*; Muma, Michael *(Technische Universität Darmstadt)*; de Jong, Jonas S. S. G. *(OLVG Hospital)*; Zoubir, Abdelhak M. *(Signal Processing Group, Institute of Telecommunications, Techni)*

08:30-08:45  
**A Novel Method for Accurate Estimation of HRV from Smartwatch PPG Signals**  
Bhowmik, Tanmoy* *(Samsung Research Institute)*; Dey, Jishnu *(Samsung R&D Institute India, Bangalore)*; Tiwari, Vijay Narayan *(Samsung Research India, Bangalore)*

08:45-09:00  
**Cardiac Arrhythmia Detection using Photoplethysmography**  
Paradkar, Neeraj* *(International Institute of Information Technology)*; Roy Chowdhury, Shubhajit *(Indian Institute of Technology Mandi)*

09:00-09:15  
**Photoplethysmography Beat Detection and Pulse Morphology Quality Assessment for Signal Reliability Estimation**  
Papini, Gabriele* *(Eindhoven University of Technology)*; Fonseca, Pedro *(Philips Research and Eindhoven University of Technology)*; Aubert, Xavier *(Philips Research Laboratories Europe)*; Overeem, Sebastiaan *(Kennemer Foundation, Sleep Medicine Centre)*; Bergmans, Johannes Wilhelmus Maria *(Eindhoven University of Technology)*; Vullings, Rik *(Eindhoven University of Technology)*

09:15-09:30  
**Enhanced Detection of Sleep Apnoea using Heart-Rate, Respiration Effort and Oxygen Saturation Derived from a Photoplethysmography Sensor**  
Jayawardhana, Madhuka* *(University of Sydney)*; de Chazal, Philip *(University of Sydney)*

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**WeAT12: 08:00-09:30**  
**Clinical Applications of Mobility Assessment (Oral Session)**  
**Chair:** Tamura, Toshiyo *(Waseda University)*

08:00-08:15  
**An Elderly Fall Detection using a Wrist-Worn Accelerometer and Barometer**  
Jatesiktat, Prayook* *(NTU)*; Ang, Wei Tech *(Nanyang Technological University)*

08:15-08:30  
**Using Measurements from Wearable Sensors for Automatic Scoring of Parkinson's Disease Motor States: Results from 7 Patients**  
Thomas, Ilias *(Dalarna Univ.)*; Bergquist, Filip *(Gothenburg Univ.)*; Constantinescu, Radu *(Gothenburg Univ.)*; Nyholm, Dag *(Uppsala Univ.)*; Senek, Marina *(Uppsala Univ.)*; Memedi, Mevludin* *(Dalarna Univ.)*

08:30-08:45  
**Artifact Detection in Accelerometer Signals Acquired from the Carotid**  
Muehlsteff, Jens *(Philips)*; Santos de Oliveira e Silva, Bernardo Jose’ *(Univ. of Coimbra)*; Couceiro, Ricardo* *(Univ. of Coimbra)*; Henriques, Jorge *(Univ. of Coimbra)*; de Carvalho, Paulo *(Univ. of Coimbra)*
Development of a Wearable Plantar Force Measurement Device for Gait Analysis in Remote Conditions .......... 139-142
Hamid, Rawnak (Biomedical Integrated Circuits and Sensors Laboratory, Electric); Yuce, Mehmet* (Monash University); Redouté, Jean-Michel (Monash University); McMillan, Lachlan (Dept. of Medicine, School of Clinical Sciences at Monash He); Scott, David (Dept. of Medicine, School of Clinical Sciences at Monash He); Wijesundara, Suharshani (Dept. of Electrical and Computer Systems Engineering, Monash); Ebeling, Peter R (Dept. of Medicine, School of Clinical Sciences at Monash He)

Weakly-Supervised Learning for Parkinson's Disease Tremor Detection ................................................................. 143-147
Zhang, Ada* (Carnegie Mellon University); Cebulla, Alexander (ETH Zurich); Panev, Stanislav (Carnegie Mellon University); Hodgins, Jessica (Carnegie Mellon University); Torre, Fernando de la (Carnegie Mellon University)

Real-Time Gait Analysis with Accelerometer-Based Smart Shoes ........................................................................ 148-148
Delgado-Gonzalo, Ricard* (CSEM); Hubbard, Jeremy (ICON Health & Fitness); Renevey, Philippe (CSEM); Lemkaddem, Alia (CSEM); Vellinga, Quinn (iFit); Ashby, Darren (ICON Health & Fitness Inc.); Jared, Willardson (ICON Health & Fitness Inc.); Bertschi, Mattia (CSEM)
Cranial Ultrasound-Based Prediction of Post Hemorrhagic Hydrocephalus Outcome in Premature Neonates with Intraventricular Hemorrhage

Roshanitabrizi, Pooneh* (Children’s National Health System); Obeid, Rawad (Children’s National Health System); Mansoor, Awais (Children’s National Health System); Ensel, Scott (Children’s National Medical Center); Cerrolaza, Juan J. (Imperial College London); Penn, Anna (Children’s National Medical Center); Linguraru, Marius George (Children’s National Health System)

WeBT4: 14:20-15:05
Novel Sensing Methods II (Oral Session)
Chair: Dong, Tao (University College of Southeast Norway)

A Low Power Flash-FPGA based Brain Implant Micro-System of PID Control

Xia, Lijuan* (Electrical Engineering College); Fattah, Nabeel (Newcastle University); Soltan, Ahmed (Newcastle University, School of Electrical, Electronic and Computer); Jackson, Andrew (Newcastle University); Chester, Eric Graeme (Newcastle University); Degenaar, Patrick (Newcastle University)

Smart Mat System with Pressure Sensor Array for Unobtrusive Sleep Monitoring

Li, Wei* (Fudan Univ.); Sun, Chenglu (Fudan Univ.); Yuan, Wei (Printable Electronics Research Centre, Suzhou Institute of Nanot); Gu, Weibing (Printable Electronics Research Centre, Suzhou Institute of Nanot); Cui, Zheng (Printable Electronics Research Centre, Suzhou Institute of Nanot); Chen, Wei (Fudan Univ.)

Design of a Microfluidic Paper-Based Device for Analysis of Biomarkers from Urine Samples on Diapers

Couto, Adriana (University of Minho); Dong, Tao* (University College of Southeast Norway)

Stability of Colorimetric Results in the Detection of Urine Biomarkers using a Paper-Based Analytical Device

Bertão, Ana (Høgskolen i Sørøst-Norge avd Vestfold); Dong, Tao* (University College of Southeast Norway)

Injection Moulded Microneedle Sensor for Real-Time Wireless pH Monitoring

Mirza, Khalid* (Imperial College London); Zuliani, Claudio (Imperial College London); Hou, Benjamin (Imperial College London); Ng, Fu Siong (Imperial College London); Peters, Nicholas (Imperial College London); Toumazou, Christofer (Imperial College London)

Carbon Nanospikes for Biosensing Applications

Shanta, Aysha Siddique* (The University of Tennessee); Mamun, Khandaker (University of Tennessee); Hensley, Dale (oak ridge National Laboratory); Lavrik, Nickolay (oak ridge National laboratory); Islam, Syed Kamrul (University of Tennessee); McFarlane, Nicole (University of Tennessee)

Motor Neuroprostheses (Oral Session)
Chair: Youn, Inchan (Korea Institute of Science and Technology)

Multiscale Decoding for Reliable Brain-Machine Interface Performance Over Time

Hsieh, Han-Lin* (University of Southern California); Wong, Yan Tat (New York University); Pesaran, Bijan (New York University); Shanechi, Maryam (University of Southern California)

An Unsupervised Learning Algorithm for Multiscale Neural Activity

Abbaspourazad, Hamidreza* (Univ. of Southern California); Shanechi, Maryam (Univ. of Southern California)
14:50-15:05  WeBT8.3
Zhou, Yuxuan (School of Basic Medical Science, Nanjing Medical University); Wang, Haipeng (Southeast University, Institute of RF- & OE-ICs); Cao, Xiaopeng (Southeast University); Bi, Zhengyang (Southeast University, State Key Lab of Bioelectronics); Gao, Yujie (Southeast University); Chen, Xiaobin (Southeast University); Lu, Xiaoying* (Southeast University); Wang, Zhigong (Southeast University)

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Low-Intensity Focused Ultrasound Stimulator using Focal Depth Controller for Improved Targeting in Neuromuscular Rehabilitation ......................................................................................... 209-212
Oh, Sungjin (Korea Institute of Science and Technology); Kim, DongHwee (Korea Institute of Science and Technology); Youn, Inchon* (Korea Institute of Science and Technology)

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Towards a Wearable Hand Exoskeleton with Embedded Synergies .......................................................... 213-216
Burns, Martin (Stevens Institute of Technology); Van Orden, Katie (Stevens Institute of Technology); Patel, Vrajeshri (Stevens Institute of Technology); Vinjamuri, Ramana* (Stevens Institute of Technology)

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WeBT9: 14:20-15:50  Plonsey Room
Neural Interfaces I (Oral Session)
Chair: Kim, Keehoon (Korea Institute of Science and Technology)

14:20-14:35  WeBT9.1
An Integrated Multichannel Neural Recording Analog Front-End ASIC with Area-Efficient Driven Right Leg Circuit ................................................................. 217-220
Tang, Tao* (NTU); Goh, Wang Ling (Nanyang Tech. Univ.); Yao, Lei (Institute of Microelectronics, Singapore); Cheong, Jia Hao (Institute of Microelectronics); Gao, Yuan (Institute of Microelectronics, Singapore)

14:35-14:50  WeBT9.2
Rodent Wearable Ultrasound System for Wireless Neural Recording ...................................................... 221-225
Piech, David* (University of California - Berkeley); Kay, Joshua (University of California - Berkeley); Boser, Bernhard (UC Berkeley); Maharbiz, Michel (University of California, Berkeley)

14:50-15:05  WeBT9.3
A Handheld Device for Magnetically Inserting a Neural Interface into a Peripheral Nervous System ............ 226-229
Yim, Sehyuk (Korea Institute of Science and Tech.); Hwang, Donghyun (Korea Institute of Science and Tech.); Ihn, Yong Seok (Korea Institute of Science and Tech.); Jeong, Jinwoo (Sungkyunkwan University); Oh, Sang-Rok (Korea Institute of Science and Tech.); Kim, Keehoon* (Korea Institute of Science and Tech.)

15:05-15:20  WeBT9.4
Unidirectional Ephaptic Stimulation between Two Myelinated Axons .......................................................... 230-233
Capllonch Juan, Miguel* (University of Essex); Kolbl, Florian (University of Bordeaux); Sepulveda, Francisco (University of Essex)

15:20-15:35  WeBT9.5
Novel Integration and Packaging Concepts of Highly Miniaturized Inductively Powered Neural Implants .......... 234-237
Khalifa, Adam* (Johns Hopkins University); Karimi, Yasha (Stony Brook University); Stanacevic, Milutin (Stony Brook University); Etienne-Cummings, Ralph (Johns Hopkins University)

15:35-15:50  WeBT9.6
Design of Contact Zone Topography for Implantable High-Channel Electrical Connectors .......................... 238-241
Koch, Julia* (Univ. of Freiburg); Schuettler, Martin (Univ. of Freiburg); Stieglitz, Thomas (Univ. of Freiburg)
Voice Frequency Analysis: Expectation for the Convenient but Powerful Diagnostic Tool for Neuropsychiatric Disorders (Invited Session)

Chair: Morimoto, Yuji (National Defense Medical College)
Co-Chair: Tokuno, Shinichi (The University of Tokyo)

Difference in Voice Analysis Result by Pre and Post Processing of Telephone Line

Hagiwara, Naoki* (PST Inc.); Omiya, Yasuhiro (PST Inc.); Shinohara, Shuji (The Univ. of Tokyo); Nakamura, Mitsuteru (The Univ. of Tokyo); Higuchi, Masakazu (The Univ. of Tokyo); Mitsuyoshi, Shunji (Dept. of Verbal Analysis of Pathophysiology Graduate School of M); Tokuno, Shinichi (The Univ. of Tokyo)

Pulse Transit Time/Arterial Stiffness (Oral Session)

Chair: Avolio, Alberto P (Macquarie University)
Co-Chair: Sivaprakasam, Mohanasankar (Indian Institute of Technology Madras)

Reproducibility of Photoplethysmography-Based Local Pulse Transit Time Measurement

Beckmann, Nils* (University of Duisburg-Essen); Viga, Reinhard (University of Duisburg-Essen); Dogangün, Aysegül (University of Duisburg-Essen); Grabmaier, Anton (University of Duisburg-Essen)

Pulse Arrival Time (PAT) Measurement based on Arm ECG and Finger PPG Signals – Comparison of PPG Feature Detection Methods for PAT Calculation

Rajala, Satu* (Nokia Technologies); Ahmaniemi, Teemu (Nokia Technologies); Lindholm, Harri (Nokia Technologies); Taipalus, Tapio (Nokia Technologies)

Pulse Arrival Time Measurement with Coffee Provocation

Ahmaniemi, Teemu* (Nokia Technologies); Rajala, Satu (Nokia Technologies); Lindholm, Harri (Nokia Technologies); Taipalus, Tapio (Nokia Technologies)

Increased Arterial Stiffness does not Respond to Renal Denervation in an Animal Model of Secondary Hypertension

Yao, Yimin (Dept. of BioMedical Sciences, Faculty of Medicine and Health); Hildreth, Cara (Dept. of BioMedical Sciences, Faculty of Medicine and Health); Li, Sheran (Dept. of BioMedical Sciences, Faculty of Medicine and Health); Boyd, Rochelle (Dept. of BioMedical Sciences, Faculty of Medicine and Health); Kouchaki, Zahra (Macquarie University); Butlin, Mark (Macquarie University); Avolio, Alberto P* (Macquarie University); Pilowksy, Paul M (Heart Research Institute and University of Sydney); Phillips, Jacqueline Kathleen (Faculty of Medicine and Health Sciences, Macquarie University)

Brachial Artery Stiffness Estimation using ARTSENS

V, Raj Kiran* (IIT Madras); PM, Nabeel (Indian Institute of Technology Madras); Joseph, Jayaraj (HTIC, Indian Institute of Technology Madras); Shah, Malay Ilesh (Healthcare Technology Innovation Center (HTIC), Indian Institute); Sivaprakasam, Mohanasankar (Indian Institute of Technology Madras)

Modeling Young and Adult Patients with Cirrhosis through a Three Element Windkessel (WK3e)

Cymberknop, Leandro Javier (Universidad Tecnológica Nacional); Farro, Ignacio (School of Medicine, Republic University); Arbeitman, Claudia (Engineering and Exact and Natural Sciences Faculty, Favaloro Uni); Cardelino, Juan (Faculty of Engineering, Republic University); Armentano, Ricardo Luis* (Republic University)
### WeBT12: 14:20-15:50
**Ambulatory Diagnostic and Therapeutic Systems (Oral Session)**

**Chair:** Chbat, Nicolas W. *(Center of Excellence in Critical Care Innovation)*

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<tr>
<td>14:20-14:35</td>
<td>WeBT12.1</td>
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<tr>
<td><strong>SVM Classifier on Chip for Melanoma Detection</strong></td>
<td>Afifi, Shereen <em>(Auckland University of Technology)</em>; GholamHosseini, Hamid* <em>(Auckland University of Technology)</em>; Sinha, Roopak <em>(Auckland University of technology)</em></td>
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<td>14:35-14:50</td>
<td>WeBT12.2</td>
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<td><strong>Developing Interactive and Simple Electromyogram PONG Game for Foot Dorsiflexion and Plantarflexion Rehabilitation Exercise</strong></td>
<td>Hee, Cheok Lek <em>(Monash University Malaysia)</em>; Chong, Tüne Hau <em>(Monash University Malaysia)</em>; Gouwanda, Darwin* <em>(Monash University Malaysia)</em>; Gopalai, Alpha Agape <em>(Curtin University Sarawak Campus)</em>; Low, Cheng Yee <em>(Universiti Teknologi MARA)</em>; Hanapiah, Fazah Akhtar <em>(Universiti Teknologi Mara)</em></td>
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<td>14:50-15:05</td>
<td>WeBT12.3</td>
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<td><strong>Automatic Detection and Labeling of Self-Stimulatory Behavioral Patterns in Children with Autism Spectrum Disorder</strong></td>
<td>Min, Cheol-Hong* <em>(University of St. Thomas)</em></td>
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<td>15:05-15:20</td>
<td>WeBT12.4</td>
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<td><strong>Design of Focal Brain Cooling System for Suppressing Epileptic Seizures</strong></td>
<td>Hata, Kei <em>(Kyoto University)</em>; Fujiwara, Koichi* <em>(Kyoto University)</em>; Kano, Manabu <em>(Kyoto University)</em>; Inoue, Takao <em>(Yamaguchi University)</em>; Nomura, Sadahiro <em>(Yamaguchi University)</em>; Imoto, Hirochika <em>(Yamaguchi University)</em>; Suzuki, Michiyasu <em>(Yamaguchi University)</em></td>
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<td>15:20-15:35</td>
<td>WeBT12.5</td>
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<td><strong>Smartphone App to Investigate the Relationship between Social Connectivity and Mental Health</strong></td>
<td>Boonstra, Tjeerd W. <em>(University of New South Wales)</em>; Werner-Seidler, Aliza <em>(University of New South Wales)</em>; O’Dea, Bridianne <em>(University of New South Wales)</em>; Larsen, Mark Erik* <em>(University of New South Wales)</em>; Christensen, Helen <em>(University of New South Wales)</em></td>
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### WeBT13: 14:20-15:50
**Drug Delivery Routes, Release and Formulation (Oral Session)**

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<td>WeBT13.1</td>
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Myographic Signal Analysis I (Poster Session)

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Chen, XiaoBin (Southeast University); Zhou, Yuxuan (School of Basic Medical Science, Nanjing Medical University); Wang, Haipeng (Southeast University, Institute of RF- & OE-ICs); Lü, Xiaoying* (Southeast University); Wang, Zhigong (Southeast University)

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Saidane, Yosra* (SUP'COM); Ben Jebara, Sofia (SUP'COM)

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Tosin, Maurício C (UFRGS); Majolo, Mariano (UFRGS); Chedid, Raissan (UFRGS); Cene, Vinicius H. (UFRGS); Favieiro, Gabriela Winkler* (Federal University of Rio Grande do Sul (UFRGS)); Balbinot, Alexandre (Federal University of Rio Grande do Sul (UFRGS))

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Atri, Roozbeh* (Florida International University); Marquez, Juan S. (Florida International University); Bai, Ou (Florida International University)

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Greco, Alberto* (University of Pisa); Guidi, Andrea (University of Pisa); Felici, Federica (Istituto Italiano di Tecnologia); Leo, Andrea (IMT School for Advanced Studies); Ricciardi, Emiliano (University of Pisa); Bianchi, Matteo (University of Pisa); Bacchi, Antonio (University of Pisa); Citi, Luca (University of Essex); Valenza, Gaetano (University of Pisa); Scilingo, Enzo Pasquale (University of Pisa)

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Roland, Theresa* (Johannes Kepler University Linz); Baumgartner, Werner (Johannes Kepler University Linz); Amsuess, Sebastian (University Medical Center, Georg August University, Goettingen); Russold, Michael (Otto Bock Healthcare Products GmbH)
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Gautam, Arvind Kumar (IIT Hyderabad); Balouria, Anuradha (IIT Hyderabad); Acharyya, Amit* (Indian Institute of Technology Hyderabad); Acharyya, Swati Ghosh (UOH Hyderabad); Panwar, Madhuri (IIT Hyderabad); Naik, Ganesh R (University of Technology Sydney)

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Lee, Minji (Korea University); Sanders, Robert D. (University of Wisconsin); Yeom, Seul-Ki (Korea University); Won, Dong-Ok (Korea University); Kim, Hwi-Jae (Korea University); Lee, Bo-Ram (Korea University); Seo, Kwang-Suk (Seoul National University Dental Hospital); Kim, Hyun Jeong (Seoul National University Dental Hospital); Tononi, Giulio (University of Wisconsin); Lee, Seong-Whan* (Korea University)

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Walmer, Matthew (Johns Hopkins Univ.); Sklar, Samuel (Johns Hopkins Univ.); Sacré, Pierre (Johns Hopkins Univ.); Schevon, Catherine (Columbia Univ. Medical Center); Srinivasan, Shraddha (Columbia Univ. Medical Center); Banks, Garrett (Columbia Univ. Medical Center); Yates, Mark (Columbia Univ. Medical Center); McKhann, Guy (Columbia Univ. Medical Center); Sheth, Sameer (Columbia Univ. Medical Center); Sarma, Sridevi V. (Johns Hopkins Univ.); Smith, Elliot* (Columbia Univ. Medical Center)

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D’Alevo, Raina* (Johns Hopkins University); Rouse, Adam (University of Rochester Medical Center); Schieber, Marc (University of Rochester); Sarma, Sridevi V. (Johns Hopkins University)
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<td>Buccino, Alessio Paolo* (University of Oslo); Ness, Torbjørn V (Norwegian University of Life Sciences); Einovoll, Gaute (Norwegian University of Life Sciences); Cauwenberghs, Gert (University of California San Diego); Häfliger, Philipp (University of Oslo, Dept. of Informatics)</td>
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<td>Electro-Mechanical Response of a 3D Nerve Bundle Model to Mechanical Loads Leading to Axonal Injury</td>
<td>Cinelli, Ilaria* (NUI of Galway); Destrade, Michel (CNRS / Universite Pierre et Marie Curie); Duffy, Maeve (NUI Galway); McHugh, Peter (NUI of Galway)</td>
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<td>EEG Alpha Power Change during Working Memory Encoding in Adults with Different Memory Performance Levels</td>
<td>Wang, Ruimin* (Kyushu University); Kamezawa, Risako (Graduate School of Systems Life Sciences, Kyushu University); Watanabe, Aiko (Kyushu University); Iramina, Keiji (Kyushu University, Japan)</td>
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<td>Marjaninejad, Ali (University of Southern California); Taherian, Babak (University of Southern California); Valero-Cuevas, Francisco* (University of Southern California)</td>
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<td>Active Brainwave Pattern Generation for Brain-to-Machine Communication</td>
<td>Ganesh, Swathi (San Diego State Univ.); Timm, Dale (San Diego State Univ.); Moon, Kee* (San Diego State University); Lee, Sung Q (ETRI); Youm, Woosub (ETRI)</td>
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<td>An, Xingwei* (Tianjin University); Wei, Jinwen (Tianjin University); Liu, Shuang (Tianjin University); Ming, Dong (Tianjin University)</td>
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<td>The Effect of Semantic Congruence for Visual-Auditory Bimodal Stimuli</td>
<td>An, Xingwei* (Tianjin University); Cao, Yong (China Astronaut Research and Training Center); Wei, Jinwen (Tianjin University); Liu, Shuang (Tianjin University); Jiao, Xuejun (China Astronaut Research and Training Center); Ming, Dong (Tianjin University)</td>
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<td>A Brain Machine Interface for Command based Control of a Wheelchair using Conditioning of Oscillatory Brain Activity</td>
<td>Hamad, Eyad* (German Jordanian University); Al-Gharabli, Samer (Pharmaceutical and Chemical Engineering Dept., German Jorda); Saket, Munib (Pharmaceutical and Chemical Engineering Dept., German Jorda); Jubran, Omar (German Jordanian University)</td>
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<td>16:22-16:24</td>
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<td>A Hybrid BCI Web Browser based on EEG and EOG Signals</td>
<td>He, Shenghong (South China Univ. of Technology); Yu, Tianyou (South China Univ. of Technology, Chinese); Gu, Zhenghui (South China Univ. of Technology, China); Li, Yuanqing* (South China Univ. of Technology)</td>
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<td>A Real-Time Spike Sorting Method based on the Embedded GPU</td>
<td>Yang, Zelan (Zhejiang University); Zhang, Shaomin (Zhejiang University); Xu, Kedi (Zhejiang University, Qiushi Academy for Advanced Studies); Tian, Xiang* (Zhejiang University); Zheng, Xiaoxiang (Zhejiang University)</td>
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16:30-16:32 WeCT8-02.11
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Balaji, Advait* (BITS Pilani KK Birla Goa Campus); Haldar, Aparajita (Birla Institute of Technology and Science, Pilani, K K Birla Goa); Patil, Keshav (Birla Institute of Technology and Science, Pilani, K. K. Birla G); Thandayam, Sai Ruthvik (BITS Pilani KK Birla Goa Campus); C A, Valliappan (BITS Pilani KK Birla Goa Campus); Jartarkar, Mayur (Birla Institute of Technology and Science, Pilani, K. K. Birla G); Baths, Veeky (BITS Pilani KK Birla Goa Campus)

16:32-16:34 WeCT8-02.12
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16:12-16:14 WeCT8-03.2
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<td>Hao, Huaqing (Shanghai Jiao Tong University); Gu, Lin (Shanghai Ruijin Rehabilitation Hospital); Bao, Yong (Dept. of Rehabilitation Medicine, Ruijin Rehabilitation Hospital); Xie, Qing (Ruijin Hospital Shanghai Jiaotong University School of Medicine); Lan, Ning (Shanghai Jiao Tong University); Niu, Chuanxin M.* (Ruijin Hospital, School of Medicine, Shanghai Jiao Tong University)</td>
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<td>Murphy, Paige (University of Connecticut); von Paternos, Adam (University of Connecticut); Santaniello, Sabato* (University of Connecticut)</td>
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<td>Boehler, Christian* (University of Freiburg); Oberueber, Felix (University of Freiburg); Stieglitz, Thomas (University of Freiburg); Asplund, Maria (University of Freiburg)</td>
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<td>Higashi, Yuichiro (University of Hyogo); Yokota, Yusuke (National Institute of Information and Communications Technology); Naruse, Yasushi* (National Institute of Information and Communications Technology)</td>
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<td>Kiele, Patrick* (University of Freiburg); Čvančara, Paul (University of Freiburg); Mueller, Matthias (University of Freiburg); Stieglitz, Thomas (University of Freiburg)</td>
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<td>Zeng, Qi (Shenzhen Institutes of Advanced Technology, Chinese Academy of S); Xia, Kai (Shenzhen Institutes of Advanced Technology, Chinese Academy of S); Sun, Bin (Shenzhen Institutes of Advanced Technology, Chinese Academy of S); Wu, Tianzhun* (Shenzhen Institutes of Advanced Technology (SIAT), Chinese Acede); Humayun, Mark (University of Southern California)</td>
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<td>Tariq, Taimoor* (School of Electrical Engineering and Computer Science, National); Satti, Muhammad Hashim (School of Electrical Engineering and Computer Science, National); Saeed, Maryam (School of Electrical Engineering and Computer Science, National); Kamboh, Awais Mehmood (School of Electrical Engineering and Computer Science, National)</td>
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<td>Bentler, Christian* (Universität Freiburg); Stieglitz, Thomas (University of Freiburg)</td>
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Rong, Wei (Beijing Tsinghua Chang Gung Hospital, Tsinghua University); Cai, Xu (Dept. of Orthopedics, Beijing Tsinghua Chang Gung Hospital); Pan, Yongwei (Dept. of Orthopedics, Beijing Tsinghua Chang Gung Hospital); Song, Fei (Dept. of Orthopedics, Beijing Tsinghua Chang Gung Hospital); Zhao, Zhe (Dept. of Orthopedics, Beijing Tsinghua Chang Gung Hospital); Sun, Changjiao (Dept. of Orthopedics, Beijing Tsinghua Chang Gung Hospital); Xiao, Songhua* (Beijing Tsinghua Chang Gung Hospital, Tsinghua University)

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Park, Heejin (Gwangju Institute of Science and Technology); Kang, HeeKyung (Chonnam National University); Wang, Ming (Chonnam National University Hospital); Chung, Euiheon (Gwangju Institute of Science and Technology); Jo, Jihoon (Chonnam National University Medical School); Kim, Sohee* (Daegu Gyeongbuk Institute of Science and Technology (DGIST))

Localization of Ultrasound Waveform for Low Intensity Ultrasound-Induced Neuromodulation in a Mouse Model

Song, Kang-Il* (Korea Institute of Science and Technology); Lee, Seul (College of Dentistry, Kyung Hee Univ.); Park, Sunghee (Korea Institute of Science and Technology); Hwang, Dosik (Yonsei Univ.); Kim, Hyungmin (Korea Institute of Science and Technology); Youn, Inchan (Korea Institute of Science and Technology)

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Zhang, Yu (Chinese Academy of Sciences, Institutes of Electronics); Xu, Shengwei (Institute of Electronics, Chinese Academy of Science); Yang, Lili (University of Chinese Academy of Sciences); Xiao, Guilhua (University of Chinese Academy of Sciences); Zhang, Song (Institute of Electronics, Chinese Academy of Sciences); Gao, Fei (Chinese Academy of Sciences, Institutes of Electronics); Li, Ziyue (Chinese Academy of Sciences, Institutes of Electronics); Wang, Mixia (Institute of Electronics, Chinese Academy of Sciences); Song, Yilin (Institute of Electronics, Chinese Academy of Sciences); Cai, Xinxia* (Institute of Electronics, Chinese Academy of Sciences)

In-Vitro Validation of a Closed-Loop Optogenetic Stimulation Device

Edward, Epsy Shiny* (Deakin University); Kouzani, Abbas Z. (Deakin University)

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Kim, Euisun* (Georgia Institute of Technology); Ueda, Jun (Georgia Institute of Technology); Shinohara, Minoru (Georgia Institute of Technology)

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Lee, Sang Wook* (Catholic University of America); Vermillion, Billt (Catholic University of America); Sandri Heidner, Gustavo (The Catholic University of America)

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Kim, Hyeongbeom (Dankook Univ., Collage of Medicine, Dept. of Biomedical Engineer); Kim, Jong-Wan (Dankook Univ., Institute of Tissue Regeneration Engineering); Hyun, Jung Keun (Dankook University); Chung, Phil-Sang (Dankook Univ., Dept. of Otolaryngology, BLI Korea); Park, Ilyong* (Dankook Univ., Collage of Medicine, Dept. of Biomedical Engineer)

Motor Imagery Enhancement Paradigm using Moving Rubber Hand Illusion System

Song, Minsu (DGIST (Daegu Gyeongbuk Institute of Science and Technology)); Kim, Jonghyun* (Daegu Gyeongbuk Institute of Science and Technology (DGIST))

The Impact of an Anti-Gravity Treadmill (AlterG) Training on Walking Capacity and Corticospinal Tract Structure in Children with Cerebral Palsy

Azizi, Shahla (Dept. of Medical Physics and Biomedical Engineering); Marzbani, Hengameh (Tehran University of Medical Sciences); Raminfard, Samira (Dept. of Neuroscience and Addiction Studies, School of Adva); Moradi Birgani, Parmida (Tehran University of Medical Sciences); Rasooli, Amirhossein (Tehran University of Medical Sciences); Mirbagheri, Mehdi* (Northwestern University/RIC)
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Zhang, Cheng (Chinese Academy of Sciences, Beijing); Zhang, Guanghao (Institute of Electrical Engineering, Chinese Academy of Sciences); Wang, Aihua (Chinese Academy of Sciences); Wu, Changzhe (Chinese Academy of Sciences); Huo, Xiaolin* (Chinese Academy of Sciences)

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Kim, Jinuk (Handong Global University); Kim, Hyeonseok (Handong Global University); Kim, Jaehyo* (Handong Global University)

A Preliminary Study to Identify a Neurophysiological Correlate of Electroacoustic Pitch Matching in Cochlear Implant Users

Tan, Chin-Tuan* (University of Texas, Dallas)

Retinal Electrostimulation in Rats: Activation Thresholds from Superior Colliculus and Visual Cortex Recordings

Barriga-Rivera, Alejandro* (University of New South Wales); Guo, Tianruo (University of New South Wales); Morley, John William (University of Western Sydney); Lovell, Nigel H. (University of New South Wales); Suaning, Gregg (The University of Sydney)

Testing Stimulus Protocols in Retinal-Prosthesis Patients

Gonzalez Calle, Alejandra* (University of Southern California); Weiland, James (University of Michigan)

Identifying Personal Health Experience Tweets with Deep Neural Networks

Jiang, Keyuan* (Purdue Univ. Northwest); Gupta, Ravish (Purdue Univ. Northwest); Gupta, Matrika (Purdue Univ. Northwest); Calix, Ricardo (Purdue Univ. Northwest); Bernard, Gordon (Vanderbilt Univ. Medical Center)

Video Analysis of “YouTube Funnies” to Aid the Study of Human Gait and Falls – Preliminary Results and Proof of Concept

Taati, Babak* (Toronto Rehabilitation Institute and Univ. of Toronto); Lohia, Pranay (Indian Institute of Technology, Kharagpur); Mansfield, Avril (Toronto Rehabilitation Institute); Ashraf, Ahmed (Univ. of Toronto)

3-Year Risk Prediction of Coronary Heart Disease in Hypertension Patients: A Preliminary Study

Chen, Runge (Shenzhen Institute of Advanced Technology, Chinese Academy of Sc); Yang, Yujie (Shenzhen Institutes of Advanced Technology, Chinese Academy of S); Miao, Fen (Shenzhen Institutes of Advanced Technology, Chinese Academy of S); Cai, Yun-Peng (SIAT); Lin, Denan (Shenzhen Medical Information Center); Zheng, Jing (Shenzhen Medical Information Center); Li, Ye* (Shenzhen Institutes of Advanced Technology, Chinese Academy of S)

Prediction of Influenza a Virus Infections in Humans using an Artificial Neural Network Learning Approach

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Zaccaria, Gian Maria (Politecnico di Torino); Rosati, Samanta (Politecnico di Torino); Castagneri, Cristina (Politecnico di Torino); Ferrero, Simone (Università di Torino); Ladetto, Marco (Azienda Ospedaliera SS Antonio e Biagio e C.Arrigo, Alessandria); Boccardo, Mario (Università di Torino); Balestra, Gabriella* (Politecnico di Torino)

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Fast Segmentation and Modeling of Hepatic Components for the Planning of Robot-Assisted Liver Tumor Ablation
Zhou, Jiayin* (Institute for Infocomm Research); Chi, Yanling (Institute for Infocomm Research); Huang, Weimin (Institute for Infocomm Research, Agency for Science Technology and Research); Toe, Kyaw Kyar (Institute for Infocomm Research, A*STAR); Chui, Chee Kong (National University of Singapore); Chang, Stephen KY (National University of Singapore)

Cloud Solution for Histopathological Image Analysis using Region of Interest based Compression
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Ikhsan, Mohammad* (National University of Singapore); Tan, Kok Kiong (National University of Singapore); Putra, Andi Sudjana (National University of Singapore); Chew, Tsong Huey Sophia (Singapore General Hospital); Kong, Chee Fai (Singapore General Hospital)

16:26-16:28 WeCT14-01.9
GPU-Based Computation for Brain Spatio-Temporal Networks Definition
Purgato, Andrea* (Politecnico di Milano); Reggiani, Enrico (Politecnico di Milano); D'Arnese, Eleonora (Politecnico di Milano); Berger-Wolf, Tanya (University of Illinois at Chicago); Grimaldi, Marco (Neurocenter Humanitas Research Hospital); Durelli, Gianluca Carlo (Politecnico di Milano); Santambrogio, Marco (Politecnico di Milano)

WeCT14-02: 16:10-17:10 Schaldach Room
Optical Imaging III (Poster Session)

16:10-16:12 WeCT14-02.1
Automatic Detection of Hyperreflective Foci in Optical Coherence Tomography B-Scans using Morphological Component Analysis
Rabbani, Hossein* (Isfahan Univ. of Medica Sciences); Ghasemi Kamasi, Zeinab (West Virginia University); Mokhtary, Marzieh (Isfahan University of Medical Sciences)

16:12-16:14 WeCT14-02.2
Fibroatheroma Identification in Intravascular Optical Coherence Tomography Images using Deep Features
Xu, Mengdi* (Institute for Infocomm Research); Cheng, Jun (Institute for Infocomm Research, AStar); Li, Annan (Institute for Infocomm Research, ASTAR); Lee, Jimmy Addison (Institute for Infocomm Research, ASTAR); Wong, Damon (Institute for Infocomm Research); Tanaka, Atsushi (Wakayama Medical University); Foin, Nicolas (National Heart Centre Singapore); Wong, Philip (National Heart Centre Singapore)

16:14-16:16 WeCT14-02.3
Exact Localization of Breakpoints of Retinal Pigment Epithelium in Optical Coherence Tomography of Optic Nerve Head
Mokhtary, Marzieh (Isfahan University of Medical Sciences); Rabbani, Hossein* (Isfahan Univ. of Medica Sciences); Mehr Dehnavi, Alireza (Isfahan University of Medical Sciences, School of Advanced Techn); Kafieh, Rahele (Isfahan University of Medical Sciences)

16:16-16:18 WeCT14-02.4
The Analysis of Eye Blinking Pattern using High-Frame-Rate Camera
Lee, Woon-Hee (Seoul National University); Seo, Jong Mo* (Seoul National University, School of Engineering); Hwang, Jeong Min (Seoul National University School of Medicine)
### Blood Oxygenation Changes Resulting from Subthreshold High Frequency Repetitive Transcranial Magnetic Stimulation

Li, Rihui (Year); Wang, Chushan (Guangdong Provincial Work-injury Rehab. Hospital); Huang, Kairong (Guangdong Provincial Work-injury Rehab. Hospital); Shi, Zhixi (Guangdong Provincial Work-injury Rehab. Hospital); Wang, Jun (Guangdong Provincial Work-injury Rehab. Hospital); Zhang, Y.* (Univ. of Houston)

16:20-16:22 WeCT14-02.6

Recognition of Protozoan Parasites from Microscopic Images: Eimeria Species in Chickens and Rabbits as a Case Study

Abdalla, Mohamed A E (Northumbria University); Seker, Huseyin* (The University of Northumbria at Newcastle)

### Respiratory Systems I (Poster Session)

16:10-17:10 Webster Room

Development and Validation of a Computational Simulator for Pediatric Acute Respiratory Distress Syndrome Patients

Saffaran, Sina (The University of Warwick); Das, Anup (University of Warwick); Hardman, Jonathan G. (University of Nottingham); Yehya, Nadir (Children’s Hospital of Philadelphia); Bates, Declan Gerard* (University of Warwick)

16:10-16:12 WeCT15-01.1

Nonparametric Modelling of VO2 Response to Exercise

Ye, Lin* (Univ. of Technology, Sydney (UTS)); Argha, Ahmadreza (Univ. of New South Wales); Celler, Branko George (Univ. of New South Wales); Zhang, Yi (Univ. of Electronic Science and Technology of China); Nguyen, Hung T. (Univ. of Technology, Sydney); Su, Steven Weidong (Univ. of Technology, Sydney)

16:14-16:16 WeCT15-01.3

Development of a Real-Time Breathing-Rate Monitor using Difference Operation Method and Adaptive Windowing on ECG Signal

Singh, Rahul Kumar* (IIT Kharagpur); Negi, Shubham (IIT Kharagpur); Chandrika Sreekantan, Anoop (Indian Institute of Space Science and Technology Trivandrum)

### Sleep Apnea I (Poster Session)

16:10-17:10 Webster Room

Monitoring of Nocturnal Central Sleep Apnea in Heart Failure Patients using Noncontact Respiratory Differences

Armitstead, Jeffrey Peter* (Res Med Ltd., University of Sydney); Khushaba, Rami N. (University of Technology, Sydney (UTS)); Schindhelm, Klaus (University of New South Wales)

16:12-16:14 WeCT15-02.2

Relationship between Heart Rate Excursion and Apnea Duration in Patients with Obstructive Sleep Apnea

Solá-Soler, Jordi* (Univ. Politècnica de Catalunya); Giraldo, Beatriz (Univ. Politècnica de Catalunya); Fiz Fernandez, José Antonio (Navarra Hospital); Jané, Raimon (Institute for Bioengineering de Catalunya (IBEC))

16:14-16:16 WeCT15-02.3

Characterization of a Tooth Microphone Coupled to an Oral Appliance Device: A New System for Monitoring OSA Patients

Castillo, Yolanda (Institute for Bioengineering of Catalonia (IBEC)); Blanco-Almazán, Dolores (Institute for Bioengineering of Catalonia); Whitney, James (Morgan State University); Mersky, Barry (Audiodontics); Jané, Raimon* (Institute for Bioengineering de Catalunya (IBEC))

16:16-16:18 WeCT15-02.4

Characterization of Microphones for Snoring and Breathing Events Analysis in Mhealth

Castillo, Yolanda (Institute for Bioengineering of Catalonia (IBEC)); Cámara, Miguel Ángel (Institute for Bioengineering of Catalonia); Blanco-Almazán, Dolores (Institute for Bioengineering of Catalonia); Jané, Raimon* (Institute for Bioengineering de Catalunya (IBEC))
Sleep Apnoea Diagnosis using Respiratory Effort-Based Signals – A Comparative Study
Sadr, Nadi* (University of Sydney); Jayawardhana, Madhuka (University of Sydney); de Chazal, Philip (University of Sydney)

Mhealth Tools for Monitoring Obstructive Sleep Apnea Patients at Home: Proof-of-Concept
Cámara, Miguel Ángel (Inst. for Bioengineering of Catalonia); Castillo Escario, Yolanda (Inst. for Bioengineering of Catalonia (IBEC)); Blanco-Almazán, Dolores (Inst. for Bioengineering of Catalonia); Estrada, Luis (Inst. for Bioengineering de Catalunya); Jané, Raimon* (Inst. for Bioengineering de Catalunya (IBEC))

Thursday, 13 July 2017

ThAT1: 08:00-09:30
Brain and Physiological Networks: Methods and Applications (Invited Session)
Chair: Faes, Luca (University of Trento)
Co-Chair: Ding, Lei (University of Oklahoma)

08:00-08:15
Causal Brain-Heart Information Transfer during Visual Emotional Elicitation in Healthy Subjects: Preliminary Evaluations and Future Perspectives
Faes, Luca (Univ. of Trento); Greco, Alberto (Univ. of Pisa); Lanata*, Antonio (Univ. of Pisa); Barbieri, Riccardo (Politecnico di Milano); Scilingo, Enzo Pasquale (Univ. of Pisa); Valenza, Gaetano* (Univ. of Pisa)

08:15-08:30
Information Transfer and Information Modification to Identify the Structure of Cardiovascular Networks
Faes, Luca* (University of Trento); Nollo, Giandomenico (University of Trento); Krohova, Jana (Comenius University in Bratislava); Czippelova, Barbora (Dept. of Physiology, Comenius University, Jessenius Faculty); Turianikova, Zuzana (Dept. of Physiology, Comenius University, Jessenius Faculty); Javorka, Michal (Comenius University, Jessenius Faculty of Medicine)

09:15-09:30
Functional Connectivity Analysis of Multiplex Muscle Network across Frequencies
Kerkman, Jennifer N.* (Vrije Universiteit Amsterdam); Daffertshofer, Andreas (Vrije Universiteit Amsterdam); Gollo, Leonardo (QIMR Berghofer Medical Research Institute); Breakspear, Michael (QIMR Berghofer Medical Research Institute); Boonstra, Tjeerd W. (University of New South Wales)

ThAT4: 08:00-09:30
New Sensing Techniques I (Oral Session)
Chair: Scilingo, Enzo Pasquale (University of Pisa)

08:00-08:15
A New Hand Function Assessment Method using an Infrared Imaging Device
Fang, Qiang* (RMIT University); Gu, Xudong (The 2nd hospital of Jiaxing)

08:15-08:30
Frequency-Range Optimized Preprocessing Methods for Quantitative Analysis of Glucose in Blood Serum from Broadband Dielectric Spectra
Wang, Rui (NTT Device Technology Labs.); Nakamura, Masahito* (NTT Corporation); Tanaka, Yujiro (NTT Device Technology Labs.); Tajima, Takuro (NTT Device Technology Laboratories)

08:30-08:45
Three-Dimensional Electrodes Formation using Liquid Metal in Micro Channels for 3-Axis Capacitive Force Sensor
Tatsuho, Nagatomo* (Keio University); Miki, Norhisa (University)

08:45-09:00
Monitoring Voluntary Blink Magnitude through a Wearable Eye-Tracking System: A Preliminary Study
Lanata*, Antonio (University of Pisa); Guidi, Andrea (University of Pisa); Greco, Alberto (University of Pisa); Valenza, Gaetano (University of Pisa); Scilingo, Enzo Pasquale* (University of Pisa)
09:00-09:15  
**Can Accelerometry Data Improve Estimates of Heart Rate Variability from Wrist PPG Sensors?** ............... 1587-1590  
Kos, Maciej Rafal* (Northeastern University); Li, Xuan (Northeastern University); Khaghani-Far, Iman (Northeastern University); Gordon, Christine (Northeastern University); Pavel, Misha (Northeastern University); Jimison, Holly (Northeastern University)

09:15-09:30  
**Flexible Sensor Sheet for Real-Time Pressure Monitoring in Artificial Knee Joint during Total Knee Arthroplasty** ................................................................. 1591-1594  
Tanabe, Fumika* (Osaka University); Yoshimoto, Shusuke (Osaka University); Noda, Yuki (Osaka University); Araki, Teppei (Osaka University); Uemura, Takaumi (Osaka University); Takeuchi, Yoshinori (Osaka University); Imai, Masaharu (Osaka University); Sekitani, Tsuyoshi (Osaka University)

**Biomaterial Cell Interaction and Bioprinting** (Oral Session)  
Zworykin Room

08:00-08:15  
**Micro-Patterned Films of Bio-Functionalized Conducting Polymers for Cellular Engineering** ............... 1595-1598  
Park, SooHyun (Penn State University); Abidian, Mohammad Reza (University of Houston); Majd, Sheereen* (University of Houston)

08:15-08:30  
**Visible Light-Based Stereolithography Bioprinting of Cell-Adhesive Gelatin Hydrogels** .................................................. 1599-1602  
Wang, Zongjie (Univ. of British Columbia); Tian, Zhenlin (Univ. of British Columbia); Jin, Xian (Univ. of British Columbia); Holzman, Jonathan (Univ. of British Columbia); Menard, Frederic (Univ. of British Columbia); Kim, Keekyoung* (Univ. of British Columbia Okanagan Campus)

08:30-08:45  
**Manual Centrifuge System: Bearing-Based Hand Spinner Made with 3-D Printer** ........................................ 1603-1606  
Yoo, Sunyoung (Seoul National University); Lee, Seung Jae (Seoul National University); Seo, Jong Mo* (Seoul National University, School of Engineering)

08:45-09:00  
**Directed Cell Migration in Co-Cultures by Topographic Curvature for Heterogeneous Tissue Engineering** ........ 1607-1610  
Okutani, Chihiro* (University of Tokyo); Wagatsuma, Akira (University of Tokyo); Mabuchi, Kunihiko (The University of Tokyo); Hoshino, Takayuki (University of Tokyo)

09:00-09:15  
**Development of Biomimetic System for Scale Up of Cell Spheroids – Building Blocks for Cell Transplantation** .................................................. 1611-1616  
Baba, Kazutomo* (University of Tsukuba); Sankai, Yoshiyuki (University of Tsukuba)

09:15-09:30  
**Enabling 3D Hepatocyte Spheroids for Microphysiometry** ................................................................. 1617-1620  
Eggert, Sebastian* (cellasys GmbH); Alexander, Frank (cellasys GmbH); Wiest, Joachim (cellasys GmbH)

**Joint Mechanics** (Oral Session)  
Herrick Room

08:00-08:15  
**Gender Difference of Ankle Stability in the Sagittal and Frontal Planes** .................................................. 1621-1624  
Lee, Hyunglae* (Arizona State University); Hanzlick, Harrison (Arizona State University)

08:15-08:30  
**Effects of Counteracting External Valgus Moment on Lateral Tibial Cartilage** ........................................ 1625-1628  
Shriram, Duraisamy* (Singapore University of Technology and Design); Parween, Rizuwana (Singapore University of Technology and Design); Lee, Yee Han Dave (Changi General Hospital Singapore); Karupppasamy, Subburaj (Singapore University of Technology and Design (SUTD))
Assessment of 3D Morphological Characteristics of the Shoulder Bones using Statistical Shape Modeling: An Application to Handedness

Inyang, Adijat Omowumi (University of Cape Town); Fouefack, Jean-Rassaire (University of Cape Town); Sivarasu, Sudesh (University of Cape Town); Roche, Stephen (University of Cape Town); Borotikar, Bhushan (IMT Atlantique); Burdin, Valerie (IMT Atlantique/Institut Mines Telecom - INSERM U1101); Mutsvangwa, Tinashe Ernest Muzvidzwa (University of Cape Town)

The use of Shear Thickening Polymer as a Hip Protector

Lee, Taeyong (Ewha Womans University); Hwang, Dong-Gyu (Ewha Womans University); Ogihara, Naomichi (Keio University); Ito, Kohta (Keio University)

Risk Estimation for Intervertebral Disc Pressure through Musculoskeletal Joint Reaction Force Simulation

Imamura, Yumeko (The National Institute of Advanced Industrial Science and Technology); Ayusawa, Ko (National Institute of Advanced Industrial Science and Technology); Yoshida, Eiichi (National Institute of Advanced Industrial Science and Technology)

Subject-Specific Shoulder Muscle Attachment Region Prediction using Statistical Shape Models: A Validity Study

Salhi, Asma (IMT Atlantique); Burdin, Valerie (IMT Atlantique/Institut Mines Telecom - INSERM U1101); Mutsvangwa, Tinashe Ernest Muzvidzwa (University of Cape Town); Sivarasu, Sudesh (University of Cape Town); Brochard, Sylvain (CHRU Brest); Borotikar, Bhushan (IMT Atlantique)

Neural Decoding of Attentional Selection in Multi-Speaker Environments without Access to Separated Sources

O'Sullivan, James (Columbia University); Chen, Zhuo (Columbia University); Herrero, Jose (Feinstein Institute for Medical Research); Sheth, Sameer (Columbia University Medical Center); McKhann, Guy (Columbia University Medical Center); Mehta, Ashesh (Feinstein Institute for Medical Research); Mesgarani, Nima (Columbia University)

TrueNorth-Enabled Real-Time Classification of EEG Data for Brain-Computer Interfacing

Kiral-Kornek, Filiz Isabell (University of Melbourne); Mendis, Dulini (University of Melbourne); Nurse, Ewan (University of Melbourne); Mashford, Benjamin Scott (IBM Research Australia); Freestoned, Dean Robert (The University of Melbourne); Grayden, David B. (The University of Melbourne); Harrer, Stefan (IBM Research)

An Eighty-Target High-Speed Chinese BCI Speller

Han, Chengcheng (Xi'an Jiaotong University); Xu, Guanghua (Xi'an Jiaotong University); Xie, Jun (Xi'an Jiaotong University); Li, Min (School of Mechanical Engineering, Xi'an Jiaotong University); Zhang, Sicong (Xi'an Jiaotong University); Luo, Ailing (Xi'an Jiaotong University)

Cortical Oscillatory Dynamics of Tactile Selective Sensation – For a Novel Type of Somatosensory Brain-Computer Interface

Yao, Lin (University Medical Center Goettingen, Georg-August-University); Chen, Mei Lin (University of Waterloo); Sheng, Xinjun (Shanghai Jiao Tong University); Mrachacz-Kersting, Natalie (Aalborg University); Zhu, Xiangyang (Shanghai Jiao Tong University); Farina, Dario (Bernstein Center for Computational Neuroscience, University Medi); Jiang, Ning (University of Waterloo)
Dynamic Tracking of Non-Stationarity in Human ECoG Activity
Yang, Yuxiao* (University of Southern California); Chang, Edward (UCSF); Shanechi, Maryam (University of Southern California)

Movement-Related Brain Oscillations Vary with Lesion Location in Severely Paralyzed Chronic Stroke Patients
Ray, Andreas Markus* (Tuebingen University); López-Larraz, Eduardo (University of Tübingen); da Cruz Figueiredo, Thiago (University of Tübingen); Birbaumer, Niels (Eberhard-Karls-University); Ramos-Murgualday, Ander (Eberhard Karls University of Tubingen/TECNALIA)

Prediction of Adenocarcinoma Development using Game Theory
Athreya, Arjun* (University of Illinois at Urbana-Champaign); Armstrong, Don (University of Illinois at Urbana Champaign); Gundling, William (Dept. of Molecular and Integrative Physiology, University); Wildman, Derek (University of Illinois); Kalbarcy, Zbigniew (University of Illinois at Urbana-Champaign); Iyer, Ravishankar (University of Illinois at Urbana-Champaign)

Learning from Different Perspectives: Robust Cardiac Arrest Prediction via Temporal Transfer Learning
Ho, Joyce C.* (Emory University); Park, Yubin (The University of Texas at Austin)

Predictive Modeling for Corrective Maintenance of Imaging Devices from Machine Logs
Balasheb Patil, Ravindra* (Philips Research India); Patil, Meru (Philips India Limited); Ravi, Vidya (Philips); Naik, Sarif Kumar (Philips Electronics India Ltd)

Data-Driven Strategies for Robust Forecast of Continuous Glucose Monitoring Time-Series
Fiorini, Samuele* (University of Genoa); Martini, Chiara (University of Genoa); Malpassi, Davide (University of Genoa); Cordera, Renzo (University of Genoa); Maggi, Davide (University of Genoa); Verri, Alessandro (University of Genoa); Barla, Annalisa (University of Genoa)

Prediction of Temperature Induced Office Worker's Performance during Typing Task using EEG
Nayak, Tapsya (Univ. of Texas at San Antonio); Zhang, Tingle (Univ. of Texas, San Antonio); Mao, Zijing (Univ. of Texas at San Antonio); Xu, Xiaojing (Univ. of Tennessee, Knoxville); Pack, Daniel (Univ. of Tennessee); Dong, Bing (Univ. of Texas, San Antonio); Huang, Yufei* (Univ. of Texas at San Antonio)

Consensus Motifs as Adaptive and Efficient Predictors for Acute Hypotensive Episodes
Pathinarupothi, Rahul Krishnan (Amrita Vishwa Vidyapeetham); Rangan, Ekanath* (Amrita Vishwa Vidyapeetham)

Model-Based Estimation of Radial Artery Blood Pressure from Recordings of the Nexfin Monitor
Imaduddin, Syed (Massachusetts Institute of Tech.); Heldt, Thomas* (Massachusetts Institute of Tech.)
A Simple Method for Reconstruction of Continuous Brachial Artery Pressure from Continuous Digital Artery Pressure in Humans

Zhang, Pandeng* (Chinese Academy of Sciences); Qiu, Quanli (SIAT); Luo, Ying (Shenzhen sun yat-sen cardiovascular hospital); Zhou, Yanxia (Shenzhen Municipal Second People’s Hospital, Guangdong Pro); Liu, Jia (Chinese Academy of Sciences)

Measurement of Carotid Blood Pressure and Local Pulse Wave Velocity Changes during Cuff Induced Hyperemia

PM, Nabeel* (Indian Institute of Tech. Madras); Karthik, Srinivasa (HTIC IIT Madras); Joseph, Jayaraj (HTIC, Indian Institute of Tech. Madras); Sivaprasakasam, Mohanasankar (Indian Institute of Tech. Madras)

Analysis of a GMR-Based Plethysmograph Transducer and Its Utility for Real-Time Blood Pressure Measurement

Chugh, Vinit Kumar* (IIT Kharagpur); Kalyan, Kuber (IIT Kharagpur); Chandrika Sreekantan, Anoop (Indian Institute of Space Science and Technology Trivandrum); Patra, Amit (Indian Institute of Technology Kharagpur); Negi, Shubham (IIT Kharagpur)

Regression Analysis and Transfer Function in Estimating the Parameters of Central Pulse Waves from Brachial Pulse Wave

Chai, Rui (Northeastern University); Li, Siman (Northeastern University); Xu, Lisheng* (Northeastern University); Yao, Yang (Northeastern University); Hao, Liling (Northeastern University)

Novel Blood Pressure Estimation Method using Single Photoplethysmography Feature

Chen, Yang (Harbin Institute of Technology Shenzhen Graduate School); Cheng, Shuo (Harbin Institute of Technology); Wang, Tong (Harbin Institute of Technology, Shenzhen Graduate School); Ma, Heather Ting* (Harbin Institute of Technology Shenzhen Graduate School)

Chronic Multi-Region Recordings from the Rat Hippocampus in Vivo with a Flexible Parylene-Based Multi-Electrode Array

Xu, Huijing* (University of Southern California); Meng, Ellis (University of Southern California); Berger, Theodore (University of Southern California); Song, Dong (University of Southern California)

Development and Characterization of a Fully Flexible Stimulation System based on Embedded Liquid Metal Channels

David, Romain* (Keio University); Miki, Norihisa (University)

Using Impedance to Track Fracture Healing Rates in Mice in Vivo: A Pilot Study

Lin, Monica* (UC Berkeley / UC San Francisco); Hu, Diane (Univ. of California - San Francisco); Yang, Frank (Univ. of California - San Francisco); Herfat, Safa (Univ. of California, San Francisco); Bahney, Chelsea (Univ. of California, San Francisco); Marmor, Meir (Univ. of California, San Francisco); Maharbiz, Michel (Univ. of California, Berkeley)

Effect of Temperature Variation on Remote Pressure Readout in Wirelessly Powered Intracranial Pressure Monitoring System

Khan, Muhammad Waqas Ahmad (Tampere University of Technology); Rizwan, Muhammad (Tampere University of Technology, Finland); Sydänheimio, Lauri (Tampere University of Technology); Ratmat-Samii, Yahya (University of California, Los Angeles); Ukkonen, Leena (Tampere University of Technology); Bjorninen, Toni* (Tampere University of Technology)
Implantable Bladder Volume Sensor based on Resistor Ladder Network Composed of Conductive Hydrogel Composite
Kim, Mi Kyung* (Korea Advanced Institute of Science and Technology (KAIST)); Kim, Hyojung (Korea Advanced Institute of Science and Technology); Jung, Yeon Su (KAIST); AlAdem, Kenana (Khalifa University); Bawazir, Sarah (Khalifa University); Stefanini, Cesare (Scuola Superiore Sant'Anna); Lee, Hyunjoo Jenny (Korea Advanced Institute of Science and Technology (KAIST))

Integrating Coupled Magnetoelastic Sensors onto a Flexible Hernia Mesh for High Dynamic Range Strain Measurements
Liao, Amy* (UC Berkeley); Harris, Hobart (UCSF); Maharbiz, Michel (University of California, Berkeley)

Machine Learning in Imaging I (Oral Session)
Chair: Ye, Jong Chul (Korea Advanced Inst of Science and Tech)

Abnormality Detection of Mammograms by Discriminative Dictionary Learning on DSIFT Descriptors
Tavakoli, Nasrin (Isfahan University of Technology); Karimi, Maryam (Isfahan University of Technology); Nejati, Mansour (Isfahan University of Technology); Karimi, Nader (Isfahan University of Technology); Soroushmehr, S.M.Reza* (University of Michigan, Ann Arbor); Samavi, Shadrokh (McMaster University); Najarian, Kayvan (University of Michigan - Ann Arbor)

Exudate Detection for Diabetic Retinopathy with Convolutional Neural Networks
Yu, Shuang (Commonwealth Scientific and Industrial Research Organization); Xiao, Di* (Commonwealth Scientific and Industrial Research Organization); Kanagasingam, Yogi (The Australian eHealth Research Centre, Perth, CSIRO.)

CEUS-Based Classification of Liver Tumors with Deep Canonical Correlation Analysis and Multi-Kernel Learning
Lehang, Guo (Shanghai Tenth People’s Hospital); Dan, Wang* (Shanghai Tenth People’s Hospital); Huixiong, Xu (Shanghai Tenth People’s Hospital); Yiyi, Qian (Shanghai University); Chaofeng, Wang (Shanghai University); Zheng, Xiao (Shanghai University); Zhang, Qi (Shanghai University); Shi, Jun (Shanghai University)

A Multi-View Deep Convolutional Neural Networks for Lung Nodule Segmentation
Wang, Shuo (Chinese Academy of Sciences); Mu, Zhou (Stanford University); Gevaert, Olivier (The Stanford Center for Biomedical Informatics Research, Stanford); Tang, Zhenchao (Shandong University, Weihai); Dong, Di (Chinese Academy of Sciences); Liu, Zhenyu (Institute of Automation, Chinese Academy of Sciences); Tian, Jie* (Chinese Academy of Sciences)

Surgical-Tools Detection based on Convolutional Neural Network in Laparoscopic Robot-Assisted Surgery
Choi, Bareum (Asan Institute for Life Sciences, Asan Medical Center); Jo, Kyungmin (Asan Institute for Life Sciences, Asan Medical Center); Choi, Song (Asan Institute for Life Sciences, Asan Medical Center); Choi, Jaesoon* (Asan Institute for Life Sciences, Asan Medical Center)

Deep Learning-Based Diabetic Retinopathy Assessment on Embedded System
Ardiyanto, Igi* (Universitas Gadjah Mada); Adi Nugroho, Hanung (Universitas Gadjah Mada); Buana, Ratna Lestari Budiani (Universitas Gadjah Mada)
### Bioengineering Advances in the Diagnosis and Treatment of Sleep Apnea I (Minisymposium)

**Chair:** Khoo, Michael (University of Southern California)
**Co-Chair:** Penzel, Thomas (Charite Universitätsmedizin Berlin)

**08:00-08:15**

**Development of Methods for Sleep Disordered Breathing to Identify Phenotypes**

Penzel, Thomas* (Charite Universitätsmedizin Berlin); Schoebel, Christoph (Charite Universitätsmedizin Berlin); Glos, Martin (Charite-Universitätsmedizin Berlin); Schwarz, Lisa (Charite - Universitätsmedizin Berlin); Prochnow, Lisa (Charite - Universitätsmedizin Berlin); Fietze, Ingo (Charite-Universitasmedizin Berlin)

**08:15-08:30**

**Estimation of Blood Pressure from Non-Invasive Data**

Shukla, Satya Narayan* (University of Massachusetts Amherst)

**08:30-08:45**

**Assessment of Instantaneous Cardiovascular Dynamics from Video Plethysmography**

Valenza, Gaetano (University of Pisa); Iozzia, Luca (Politecnico di Milano); Cerina, Luca (Politecnico di Milano); Mainardi, Luca (Politecnico di Milano); Barbieri, Riccardo* (Politecnico di Milano)

**08:45-09:00**

**Towards VO2 Monitoring: Validation of a Heart Rate based Algorithm**

Manzoni, Cecilia (EPFL); Carrard, Apolline (VO2Sport); Fontana, Elisa (VO2Sport); Lemay, Mathieu (CSEM); Bertschi, Mattia (CSEM); Delgado-Gonzalo, Ricard* (CSEM)

**09:00-09:15**

**A Portable Platform to Collect and Review Behavioral Data Simultaneously with Neurophysiological Signals**

Jiang, Tianxiao* (Univ. of Houston); Siddiqui, Hasan (Univ. of Houston); Ray, Shruti (Univ. of Houston); Ince, Nuri Firat (Univ. of Houston); Ozturk, Musa (Univ. of Houston); Asman, Priscella (Univ. of Houston)

### Signal Processing – Wearable Devices (Oral Session)

**Chair:** Barbieri, Riccardo (Politecnico di Milano)

**08:00-08:15**

**Remote Gaze Tracking System for 3D Environments**

Liu, Congcong* (Hong Kong University of Science and Technology); Herrup, Karl (Hong Kong University of Science and Technology); Shi, Bertram E (Hong Kong University of Science and Technology)

**08:15-08:30**

**Estimation of Blood Pressure from Non-Invasive Data**

Shukla, Satya Narayan* (University of Massachusetts Amherst)

**08:30-08:45**

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### Principal and Independent Component Analysis I (Oral Session)

**08:00-08:15**

**On the use of Higher-Order Tensors to Model Muscle Synergies**

Ebied, Ahmed* (University of Edinburgh); Spyrou, Loukianos (University of Edinburgh); Kinney-Lang, Eli (University of Edinburgh); Escudero, Javier (University of Edinburgh)

**08:15-08:30**

**Exploring Optimal Myoelectric Feature Indices for Forearm Control Strategy using Robust Principal Component Analysis**

Kanoga, Suguru* (National Institute of Advanced Industrial Science and Technology); Murai, Akihiko (National Institute of Advanced Industrial Science and Technology); Tada, Mitsunori (National Institute of Advanced Industrial Science and Technology)
08:30-08:45
**Coupling Scatter Correction with Bandpass Filtering for Pre-Processing in the Quantitative Analysis of Glucose from Near-Infrared Spectra** .................................................................................................................. 1800-1803
Alrezj, Osamah* (Sheffield University); Patchava, Krishna Chaitanya (The University of Sheffield); Benaisssa, Mohammed (The University of Sheffield); Alshebeili, Saleh (KSU)

08:45-09:00
**Modified Thresholding Technique of MMSPCA for Extracting Respiratory Activity from Short Length PPG Signal** .......................................................................................................................... 1804-1807
Motin, Mohammad Abdul (PhD Student, University of Melbourne); Karmakar, Chandan* (Deakin University); Palaniswami, Marimuthu (University of Melbourne)

09:00-09:15
**Channels Selection using Independent Component Analysis and Scalp Map Projection for EEG-Based Driver Fatigue Classification** .................................................................................................................. 1808-1811
Chai, Rifai* (University of Technology, Sydney); Naik, Ganesh R (University of Technology Sydney); Ling, Steve (University of Technology Sydney); Tran, Yvonne (University of Technology, Sydney); Craig, Ashley (The University of Sydney); Nguyen, Hung T. (University of Technology, Sydney)

09:15-09:30
**Motion Artifact Reduction in PPG Signals based on Periodic Component Factorization** .......................................................................................................................... 1812-1815
Lo, Po Wen* (The Chinese Univ. of Hong Kong); Li, Charles X.-T. (The Chinese Univ. of Hong Kong); Wang, Jiankun (The Chinese Univ. of Hong Kong); Meng, Max Q.-H. (The Chinese Univ. of Hong Kong)

**ThBT3: 10:50-12:20**
**Park Room**

**X-Ray and CT Imaging I** (Oral Session)
**Chair:** Moratal, David (Universitat Politècnica de València)

10:50-11:05
**Interactive Patient-Specific 3D Approximation of Scapula Bone Shape from 2D X-Ray Images using Landmark-Constrained Statistical Shape Model Fitting** .................................................................................................. 1816-1819
Mutsvangwa, Tinashe Ernest Muzvidzwa* (University of Cape Town); Wasswa, William (Mbarara University of Technology); Burdin, Valérie (Institut Telecom/Telecom Bretagne - INSERM U650); Borotikar, Bhushan (IMT Atlantique); Douglas, Tania S (University of Cape Town)

11:05-11:20
**Arytenoid Cartilage Feature Point Detection using Laryngeal 3D CT Images in Parkinson's Disease** .......................................................................................................................... 1820-1823
Desai, Nandakishor* (University of Melbourne); Rao, Aravinda (The University of Melbourne); Palaniswami, Paari (Monash University); Thyagarajan, Dominic (Monash Medical Centre); Palaniswami, Marimuthu (The University of Melbourne)

11:20-11:35
**Multiple Mucociliary Transit Marker Tracking in Synchrotron X-Ray Images using the Global nearest Neighbor Method** ........................................................................................................... 1824-1827
Jung, Hye-Won* (UNISA); Lee, Ivan (The University of South Australia); Lee, Sang-Heon (The University of South Australia); Parsons, David (Women's and Children's Hospital); Donnelley, Martin (University of Adelaide, Women's and Children's Hospital)

11:35-11:50
**A One-Dimensional Fluid Simulation Method of the Narrow Vessel for the Real-Time Angiography Simulation** .................................................................................................................. 1828-1831
Lee, Jongbeom (KAIST (Korea Advanced Institute of Science and Technology)); Kim, Myeongjin (KAIST (Korea Advanced Institute of Science and Technology)); Lee, Doo Yong* (KAIST)

11:50-12:05
**The use of Subject-Specific Finite Element Analysis of L1-L4 Vertebra to Screening Osteoporosis in Postmenopausal Women** ........................................................................................................... 1832-1835
Alacreu, Elena (Center for Biomaterials and Tissue Engineering, Universitat Poli); Arana, Estanislao (Radiology Dept., Fundación Instituto Valenciano de Oncologi); Moratal, David* (Universitat Politècnica de València)
### ThBT3.6
**Environment Effects at Phantom-Based X-Ray Pose Measurements**

Thuerauf, Sabine* (fortiss GmbH An-Institut Technische Universität München Mailing); Koerner, Mario (Siemens Healthcare GmbH); Vogt, Florian (Siemens Healthcare GmbH); Hornung, Oliver (Siemens Healthcare GmbH); Nasseri, M. Ali (Technische Universität München); Knoll, Alois (Technical University Munich)

**Abstract**

12:05-12:20

### ThBT4: 10:50-12:20

#### Min Room

**New Sensing Techniques II (Oral Session)**

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<td>Development of an Intraluminal Intestinal Photoplethysmography Sensor</td>
<td>Patel, Zaiba* (City, University of London); Thaha, Mohamed (The Royal London Hospital, Bart's Health NHS Trust); Kyriacou, Panayiotis (City University London)</td>
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<td>11:05-11:20</td>
<td>Instrumentation, Electrode Choice and Challenges in Human Skin Memristor Measurement</td>
<td>Pabst, Oliver* (Univ. of Oslo); Tronstad, Christian (Oslo Univ. Hospital); Martinsen, Ørjan G (Univ. of Oslo)</td>
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<td>Flexible Organic TFT Bio-Signal Amplifier using Reliable Chip Component</td>
<td>Yoshimoto, Shusuke* (Osaka Univ.); Uemura, Takafumi (Osaka Univ.); Akiyama, Mihoko (Osaka Univ.); Ihara, Yoshihiro (Research &amp; Development Division, Shinko Electric Industries Co.,); Otake, Satoshi (Research &amp; Development Division, Shinko Electric Industries Co.,); Fujii, Tomoharu (Research &amp; Development Division, Shinko Electric Industries Co.,); Araki, Teppei (Osaka Univ.); Sekitani, Tsuyoshi (Osaka Univ.)</td>
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<td>11:35-11:50</td>
<td>Continuous Systolic and Diastolic Blood Pressure Estimation Utilizing Long Short-Term Memory Network</td>
<td>Lo, Po Wen* (The Chinese University of Hong Kong); Li, Charles X.-T. (The Chinese University of Hong Kong); Wang, Jiankun (The Chinese University of Hong Kong); Cheng, Jiyu (The Chinese University of Hong Kong); Meng, Max Q.-H. (The Chinese University of Hong Kong)</td>
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<td>12:05-12:20</td>
<td>An in Vivo MEMS Sensor System for Percutaneous Measurement of Urinary Bladder</td>
<td>Clausen, Ingelin* (SINTEF Digital, Norway); W Tvedt, Lars Geir (SINTEF ICT, Norway); Hellandsvik, Are (SINTEF Digital); Rognlien, Dag Kristian (SINTEF Digital); Glott, Thomas (Sunnaas Rehabilitation Hospital)</td>
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#### Zworykin Room

**Biomaterials and Patterning I (Oral Session)**

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<td>Protein Patterning using Germanium as a Sacrificial Layer</td>
<td>Lu, Bohao* (University of California Berkeley); Maharbiz, Michel (University of California, Berkeley)</td>
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<td>Conducting Polymer Microcontainers for Biomedical Applications</td>
<td>Antensteiner, Martin (Univ. of Houston); Khorrami, Milad (Univ. of Houston); Fallahianbjan, Fatemeh (Penn State Univ.); Borhan, Ali (The Pennsylvania State Univ.); Abidian, Mohammad Reza* (Univ. of Houston)</td>
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<td>Mechanical Properties of Triply Periodic Minimal Surface Structures Mimicking the Microstructure of Woodpecker's Cranial Bone</td>
<td>Ni, Yikun (Beihang University); Wang, Lizhen (Beihang University); Fan, Yubo* (Beihang University)</td>
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11:35-11:50  ThBT6.4
**Self-Spreading Method for Forming Lipid Bilayer on a Patterned Agarose Gel:**  
**Toward Precise Lipid Bilayer Patterning** .................................................. 1877-1880
Shimba, Kenta* (Tokyo Institute of Technology); Shoji, Kazuma (Tokyo Institute of Technology);  
Miyamoto, Yoshitaka (Nagoya University); Yagi, Tohru (Tokyo Institute of Technology)

11:50-12:05  ThBT6.5
**Tunable Nanostructured Conducting Polymers for Neural Interface Applications** .................................................. 1881-1884
Abidian, Mohammad Reza* (University of Houston); Antensteiner, Martin (University of Houston)

12:05-12:20  ThBT6.6
**Simple and Fast Polydimethylsiloxane (PDMS) Patterning using a Cutting Plotter and Vinyl Adhesives to Achieve Etching Results** .................................................. 1885-1888
Kim, Hyun (Seoul National Univ.); Yoo, Sunyoung (Seoul National Univ.); Kim, Ji Sung (Seoul National Univ.);  
Wang, Zihuan (Seoul National Univ.); Lee, Woon-Hee (Seoul National Univ.); Koo, Kyoin (Univ. of Ulsan);  
Seo, Jong Mo* (Seoul National Univ., School of Engineering); Cho, Dong Il (Seoul National Univ.)

ThBT7: 10:50-12:20  Herrick Room
**Motion Analysis** (Oral Session)
**Chair:** Thomas, Louise (Simon Fraser University)

10:50-11:05  ThBT7.1
**Human Locomotion Analysis: Identifying a Dynamic Mapping between Upper and Lower Limb Joints using the Koopman Operator** .................................................. 1889-1892
Boudali, A. Mounir* (The University of Sydney); Sinclair, Peter James (The University of Sydney);  
Smith, Richard (The University of Sydney); Manchester, Ian (Umeå University)

11:05-11:20  ThBT7.2
**Fusing Motion-Capture and Inertial Measurements for Improved Joint State Recovery: An Application for Sit-to-Stand Actions** .................................................. 1893-1896
Matthew, Robert, Peter* (UC Berkeley); Seko, Sarah (UC Berkeley); Bajcsy, Ruzena (UC Berkeley, CITRIS)

11:20-11:35  ThBT7.3
**Quantifying the Effects of On-the-Fly Changes of Seating Configuration on the Stability of a Manual Wheelchair** .................................................. 1897-1900
Thomas, Louise* (Simon Fraser University); Borisoff, Jaimie F. (British Columbia Institute of Technology);  
Sparrey, Carolyn (Simon Fraser University)

11:35-11:50  ThBT7.4
**Simulation of Oxygen Uptake and Leg Joint Reaction Force during Ergometer Exercise under Altered Gravity** .................................................. 1901-1904
Tagawa, Yoshihiko (Kurume University); Yamamoto, Naosuke* (Kurume University); Omoto, Masayuki (Kurume University); Matsuse, Hiroo (Kurume University Hospital); Shiba, Naoto (Kurume University Hospital)

11:50-12:05  ThBT7.5
**Analysis of Gait Pattern during Stair Walk for Improvement of Gait Training Robot** .................................................. 1905-1908
Park, Sang-Eun (Biomedical Engineering Research Center, Asan Medical Center); Ho, Ye Ji (the Biomedical Engineering Research Center, Asan Medical Center); Moon, Youngjin (Asan Medical Center); Choi, Jaesoon* (Asan Institute for Life Sciences, Asan Medical Center)

12:05-12:20  ThBT7.6
**Body Pose Estimation in Depth Images for Infant Motion Analysis** .................................................. 1909-1912
Hesse, Nicolas* (Fraunhofer Institute of Optronics, System Technologies and Image); Schröder, A. Sebastian (Dept. of Paediatric Neurology and Developmental Medicine, D); Müller-Felber, Wolfgang (Dept. of Paediatric Neurology and Developmental Medicine, D); Bodenstein, Christoph (Fraunhofer Institute of Optronics, System Technologies and Image); Arens, Michael (Fraunhofer Institute of Optronics, System Technologies and Image); Hofmann, Ulrich G. (University of Freiburg)
### ThBT8: 10:50-12:20

**Schwan Room**

**Brain-Computer Interface II (Oral Session)**

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<td>Luu, Trieu Phat* (University of Houston); Brantley, Justin (University of Houston); Zhu, Fangshi (University of Houston); Contreras-Vidal, José (University of Houston)</td>
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<td>ThBT8.2</td>
<td>EEG-Guided Robotic Mirror Therapy System for Lower Limb Rehabilitation</td>
<td>Marghi, Yeganeh M.* (Northeastern University); Farjadian, Amir Bahador (Northeastern University); Yen, Sheng-che (Northeastern University); Erdogmus, Deniz (Northeastern University)</td>
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<td>Boosting Performance in Brain-Machine Interface by Classifier-Level Fusion based on Accumulative Training Models from Multi-Day Data</td>
<td>Yang, Huijuan* (Institute for Infocomm Research, Agency for Science, Technology an); Libedinsky, Camilo (A*STAR); Guan, Cuntai (Nanyang Technological University); Ang, Kai Keng (Institute for Infocomm Research); So, Rosa (Institute for Infocomm Research)</td>
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<td>ThBT8.4</td>
<td>Stop State Classification in Intracortical Brain-Machine-Interface</td>
<td>Koh, Tze Hui (Institute for Infocomm Research); Libedinsky, Camilo (A<em>STAR); Guan, Cuntai (Nanyang Tech. Univ.); Ang, Kai Keng (Institute for Infocomm Research); So, Rosa</em> (Institute for Infocomm Research)</td>
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<td>11:50-12:05</td>
<td>ThBT8.5</td>
<td>A Frequency Recognition Method based on Multitaper Spectral Analysis and SNR Estimation for SSVEP-Based Brain–computer Interface</td>
<td>Yang, Chen (Tsinghua University); Xu, Han (Tsinghua University); Wang, Yijun (Institute of Semiconductors, Chinese Academy of Sciences); Gao, Xiaorong* (Tsinghua University)</td>
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<td>ThBT8.6</td>
<td>Learning to Control an SSVEP-Based BCI Speller in Naïve Subjects</td>
<td>Zhihua Tang, Zhihua (Hebei University of Technology); Wang, Yijun* (Institute of Semiconductors, Chinese Academy of Sciences); Dong, Guoya (Hebei University of Technology); Pei, Weihua (Institute of semiconductors, CAS); Chen, Hongda (institute of semiconductors, CAS)</td>
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### ThBT9: 10:50-12:20

**Plonsey Room**

**Neural Stimulation I (Oral Session)**

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<td>ThBT9.1</td>
<td>A 64-Channels Neural Interface for Biopotentials Recording and PNS Stimulation</td>
<td>Bisoni, Lorenzo (Univ. di cagliari); Carboni, Caterina* (Univ. di cagliari); Puddu, Roberto (Univ. di cagliari); Barabino, Gianluca (Univ. of Cagliari); Pani, Danilo (Univ. of Cagliari); Raffo, Luigi (Univ. of Cagliari); Mueller, Matthias (Univ. of Freiburg); Stieglitz, Thomas (Univ. of Freiburg); del Valle, Jaume (Univ. Autonoma de Barcelona); de la Oliva, Natália (Univ. Autònoma de Barcelona); Delgado-Martinez, Ignacio (National Univ. of Singapore); Navarro, Xavier (Univ. Autònoma de Barcelona); Barbaro, Massimo (Univ. of Cagliari)</td>
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<td>ThBT9.2</td>
<td>Auditory Responses to Short-Wavelength Infrared Neural Stimulation of the Rat Cochlear Nucleus</td>
<td>Jiang, Bin (Chongqing Univ.); Xia, Nan (Chongqing Univ.); Hou, Wensheng* (Bioengineering Inst of Chongqing Univ)</td>
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<td>ThBT9.3</td>
<td>A Computational Study on Effect of a Transcranial Channel as a Skull/Brain Interface in the Conventional Rectangular Patch-Type Transcranial Direct Current Stimulation</td>
<td>Seo, Hyeon (Gwangju Institute of Science and Technology); Kim, Hyoung-Ihl (Gwangju Institute of Science and Technology); Jun, Sung Chan* (Gwangju Institute of Science and Technology)</td>
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Assessing RTMS Effects in MdDS: Cross-Modal Comparison between Resting State EEG and fMRI Connectivity
Chen, Yafen (University of Oklahoma); Li, Chuang (University of Oklahoma); Shou, Guofa (University of Oklahoma); Urbano, Diamond (Laureate Institute for Brain Research); Cha, Yoon-Hee (Laureate Institute of Brain Research); Ding, Lei (University of Oklahoma); Yuan, Han* (University of Oklahoma)

Closed-Loop Low-Frequency DBS Restores Thalamocortical Relay Fidelity in a Computational Model of the Motor Loop
Huang, Han (Johns Hopkins University); Santaniello, Sabato* (University of Connecticut)

Electric Field Stimulation Protects Injured Spinal Cord from Secondary Inflammatory Response in Rats
Huo, Xiaolin (Chinese Academy of Sciences); Zhang, Guanghao (Institute of Electrical Engineering, Chinese Academy of Sciences); Wu, Changzhe (Chinese Academy of Sciences); Zhang, Cheng* (Chinese Academy of Sciences, Beijing)

A Study on Setting of the Fatigue Limit of Temporary Dental Implants
Kim, Mi Hye* (Ministry of Food and Drug Safety); Eunjeong, Cho (Ministry of Food and Drug Safety); Jiwon, Lee (Ministry of Food and Drug Safety); Eunkyo, Kim (Medical Devices Research Division); Sihyung, Yoo (Ministry of Food and Drug Safety); Park, Chang Won (National Institute of Food and Drug Safety Evaluation, Ministry)

A Wirelessly Powered Implantable Radiofrequency Nerve Lesioning System for the Treatment of Chronic Pain
Tang, Sai Chun* (Harvard Medical School, Brigham and Women's Hospital); McDannold, Nathan (Brigham & Women's Hospital); Vaninetti, Michael (University of California San Diego, VA San Diego Healthcare Syst)

An IC-Based Controllable Stimulator for Respiratory Muscle Stimulation Investigations
Castelli, Jonathan* (Univ. of Bordeaux); Kolbl, Florian (Univ. of Bordeaux); Siu, Ricardo (Florida International Univ.); N'Kaoua, Gilles (CNRS, IMS UMR); Bornat, Yannick (IMS Laboratory); Mangalore, Ashwin (Univ. of Bordeaux, IMS, CNRS UMR); Hillen, Brian (Florida International Univ.); Abbas, James (Arizona State Univ.); Renaud, Sylvie (Univ. of Bordeaux1, IMS, Enseirb); Jung, Ranu (Florida International Univ.); Lewis, Noëlle (Univ. of Bordeaux 1, IPB, IMS, CNRS UMR)

An Intracardiac Electrogram Model to Bridge Virtual Hearts and Implantable Cardiac Devices
Ai, Weiei* (University of Auckland); Patel, Nitish (University of Auckland); Roop, Parthasarathi (University of Auckland); Malik, Avinash (University of Auckland); Allen, Nathan (University of Auckland); Trew, Mark L. (University of Auckland)

A Wireless Optical Power System for Medical Implants using Low Power Near-IR Laser
Saha, Anindo* (American International Univ.-Bangladesh); Iqbal, Shabab (American International Univ.-Bangladesh); Karmaker, Mithun (American International Univ.-Bangladesh); Zinnat, Syeda Fairose (American International Univ.-Bangladesh); Ali, M. Tanseer (American International Univ.-Bangladesh)

Deep Scattering Convolution Network based Features for Ultrasonic Fatty Liver Tissue Characterization
Ramkrishna, Bharath* (Indian institute of Technology Hyderabad); P, Rajalakshmi (Indian Institute of Technology Hyderabad)
11:05-11:20  ThBT14.2
Liu, Zi-chuan* (Nanyang Technological University); Hu, Yi-fei (Nanyang Technological University); Xu, Hang (Nanyang Technological University); Nasser, Lamees (Bioinformatics Institute (BII), A*STAR); Boudier, Thomas (A-STAR); Coquent, Philippe (Nanyang Technological University); Yu, Hao (Nanyang Technological University)

11:20-11:35  ThBT14.3
**Automated Discrimination of Dementia Spectrum Disorders using Extreme Learning Machine and Structural T1 MRI Features**  1990-1993
Kim, Jongin* (Gwangju Institute of Science and Technology); Lee, Boreom (Gwangju Institute of Science and Technology (GIST))

11:35-11:50  ThBT14.4
Li, Xiuli* (IBM Research – China); Zhang, Hao (ANKON Technologies Co., LTD - China); Zhang, Xiaolu (IBM Research – China); Liu, Hao (ANKON Technologies Co., LTD - China); Xie, Guotong (IBM Research – China)

11:50-12:05  ThBT14.5
**Brain Tumor Segmentation using Cascaded Deep Convolutional Neural Network**  1998-2001
Hussain, Saddam (University of Engineering and Technology, Taxila); Anwar, Syed* (University of Engineering and Technology); Majid, Muhammad (University of Engineering and Technology, Taxila)

12:05-12:20  ThBT14.6
**Surgical Tool Detection in Cataract Surgery Videos through Multi-Image Fusion Inside a Convolutional Neural Network**  2002-2005
Alhajj, Hassan (Inserm); Lamard, Mathieu (Université de Bretagne Occidentale); Charrière, Katia (LaTIM - INSERM UMR 1101, Brest, F-29200 France); Cochener, Béatrice (CHU Morvan); Quellec, Gwenole* (Inserm)

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**ThBT15: 10:50-12:20**  Webster Room
**Bioengineering Advances in the Diagnosis and Treatment of Sleep Apnea II (Minisymposium)**
**Chair:** Khoo, Michael (University of Southern California)
**Co-Chair:** Penzel, Thomas (Charité Universitätsmedizin Berlin)

10:50-11:05  ThBT15.1
**Screening Patients for Risk of Sleep Apnea using Facial Photographs**  2006-2009
de Chazal, Philip* (University of Sydney); Tabatabaei Balaei, Asghar (University of Sydney); Nosrati, Hadis (The University of Sydney)

**ThBT17: 10:50-12:20**  Einthoven Hall
**Signal Processing – Fetal and Neonatal Physiology (Oral Session)**
**Chair:** Khandoker, Ahsan Habib (Khalifa University of Science, Technology and Research)

10:50-11:05  ThBT17.1
**Automatic Quiet Sleep Detection based on Multifractality in Preterm Neonates: Effects of Maturation**  ... 2010-2013
Lavanga, Mario* (KU Leuven); De Wel, Ofelie (KU Leuven); Caicedo Dorado, Alexander (Katholieke Universiteit Leuven); Heremans, Elisabeth (KU Leuven); Jansen, Katrien (Dept. of Pediatrics, University Hospital Gasthuisberg, Leuven); Dereymaeker, Anneleen (Dept. of Development and Regeneration, University of Leuven); Nauta, Gunnar (University Hospitals Leuven); Van Huffel, Sabine (Katholieke Universiteit Leuven)

11:05-11:20  ThBT17.2
**Mutual Information for Intrapartum Fetal Heart Rate Analysis**  2014-2017
Granero Belincho Carlos, Granero (Univ Lyon, Ens de Lyon, Univ Claude Bernard, CNRS, Laboratoire d); Roux, Stéphane* (ENS Lyon, CNRS); Garnier, Nicolas B. (Univ Lyon, ENS de Lyon, Univ Claude Bernard, CNRS); Abry, Patrice (ENS Lyon, CNRS); Doret, Muriel (Hospices Civils de Lyon Université Lyon I)

11:20-11:35  ThBT17.3
**Portable Neonatal EEG Monitoring and Sonification on an Android Device**  2018-2021
Poveda Pena, Jonatan (Universitat Politècnica de Catalunya); O'Sullivan, Mark* (University College Cork); Popovici, Emanuel (University College Cork); Temko, Andriy (University College Cork)
A Semi-Markov Chain Approach to Modeling Respiratory Patterns Prior to Extubation in Preterm Infants .............................. 2022-2026

Influence of ECG Sampling Rate in Fetal Heart Rate Variability Analysis ............................................... 2027-2030
De Jonckheere, Julien* (CHRU de Lille); Jeanne, Mathieu (CHRU de Lille); Logier, Regis (CHRU de Lille)

Neural Networks and Support Vector Machines I (Oral Session)

Convolutional Neural Networks for Event-Related Potential Detection: Impact of the Architecture ............... 2031-2034
Cecotti, Hubert* (University of Ulster)

Design of Deep Convolutional Networks for Prediction of Image Rapid Serial Visual Presentation Events . 2035-2038
Mao, Zijing (UTSA); Yao, Wan Xiang (UTSA); Huang, Yufei* (University of Texas at San Antonio)

A Novel Approach for Automatic Detection of Atrial Fibrillation based on Inter Beat Intervals and Support Vector Machine .......................................................... 2039-2042
Andersen, Rasmus Sten* (Technical University of Denmark); Poulsen, Erik S. (Cortrium ApS); Puthusserypady, Sadasivan (Technical University of Denmark)

Informative Sensor Selection and Learning for Prediction of Lower Limb Kinematics using Generative Stochastic Neural Networks ......................................................... 2043-2046
Chong, Eunsuk (Korea Institute of Science and Tech.); Choi, Taejin (Korea Institute of Science and Tech.);
Kim, Hyungmin (Korea Institute of Science and Tech.); Kim, Seung-Jong (Korea Institute of Science and Tech.);
Hwang, Yoha (Korea Institute of Science and Tech.); Lee, Jong Min* (Korea Institute of Science and Tech.)

Using Non-Iterative Methods and Random Weight Networks to Classify Upper-Limb Movements through sEMG Signals ............................................................. 2047-2050
Cene, Vinicius H. (UFRGS); Favieiro, Gabriela Winkler* (Federal University of Rio Grande do Sul (UFRGS));
Balbinot, Alexandre (Federal University of Rio Grande do Sul (UFRGS))

Wearable Devices for Cardiovascular Monitoring (Invited Session)

Exploration and Validation of Alternate Sensing Methods for Wearable Continuous Pulse Transit Time Measurement using Optical and Bioimpedance Modalities ......................... 2051-2055
Ibrahim, Bassem (Texas A&M Univ.); Nathan, Viswam (Texas A&M Univ.); Jafari, Roozbeh* (Texas A&M Univ.)

Experimental Research on Oxygen Enrichment in Bioreactors based on Oxygen Carriers .......................... N/A
Wu, Changzhe (Chinese Academy of Sciences); Zhang, Cheng (Chinese Academy of Sciences, Beijing);
Zhang, Guanghao (Institute of Electrical Engineering, Chinese Academy of Sciences);
Huo, Xiaolin* (Chinese Academy of Sciences)
14:35-14:50
**In Vitro Cell Culture Study of the Conditions of Inhibition Effect of Tumors under Alternating Electric Field**
Huang, Chun-Hao (Chang Gung University); Lei, Kin Fong* (Chang Gung University)

14:50-15:05
**Evaluation of Histological and Biomechanical Properties on Engineered Meniscus Tissues using Sonication Decellularization**
Mardhiyah, Ainaaul (International Islamic University Malaysia); Sha’ban, Munirah (International Islamic University Malaysia); Azhim, Azran* (International Islamic University Malaysia)

15:05-15:20
**Improve Blood Compatibility of Biore absorbable Magnesium Stents Coated with Functionalized Anti-CD34 Antibody and Heparin-Collagen Multiplayers**
Kan, Chung-Dann* (Natl. Cheng Kung Univ. Hospital, Dept. of Surgery); Lai, Yi-Ping (Natl. Cheng Kung Univ.)

15:20-15:35
**Evaluation of Recellularization on Decellularized Aorta Scaffolds Engineered by Ultrasonication Treatment**
Fitriatul, Nurul (International Islamic University Malaysia); Sha’ban, Munirah (International Islamic University Malaysia); Azhim, Azran* (International Islamic University Malaysia)

15:35-15:50
**A Three-Dimensional Cell Culture Device for Simulation of Hepatic Hypertension**
Kuo, Po-Ling* (National Taiwan University); Phung, Hao-Dinh (National Taiwan University)

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**ThCT8: 14:20-15:50**

**Brain-Computer Interface III (Oral Session)**

**Chair:** Lee, Boreom (Gwangju Institute of Science and Technology (GIST))

14:20-14:35
**Phase-Based SSVEPs for Real-Time Control of a Motorised Bed**
Gauci, Norbert (University of Malta); Falzon, Owen* (University of Malta); Camilleri, Tracey (University of Malta); Camilleri, Kenneth Patrick (University of Malta)

14:35-14:50
**Hierarchical Decoding of Grasping Commands from EEG**
Omedes, Jason* (University of Zaragoza); Schwarz, Andreas (Graz, University of Technology); Montesano, Luis (Universidad de Zaragoza); Müller-Putz, Gernot (Graz University of Technology)

14:50-15:05
**Detection of Self-Paced Movement Intention from Pre-Movement Electroencephalogram Signals with Hilbert Transform**
Zeng, Hong* (Southeast Univ.); Wu, Changcheng (Southeast Univ.); Song, Aigo (Southeast Univ.); Xu, Baoguo (Southeast Univ.); Li, Huijun (Southeast Univ.); Pengcheng, Wen (AVIC Aeronautics Computing Technique Research Institute); Liu, Jia (Nanjing Univ. of Information Sciences & Technology)

15:05-15:20
**The Contribution of Different Frequency Bands in Class Separability of Covert Speech Tasks for BCIs**
Jahangiri, Amir* (University of Essex); Sepulveda, Francisco (University of Essex)

15:20-15:35
**EEG Classification for Motor Imagery BCI using Phase-Only Features Extracted by Independent Component Analysis**
Qureshi, Muhammad Naveed Iqbal (Gwangju Institute of Science and Tech., Gwangju); Cho, Dongrae (Gwangju Institute of Science and Tech.); Lee, Boreom* (Gwangju Institute of Science and Tech. (GIST))

15:35-15:50
**Speeding Up SVM Training in Brain-Computer Interfaces**
Lee, David (The Catholic University of Korea); Lee, Hee-Jae (The Catholic University of Korea); Park, Sang-Hoon (The Catholic Univ. of Korea); Jung, Woo-Hyuk (The Catholic University of Korea); Kim JaeHo, JaeHo (The Catholic University of Korea, Dept. Digital Media); Lee, Sang-Goog* (the Catholic University of Korea)
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<thead>
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<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
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<tr>
<td>14:20-14:35</td>
<td>ThCT9.1</td>
<td>Predicting the Stimulation Effectiveness using Pre-Stimulation Neural States via Optogenetic Activation of the Medial Septum Glutamatergic Neurons Modulating the Hippocampal Neural Activity</td>
<td>Park, Sang-Eon* (Georgia Institute of Technology); Laxpati, Nealen (Emory University School of Medicine, Georgia Institute of Technology); Connolly, Mark (Emory University); Mahmoudi, Babak (Emory University); Gross, Robert (Emory University)</td>
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<td>14:35-14:50</td>
<td>ThCT9.2</td>
<td>Galvanic Vestibular Stimulation (GVS) Effects on Impaired Interhemispheric Connectivity in Parkinson's Disease</td>
<td>Lee, Soojin* (The University of British Columbia); Kim, Diana (The University of British Columbia); McKeown, Martin (University of British Columbia)</td>
</tr>
<tr>
<td>14:50-15:05</td>
<td>ThCT9.3</td>
<td>Network-Mediated Responses of ON Ganglion Cells to Electric Stimulation become Less Consistent Across Trials during Retinal Degeneration</td>
<td>Lee, Jae-Ik* (Henry Ford Health System); Fried, Shelley (Massachusetts General Hospital / Harvard Medical School); Im, Maesoon (Henry Ford Health System)</td>
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<td>15:05-15:20</td>
<td>ThCT9.4</td>
<td>An Artifact-Suppressed Stimulator for Simultaneous Neural Recording and Stimulation Systems</td>
<td>Liu, Xu* (Beijing Univ. of Technology); Yao, Lei (Institute of Microelectronics, Singapore); Li, Peng (Institute of Microelectronics); Liu, Lei (Nanyang Technological Univ., Singapore); Zou, Xiaodan (Institute of Microelectronics, Singapore); Je, Minkyu (Institute of Microelectronics); Xu, Yong Ping (National Univ. of Singapore)</td>
</tr>
<tr>
<td>15:20-15:35</td>
<td>ThCT9.5</td>
<td>A Machine Learning Approach to Characterizing the Effect of Asynchronous Distributed Electrical Stimulation on Hippocampal Neural Dynamics in Vivo</td>
<td>Connolly, Mark* (Emory University); Park, Sang-Eon (Georgia Institute of Technology); Mahmoudi, Babak (Emory University)</td>
</tr>
<tr>
<td>15:35-15:50</td>
<td>ThCT9.6</td>
<td>Effects of Transcranial Direct Current Stimulation on Steady-State Visual Evoked Potentials</td>
<td>Liu, Bingchuan (Tsinghua Univ.); Chen, Xiaogang (Institute of Biomedical Engineering, Chinese Academy of Medical); Yang, Chen (Tsinghua Univ.); Wu, Jian (Tsinghua Univ.); Gao, Xiaorong* (Tsinghua Univ.)</td>
</tr>
<tr>
<td>14:20-14:35</td>
<td>ThCT10.1</td>
<td>A Novel Blood Pressure Estimation Method Combing Pulse Wave Transit Time Model and Neural Network Model</td>
<td>Xu, Jun (Shanghai University); Jiang, Jiehui* (Shanghai University); Zhou, Hucheng (Shanghai University); Yan, Zhuangzhi (Shanghai University)</td>
</tr>
<tr>
<td>14:35-14:50</td>
<td>ThCT10.2</td>
<td>Assessment of Stress Wave Induced by Diode Laser</td>
<td>Oh, Han-Byeol (Konkuk University); Kim, Ji-Sun (Konkuk University); Baek, Jin-Young (Konkuk University); Jun, Jae-Hoon* (Konkuk University)</td>
</tr>
<tr>
<td>14:50-15:05</td>
<td>ThCT10.3</td>
<td>Elastic Modulus Estimation based on Local Displacement Observation of Elastic Body</td>
<td>Morita, Mitsuki* (Kyoto University); Nakao, Megumi (Kyoto University); Matsuda, Tetsuya (Kyoto University)</td>
</tr>
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</table>
15:05-15:20  
**The Classification for “Equilibrium Triad” Sensory Loss based on sEMG Signals of Calf Muscles**  
Yu, Hairong* (University of Technology, Sydney); Guo, Kairui (University of Technology, Sydney); Luo, Jie (Sun Yat-sen University); Cao, Kai (University of Technology, Sydney); Nguyen, Hung T. (University of Technology, Sydney); Su, Steven Weidong (University of Technology, Sydney)  
2142-2145

15:20-15:35  
**Likelihood-Based Artefact Detection in Continuously-Acquired Patient Vital Signs**  
Colopy, Glen Wright* (University of Oxford); Zhu, Tingting (University of Oxford); Clifton, Lei (University of Oxford); Roberts, Stephen (University of Oxford); Clifton, David (University of Oxford)  
2146-2149

15:35-15:50  
**Accuracy of a Wavelet-Based Fall Detection Approach using an Accelerometer and a Barometric Pressure Sensor**  
Ejupi, Andreas* (Simon Fraser Univ. (SFU)); Galang, Chantel (Simon Fraser Univ.); Aziz, Omar (Simon Fraser Univ.); Park, Edward J. (Simon Fraser Univ.); Robinovitch, Stephen (Simon Fraser Univ.)  
2150-2153

14:20-15:50  
**Recent Advances on Cuff-Less Blood Pressure Measurement Technology II** (Minisymposium)  
Chair: Mukkamala, Ramakrishna (Michigan State University)  
Co-Chair: Mestha, Lalit, K. (GE Global Research)

15:20-15:35  
**Arterial Blood Pressure Estimation using Ultrasound: Clinical Results on Healthy Volunteers and a Medicated Hypertensive Volunteer**  
Zakrzewski, Aaron M.* (Massachusetts Institute of Tech.); Anthony, Brian W. (Massachusetts Institute of Tech.)  
2154-2157

14:20-15:50  
**Modeling of Modern Devices and Technologies with Computational Human Phantoms – III** (Invited Session)  
Chair: Wenger, Cornelia (Novocure GmbH)

14:35-14:50  
**Measurement of Perception Thresholds for Electrical Noise Stimuli**  
Karpul, David (University of Western Sydney, University of Cape Town); McIntyre, Sarah (Western Sydney University); van Schaik, André (The University of Sydney); Breen, Paul* (University of Western Sydney)  
2166-2169

14:20-14:35  
**Transmit Coil Design for Wireless Power Transfer for Medical Implants**  
Lemdiasov, Rosti (Cambridge Consultants); Venkatasubramanian, Arun* (Cambridge Consultants)  
2158-2161

15:20-15:35  
**A Comparison of Two Anatomical Body Models Derived from the Female Visible Human Project Data**  
Massey, Jackson White (University of Texas at Austin); Prokop, Alexander* (Computer Simulation Technology); Yilmaz, Ali (University of Texas at Austin)  
2162-2165

14:20-15:50  
**Tissue Stimulation Technologies** (Oral Session)  
Chair: Panescu, Dorin (Advanced Cardiac Therapeutics)  
Co-Chair: Cheng, Leo (The University of Auckland)

14:20-14:35  
**Measurement of Perception Thresholds for Electrical Noise Stimuli**  
Karpul, David (University of Western Sydney, University of Cape Town); McIntyre, Sarah (Western Sydney University); van Schaik, André (The University of Sydney); Breen, Paul* (University of Western Sydney)  
2166-2169

14:35-14:50  
**New Conducted Electrical Weapons: Finite Element Modeling of Safety Margins**  
Panescu, Dorin* (Advanced Cardiac Therapeutics); Kroll, Mark William (University of Minnesota); Brave, Michael (LAAW International, LLC, Scottsdale, AZ)  
2170-2176
ThCT13.3

System Design and Experimental Research of Lower Esophageal Sphincter Stimulator for Treatment of Gastroesophageal Reflux Disease

Sun, Xinchen (Southeast Univ.); Tao, Wanjun (Southeast Univ.); Zhu, Chuanqing (Southeast Univ.); Zhao, Lili (The First Affiliated Hospital of Nanjing Medical Univ.); Wang, Min (Nanjing Medical Univ.); Lü, Xiaoying* (Southeast Univ.); Wang, Zhigong (Southeast Univ.); Fan, Zhining (The First Affiliated Hospital of Nanjing Medical Univ.)

ThCT13.4

Design and Application of a Novel Gastric Pacemaker

Alighaleh, Saeed (Auckland Bioengineering Institute, Univ. of Auckland); Angeli, Timothy Robert (Auckland Bioengineering Institute, Univ. of Auckland); Sathar, Shameer (Univ. of Auckland); O’Grady, Gregory (Univ. of Auckland); Cheng, Leo K* (The Univ. of Auckland); Paskaranandavadivel, Niranchan (The Univ. of Auckland)

ThCT13.5

New Conducted Electrical Weapons: Electrical Safety Relative to Relevant Standards

Panescu, Dorin* (Advanced Cardiac Therapeutics); Nerheim, Max (TASER International); Kroll, Mark William (University of Minnesota); Brave, Michael (LAAW International, LLC, Scottsdale, AZ)

ThCT13.6

New Conducted Electrical Weapons: Thoracic Cage Shielding Effect

Panescu, Dorin* (Advanced Cardiac Therapeutics); Kroll, Mark William (University of Minnesota); Brave, Michael (LAAW International, LLC, Scottsdale, AZ)

ThCT17: 14:20-15:50

Signal Processing and Modelling Techniques for Fetal Monitoring (Invited Session)

Chair: Khandoker, Ahsan Habib (Khalifa University of Science, Technology and Research)

14:20-14:35

Investigating Fetal Myocardial Function in Heart Anomalies by Doppler Myocardial Performance Indices

Khandoker, Ahsan Habib* (Khalifa University of Science, Technology and Research); Alangari, Haitham M. (Khalifa University); Marzbanrad, Faezeh (The University of Melbourne); Kimura, Yoshitaka (Tohoku Univ)

14:35-14:50

Detecting Fetal Heart Sounds by Means of Fractal Dimension Analysis in the Wavelet Domain

Koutsiana, Elisavet* (Lab. of Medical Informatics, The Medical School, Aristotle Unive); Hadjileontiadis, Leontios (Aristotle University of Thessaloniki); Chouvarda, Ioanna (Aristotle University); Khandoker, Ahsan Habib (Khalifa University of Science, Technology and Research)

ThCT18: 14:20-15:50

Kalman Filtering (Oral Session)

Chair: Hamid, Laith (University of Kiel)

14:20-14:35

Self-Reported Well-Being Score Modelling and Prediction: Proof-of-Concept of an Approach based on Linear Dynamic Systems

Li, Xinyang (National University of Singapore); Poli, Riccardo (University of Essex); Valenza, Gaetano (University of Pisa); Scilingo, Enzo Pasquale (University of Pisa); Citi, Luca* (University of Essex)

14:35-14:50

Removal of Spurious Phase Variations in Oscillatory Signals

Mortezapourghadham, Zeinab* (Saarland University); Strauss, Daniel J. (Saarland University, Medical Faculty)

14:50-15:05

Spatial Projection as a Preprocessing Step for EEG Source Reconstruction using Spatiotemporal Kalman Filtering

Hamid, Laith* (Univ. of Kiel); Al Farawn, Ali (Univ. of Kufa); Merlet, Isabelle (INSERM - Universite de Rennes 1); Japaridze, Natia (Dept. of Neuropediatrics, Christian-Albrechts-Univ. of); Heute, Ulrich (Univ. of Kiel); Stephani, Ulrich (Christian-Albrechts-Univ. of Kiel); Galka, Andreas (Christian-Albrechts-Univ. of Kiel); Wendling, Fabrice (INSERM - Université de Rennes 1); Siniatchkin, Michael (Univ. of Kiel)
### Source Reconstruction via the Spatiotemporal Kalman Filter and LORETA from EEG Time Series with 32 or Fewer Electrodes

Hamid, Laith* (Univ. of Kiel); Al Farawn, Ali (Univ. of Kufa); Merlet, Isabelle (INSERM - Université de Rennes 1); Japaridze, Natia (Dept. of Neuropediatrics, Christian-Albrechts- Univ. of); Heute, Ulrich (Univ. of Kiel); Stephani, Ulrich (Christian-Albrechts-Univ. of Kiel); Galka, Andreas (Christian-Albrechts-Univ. of Kiel); Wendling, Fabrice (INSERM - Université de Rennes 1); Siniatchkin, Michael (Univ. of Kiel)

### Detecting Dynamical Changes in Vital Signs using Switching Kalman Filter

Almeida, Vania* (Aston University); Nabney, Ian T. (Aston University)

### A Kalman Filter Approach with State Inequality Constraints for Real-Time Prediction of Intradialytic Hypotension using a PVDF Sensor

Ansari, Sardar* (University of Michigan); Molaei, Somayeh (University of Michigan); Oldham, Kenn (University of Michigan); Heung, Michael (University of Michigan); Ward, Kevin (University of Michigan); Najarian, Kayvan (University of Michigan - Ann Arbor)

### EEG-Based Emotion Estimation using Adaptive Tracking of Discriminative Frequency Components

Liu, Shuang* (Tianjin Univ.); Zhang, Di (Tianjin Univ.); Tong, Jingjing (Tianjin Univ.); He, Feng (Tianjin Univ.); Qi, Hongzhi (Tianjin Univ.); Zhang, Lixin (Tianjin Univ.); Ming, Dong (Tianjin Univ.)

### A Template Subtraction Method for the Removal of Cardiogenic Oscillations on Esophageal Pressure Signals

Graßhoff, Jan* (University of Luebeck); Petersen, Elke (University of Lübeck); Eger, Marcus (Dräger Medical); Bellani, Giacomo (Dept. of Experimental Medicine, University of Milan-Bicocca); Rostalski, Philipp (Institute for Electrical Engineering in Medicine, University of)

### FPGA Implementation of Adaptive Beamforming in Hearing Aids

Samtani, Kartik (National Institute of Technology Karnataka); Thomas, Jobin (National Institute of Technology Karnataka); Varma, Abhinav (National Institute of Technology Karnataka); David S., Sumam (National Institute of Technology Karnataka, Surathkal); S. P., Deepu* (National Institute of Technology Karnataka)

### Detection of user Independent Single Trial ERPs in Brain Computer Interfaces: An Adaptive Spatial Filtering Approach

Leza Lahuerta, Cristina* (Univ. Politecnica de Madrid); Puthusserypady, Sadasivan (Tech. Univ. of Denmark)
Coherence Analysis of Invasive Blood Pressure and Its Noninvasive Indicators for Improvement of Cuffless Measurement Accuracy

Ding, Xiao-Rong (The Chinese Univ. of Hong Kong); Yan, Bryan P. (Prince of Wales Hospital, The Chinese Univ. of Hong Kong); Zhang, Yuan-Ting (The Chinese Univ. of Hong Kong); Liu, Jing (The Chinese Univ. of Hong Kong); Su, Peng (The Chinese Univ. of Hong Kong); Zhao, Ni* (The Chinese Univ. of Hong Kong)

Phase-Amplitude Coupling Analysis of Spontaneous EEG Activity in Alzheimer's Disease

Poza, Jesus* (Univ. of Valladolid); Bachiller, Alejandro (Univ. of Valladolid); Gomez, Carlos (Univ. of Valladolid); Garcia, Maria (Univ. of Valladolid); Nuñez, Pablo (Univ. of Valladolid); Gomez-Pilar, Javier (Univ. of Valladolid); Tola-Arribas, Miguel A. (Dept. of Neurology, Hospital Universitario Rio Horta); Cano, Monica (Dept. of Clinical Neurophysiology, Hospital Universitario R); Hornero, Roberto (Univ. of Valladolid)

Study on the Effects of Brightness Contrast on Steady-State Motion Visual Evoked Potential

Yan, Wenqiang (Xi’an Jiaotong University); Xu, Guanghua* (Xi’an Jiaotong University); Xie, Jun (Xi’an Jiaotong University); Li, Min (School of Mechanical Engineering, Xi’an Jiaotong University); Zhang, Sicong (Xi’an Jiaotong University); Luo, Ailing (Xi’an Jiaotong University)

Template-DTW based on Inertial Signals: Preliminary Results for Step Characterization

Mantilla, Juan* (Université Paris Descartes); Oudre, Laurent (L2TI, Université Paris 13); Barrios, Rémi (COGNAC G Université Paris Descartes); Vienne, Aliénor (COGNACG, CNRS/SSA UMR 8257, Université Paris Descartes); Ricard, Damien (COGNACG, CNRS/SSA UMR 8257, Université Paris Descartes)

Using Spatial Features for Classification of Combined Motions based on Common Spatial Pattern

Lu, Huiyang (School of Data and Computer Science, Sun Yat-sen University); Zhang, Haoshi (Shenzhen Institutes of Advanced Technology); Wang, Zhong (School of Data and Computer Science, Sun Yat-sen University); Wang, Ruomei (School of Data and Computer Science, Sun Yat-sen University); Li, Guanglin* (Shenzhen Institutes of Advanced Technology)

Surgical Gesture Classification using Dynamic Time Warping and Affine Velocity

Cifuentes Quintero, Jenny Alexandra (Universidad Nacional de Colombia); Pham, Minh Tu* (Institut National des Sciences Appliquées (INSA de Lyon)); Moreau, Richard (INSA-Lyon); Prieto, Flavio (Universidad Nacional de Colombia); Boulanger, Pierre (University of Alberta)

Biological Tissues Identification from their Raman Spectral Signals Acquired by a Raman Needle

Yang, Tangwen* (Beijing Jiaotong University); Zheng, Jiawen (Beijing Jiaotong University)

Counting Malaria Parasites with a Two-Stage EM based Algorithm using Crowsourced Data

Cabrera-Bean, Margarita* (Universitat Politècnica de Catalunya, UPC, BarcelonaTECH); Pagès-Zamora, Alba (Universitat Politècnica de Catalunya); Diaz-Vilor, Carles (Universitat Politècnica de Catalunya); Postigo Camps, Maria (Technical University of Madrid); Cuadrado Sanchez, Daniel (Technical University of Madrid); Luengo-Oroz, Miguel Angel (Universidad Politècnica de Madrid)

Elastic Net based Sparse Feature Learning and Classification for Alzheimer's Disease Identification

Wang, Ling (University of Electronic Science and Technology of China); Liu, Yan* (University of Chinese Academy of Sciences); Zeng, Xiangzhu (Peking University Third Hospital, Beijing, China); Wang, Zheng (Capital University of Medical Sciences)

Reducing False Asystole Alarms in Intensive Care

Dekimpe, Remi (University Catholique de Louvain); Heldt, Thomas* (Massachusetts Institute of Technology)
Nonlinear Dynamic Analysis III (Poster Session)

16:10-16:12
**Elimination of Power Line Interference from ECG Signals using Recurrent Neural Networks**
Qiu, Yue* (Zhejiang University); Xiao, Feng (Zhejiang University); Shen, Halbin (Zhejiang University)

16:12-16:14
**A Novel Heart Rate Variability Analysis using Lagged Poincaré Plot: A Study on Hedonic Visual Elicitation**
Nardelli, Mimma (University of Pisa); Greco, Alberto (University of Pisa); Valenza, Gaetano (University of Pisa); Lanata', Antonio (University of Pisa); Bailon, Raquel (University of Zaragoza); Scilingo, Enzo Pasquale* (University of Pisa)

16:14-16:16
**Pressure Ulcer Risk Detection from Complexity of Activity**
Padhye, Nikhil* (Univ of Texas Health Science Center); Bergstrom, Nancy (The University of Texas Health Science Center at Houston); Rapp, Mary (Retired); Etcher, LuAnn (Spring Arbor University School of Human Services); Redeker, Nancy (Yale School of Nursing)

16:16-16:18
**Feature Analysis of Dysphonia Speech for Monitoring Parkinson’s Disease**
Rueda, Alice* (Ryerson University); Krishnan, Sridhar (Ryerson University)

16:18-16:20
**Heart Rate Variability in Patients with Major Depressive Disorder and Healthy Controls during Non-REM Sleep and REM Sleep**
Kwon, Hyunbin (Seoul National University); Yoon, Heenam (Seoul National University); Jung, Dawoon (Seoul National University); Choi, Sangho (Seoul National University); Choi, Jaewon (Seoul National University Hospital); Lee, Yujin (Seoul National University Hospital); Jeong, Do-Un (Seoul National University Hospital); Park, Kwang S.* (Seoul National University)

16:20-16:22
**Complexity Analysis of EEG under Magnetic Stimulation on Acupoint of Guangming (GB37)**
Geng, Yuehua* (Hebei University of Technology); Xing, Yangyang (Hebei University of Technology); Zhang, Xin (Tianjin Polytechnic University); Ge, Manling (Hebei University of Technology)

16:22-16:24
**Higuchi Fractal Dimension of the Electroencephalogram as a Biomarker for Early Detection of Alzheimer’s Disease**
Al-nuaimi, Ali H. Husseen* (University of Plymouth); Jammeh, Emmanuel (Plymouth University, School of Computing and Mathematics); Sun, Lingfen (Plymouth University, School of Computing and Mathematics); Ifeachor, Emmanuel (University of Plymouth)

16:24-16:26
**Comparison of Different Shielding Methods in Acquisition of Physiological Signals**
Jiang, Yanbing (Shenzhen Institutes of Advanced Technology); Ji, Ning (Shenzhen Institutes of Advanced Technology); Wang, Hui (Shenzhen Institutes of Advanced Technology, Chinese Academy of S); Liu, Xueyu (Chongqing University of Technology); Geng, Yanjuan (Shenzhen Institutes of Advanced Technology); Li, Peng (The Third Affiliated Hospital of Sun Yat-Sen University); Chen, Shixiong* (Shenzhen Institutes of Advanced Technology); Li, Guanglin (Shenzhen Institutes of Advanced Technology)

16:26-16:28
**Investigation of Lagged Poincaré Plot Reliability in Ultra-Short Synthetic and Experimental Heart Rate Variability Series**
Nardelli, Mimma (University of Pisa); Greco, Alberto (University of Pisa); Bolea, Juan (Instituto de Investigación en Ingeniería de Aragón (I3A University); Valenza, Gaetano (University of Pisa); Scilingo, Enzo Pasquale* (University of Pisa); Bailon, Raquel (University of Zaragoza)
16:10-16:12 ThDT4-01.1  
**Noninvasive Hemoglobin Measurement using Unmodified Smartphone Camera and White Flash**  
Wang, Edward* (University of Washington); Li, William (University of Washington); Zhu, Junyi (University of Washington); Rana, Rajneil (University of Washington); Patel, Shwetak (University of Washington)  
2333-2336

16:12-16:14 ThDT4-01.2  
**Development of a Portable Sensorised Handle for the Objective Assessment of the Effectiveness and Concordance of Intervention Plans in Dementia**  
Ma, Jianjia* (Loughborough University); Zecca, Massimiliano (Loughborough University)  
2337-2340

16:14-16:16 ThDT4-01.3  
**Personalized Cumulative UV Tracking on Mobiles and Wearables**  
Dey, Soumyabrata (Samsung R & D Institute, Bangalore, India); Sahoo, Saswata (Samsung R & D Institute, Bangalore, India); Agrawal, Harshit (Samsung Research Institute Bangalore); Mondal, Arindam (Samsung R&D Institute India Bangalore); Bhowmik, Tanmoy* (Samsung Research Institute); Tiwari, Vijay Narayan (Samsung Research India, Bangalore)  
2341-2344

16:16-16:18 ThDT4-01.4  
**A Gaussian Process Regression Model for Walking Speed Estimation using a Head-Worn IMU**  
Zihaijehzadeh, Shaghayegh* (PhD Student, Simon Fraser University); Tae, Chul-Gyu (Bigmotion Technologies); Park, Edward J. (Simon Fraser University)  
2345-2348

16:18-16:20 ThDT4-01.5  
**Wearable Bio Signal Monitoring System Applied to Aviation Safety**  
Kim, Sungho (Air Force Academy); Choi, Booyong (Air Force Academy); Cho, Taehwan (Air Force Academy); Lee, Yongkyun (Air Force Academy); Koo, Hyojin (Air Force Academy); Kim, Dongsoo* (Air Force Academy)  
2349-2352

16:10-16:12 ThDT4-02.1  
**A Simple Algorithm for Emotion Recognition, using Physiological Signals of a Smart Watch**  
Pollreisz, David (TU Wien); TaheriNejad, Nima* (TU Wien)  
2353-2356

16:12-16:14 ThDT4-02.2  
**A Prospective Study of Examining Physiological Signals for Estimating Occurrence of Nocturnal Enuresis**  
Moon, Junhyung* (Yonsei Univ.); Lee, Sangyeop (Yonsei Univ.); Lee, Taeho (Yonsei Univ.); Kye, Saewon (Yonsei Univ.); Lee, Yong Seung (Yonsei Univ.); Shin, Seung-chul (Yonsei Univ.); Lee, K. (Yonsei Univ.)  
2357-2360

16:14-16:16 ThDT4-02.3  
**Wearable Internet of Things – From Human Activity Tracking to Clinical Integration**  
Kumari, Poonam (Kyung Hee Univ.); Lopez-Benítez, Miguel (Univ. of Liverpool); Lee, Gyu Myoung (Liverpool John Moores Univ.); Kim, Tae-Seong (Kyung Hee Univ.); Minhas, Atul Singh* (Univ. of Liverpool)  
2361-2364

16:16-16:18 ThDT4-02.4  
**Reconstructing Physical Activity Monitoring Outcome Measures using an Interval Sampling Approach**  
Amor, James (University of Warwick); James, Christopher* (University of Warwick)  
2365-2368

16:18-16:20 ThDT4-02.5  
**Levels of Activity Identification and Sleep Duration Detection with a Wrist-Worn Accelerometer-Based Device**  
Verma, Vijay Kumar* (Chang Gung University); Lin, Wen-Yen (Chang Gung University); Lee, Ming-Yih (Chang Gung University); Lai, Chao-Sung (Chang Gung University)  
2369-2372

16:20-16:22 ThDT4-02.6  
**A Monitoring System for Walking Rehabilitation after THR or TKR Surgeries**  
Zheng, Qianpeng (Tsinghua University); Chen, Hong* (Tsinghua Univ.)  
2373-2376
A Wearable Sensor based Multi-Criteria-Decision-System for Real-Time Seizure Detection
Ahmed, Abdullah (National Univ. of Sciences and Technology); Ahmad, Waqas (NUST); Khan, Muhammad Jazib (National Univ. of Sciences and Technology); Siddiqui, Shoaib Ahmed (National Univ. of Sciences and Technology); Cheema, Hammad M.* (School of Electrical Engineering and Computer Science, National)

A Novel Method to Monitor Human Stress States using Ultra-Short-Term ECG Spectral Feature
Hwang, Bosun (Seoul National University); Ryu, Ji Woo (Kwangwoon University); Park, Cheolsoo (Imperial College London); Zhang, Byoung-Tak* (Seoul National University)

A Wearable Action Recognition System based on Acceleration and Attitude Angles using Real-Time Detection Algorithm
Zhao, Guoru* (Shenzhen Institutes of Advanced Technology Chinese Academy of Sci); Wang, Bo (Wuhan Univ. of Technology); Liang, Shengyun (Shenzhen Institutes of Advanced Technology, Chinese Academy of S); Ni, Xie (Core Laboratory, Shenzhen Second People's Hospital, First Affili); Ma, Yingnan (Beijing Research Center of Urban System Engineering); Gao, Xing (Beijing Research Center of Urban System Engineering)

IoT/M2M Wearable-Based Activity-Calorie Monitoring and Analysis for Elders
Soraya, Sabrina Ifahdini (National Chiao Tung Univ.); Chiang, Ting-Hui (National Chiao Tung Univ.); Chan, Guo-Jing (National Chiao Tung Univ.); Su, Yi-Juan (National Chiao Tung Univ.); Yi, Chih-Wei (National Chiao Tung Univ.); Tseng, Yu-Chee (National Chiao Tung Univ.); Ching, YuTai* (National Chiao Tung Univ.)

High-Density Ear-EEG
Kappel, Simon Lind* (Aarhus University, Denmark); Kidmose, Preben (Aarhus University, Denmark)

A Model based Analysis of Optimality of Sit-to-Stand Transition
Madhushri, Priyanka (Univ. of Alabama in Huntsville); Jovanov, Emil* (Univ. of Alabama in Huntsville); Milenkovic, Aleksandar (Univ. of Alabama in Huntsville); Shtessel, Yuri (Univ. of Alabama in Huntsville)

A Novel, Low Cost, Wearable Contact-Based Device for Breathing Frequency Monitoring
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Johnson, Jacob J. (Indian Institute of Technology Guwahati); Breault, Macauley S.* (Johns Hopkins University); Sacré, Pierre (Johns Hopkins University); Kerr, Matthew (Johns Hopkins University); Johnson, Matthew (Cleveland Clinic); Bulacio, Juan (Cleveland Clinic); Gonzalez-Martinez, Jorge (Cleveland Clinic); Sarma, Sridevi V. (Johns Hopkins University); Gale, John (Cleveland Clinic)

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Jamaluddin, Nurul Fauzani (Universiti Putra Malaysia); Siti Anom, Ahmad* (Universiti Putra Malaysia)

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Importance of Muscle Selection for EMG Signal Analysis during Upper Limb Rehabilitation of Stroke Patients

Costa, Álvaro* (Brain Science Institute (BSI) BSI-Toyota Collaboration Center (B)); Itkonen, Matti (Brain Science Institute (BSI), RIKEN); Yamasaki, Hiroshi (Brain Science Institute (BSI) BSI-Toyota Collaboration Center (B)); Alnajjar, Fady SK (BTCC, RIKEN); Shimoda, Shingo (RIKEN)

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Furui, Akira* (Hiroshima University); Hayashi, Hideaki (Hiroshima University); Kurita, Yuichi (Hiroshima University); Tsuji, Toshio (Hiroshima University)

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Insausti-Delgado, Ainhoa* (Eberhard Karls University of Tübingen); López-Larraz, Eduardo (University of Tübingen); Bribauer, Niels (Eberhard-Karls-University); Ramos-Murguialday, Ander (Eberhard Karls University of Tubingen/TECNALIA)

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Wang, Wei (School of Control Science and Engineering, Shandong University); Li, Ke* (Shandong University); Wei, Na (Dept. of Geriatrics, Qilu Hospital, Shandong University); Yin, Cuiping (Dept. of Physical Medicine and Rehabilitation, Qilu Hospital); Yue, Shouwei (Dept. of Physical Medicine and Rehabilitation, Qilu Hospital)

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Oshita, Kazushige* (Kyushu Kyritsu University); Yano, Sumio (Kobe University)

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Li, Yuqi* (City Univ. of Hong Kong); Jelfs, Beth (RMIT Univ.); Chan, Rosa H. M. (City Univ. of Hong Kong)

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Tran, Nguyen Bao* (Tokyo University of Agriculture and Technology); Yano, Shiro (Tokyo University of Agriculture and Technology); Kondo, Toshiyuki (Tokyo University of Agriculture and Technology)
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Azab, Ahmed* (University of Sheffield); Arvaneh, Mahnaz (University of Sheffield); Mihaylova, Lyudmila (University of Sheffield)

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Guo, Meng (Beihang University); Chu, Zhaowei (Beihang University); Yao, Jie (Beihang University); Feng, Wentao (Beihang University); Wang, Lizhen (Beihang University); Fan, Yubo* (Beihang University)

In Silico Investigation of the Effects of Hemolysis on the Hyperspectral Absorptance of Blood in Motion
Van Leeuwen, Spencer Richard* (University of Waterloo); Baranoski, Gladimir Valerio Guimaraes (University of Waterloo); Kimmel, Bradley William (University of Waterloo)
**Pharmacokinetics, Systems Biology, and Synthetic Biology I (Poster Session)**

**16:10-16:12**  
**A Physiologically-Based Pharmacokinetic Model of Methotrexate Incorporating Hepatic Excretion via Multidrug-Resistance-Associated Protein 2 (Mrp2) in Mice, Rats, Dogs, and Humans**  
Lohitnavy, Manupat* (Naresuan University); Lu, Yasong (Dept. of Environmental & Radiological Health Sciences, Colo); Lohitnavy, Ornrat (Center of Excellence for Environmental Health and Toxicology, Na); Yang, Raymond (Dept. of Environmental & Radiological Health Sciences, Colo)

**16:12-16:14**  
**Development of a Physiologically based Pharmacokinetic Model of Paraquat**  
Lohitnavy, Manupat* (Naresuan Univ.); Chitsakhon, Arnon (Center of Excellence for Environmental Health and Toxicology, Na); Jomprasert, Kritsada (Center of Excellence for Environmental Health and Toxicology, Na); Lohitnavy, Ornrat (Center of Excellence for Environmental Health and Toxicology, Na); Reisfeld, Brad (Colorado State Univ.)

**16:10-16:12**  
**Remote Monitoring, Distress Detection by Slightest Invasive Systems: Sound Recognition based on Hierarchical I-Vectors**  
ROBIN, Maxime* (UTC, KRG Corporate); Istrate, Dan (UTC); Boudy, Jerome (IT-Sudparis)

**16:12-16:14**  
**An Anchored Dynamic Time-Warping for Alignment and Comparison of Swallowing Acoustic Signals**  
Rosa, Marcelo* (Universidade Tecnológica Federal do Paraná); Fugmann, Elmar Allen (Universidade Federal do Paraná); Santana, Gisele (Ufpr Hc); Nunes, Maria Cristina de Alencar (Federal University of Parana - UFPR)

**16:10-16:12**  
**Analysis of Phonocardiogram Signals through Proactive Denoising using Novel Self-Discriminant Learner**  
Puri, Chetanya* (Research and Innovation, Tata Consultancy Services, India); Singh, Rituraj (TATA Consultancy Services); Bandyopadhyay, Soma (TATA Consultancy Services); Ukil, Arijit (TATA Consultancy Services); Mukherjee, Ayan (Tata Consultancy Services)

**16:10-16:12**  
**A Multichannel Acoustic Approach to Define a Pulmonary Pathology as Combined Pulmonary Fibrosis and Emphysema Syndrome**  
Santiago-Fuentes, Laura Mercedes (Universidad Autónoma Metropolitana); Charleston-Villalobos, Sonia* (Universidad Autonoma Metropolitana); Gonzalez-Camarena, Ramon (Universidad Autonoma Metropolitana); Mejía Avila, Mayra (Instituto Nacional de Enfermedades Respiratorias); Mateos-Toledo, Heidegger (National Institute of Respiratory Diseases); Buendia-Roldan, Ivette (National Institute of Respiratory Diseases); Aljama-Corrales, Tomas (Universidad Autonoma Metropolitana)
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Rocha, Bruno (University of Coimbra); Mendes, Luis (University of Coimbra); Couceiro, Ricardo (University of Coimbra); Henriques, Jorge* (University of Coimbra); de Carvalho, Paula (University of Coimbra); Paiva, Rui Pedro (University of Coimbra)

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### Kernel-Based Adaptive Learning Improves Accuracy of Glucose Predictive Modelling in Type 1 Diabetes: A Proof-of-Concept Study
Georga, Eleni I. (University of Ioannina); Principe, Jose (University of Florida); Rizos, Evangelos C. (Dept. of Internal Medicine, University Hospital of Ioannina); Fotiadis, Dimitrios I.* (University of Ioannina)

### Suppression of Ventilation Artifacts for Gastrointestinal Slow Wave Recordings
Paskaranandavadivel, Niranchan* (The University of Auckland); Alighaleh, Saeed (Auckland Bioengineering Institute, University of Auckland); Du, Peng (The University of Auckland); O’Grady, Gregory (University of Auckland); Cheng, Leo K (The University of Auckland)

### An Adaptive Prediction Method for Signal Fusion
Holland, Alex* (Edwards LifeSciences); Asgari, Shadnaz (California State University, Long Beach)

### Establishing and Validating a New Source Analysis Method using Phase
Chirumamilla, Venkata Chaitanya* (Johannes Gutenberg University, Dept. of Neurology Mainz); Gonzalez-Escamilla, Gabriel (Johannes Gutenberg University); Kumar, Saurabh (Max Planck Institute for Human Cognitive and Brain Sciences, Leu); Longfei, Xiong (Christian Albrechts University Kiel); Groppa, Sergiu (Johannes Gutenberg University); Muthuraman, Muthuraman (Johannes Gutenberg University)

### Evaluating the Effectiveness of Different External Cues on Non-Invasive Brain-Computer Interfaces
Pearce, Sarah* (University of Waterloo); Boger, Jennifer (University of Waterloo); Mrachacz-Kersting, Natalie (Aalborg University); Farina, Dario (Bernstein Center for Computational Neuroscience, University Medic); Jiang, Ning (University of Waterloo)
A Reliable Brain-Computer Interface based on SSVEP using Online Recursive Independent Component Analysis

Chen, Chi-Kuo* (National Chiao Tung University (NCTU); Bureau of Standards, Metrolog); Fang, Wai-Chi (National Chiao Tung University)
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<td>Serial Fusion of Eulerian and Lagrangian Approaches for Accurate Heart-Rate Estimation using Face Videos</td>
<td>Puneet, Gupta* (Tata Consultancy Services Ltd.); Bhowmick, Brojeshwar (Innovation Labs, Tata Consultancy Services Ltd.); Pal, Arpan (Tata Consultancy Services)</td>
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<td>Kyритsis, Konstantinos (Aristotle Univ. of Thessaloniki); Tatli, Christina (Imperial College Business School); Diou, Christos* (Aristotle Univ. of Thessaloniki); Delopoulos, Anastasios (Aristotle Univ. of Thessaloniki)</td>
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<td>Non-Contact Acquisition of Respiration and Heart Rates using Doppler Radar with Time Domain Peak-Detection Algorithm</td>
<td>Yang, Xiaofeng* (The University of Electro-Communications); Sun, Guanghao (The University of Electro-Communications); Ishibashi, Koichiro (The University of Electro-Communications)</td>
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<td>Mohamed Ameen Mashood, Mohamed Abul Hassan* (UTP); Malik, Aamir Saeed (Universiti Teknologi PETRONAS); Fofi, David (Univ. Bourgogne Franche-Com); Saad, Naufal (Universiti Teknologi PETRONAS); Meriaudeau, Fabrice (Universite de Bourgogne)</td>
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Park, Hyunjin* (Sungkyunkwan University)

16:30-16:32 A Deep Learning Approach to Adherence Detection for Type 2 Diabetics .................................................. 2896-2899
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Johansen, Alexander Rosenberg (Technical University of Denmark); Bengtsson, Henrik (Novo Nordisk A/S);
Fraccaro, Marco (Technical University of Denmark); Morup, Morten (DTU Compute)

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Bernarding, Corinna (Saarland University Hospital)
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Measurement of Human Enamel Mechanical Characteristics with Resonant Ultrasound Spectroscopy

Feng, Dandan (Beihang University); Fan, Fan (Beihang University); Wang, Rui (Beihang University); Zhang, Qiang (Beihang University); Niu, Haijun* (Beihang University)

ThDT18-02.3

Estimation of Pulse Rate from Ambulatory PPG using Ensemble Empirical Mode Decomposition and Adaptive Thresholding

Pittara, Melpo* (University of Cyprus); Theocharides, Theocharis (University of Cyprus); Orphanidou, Christina (University of Cyprus)

ThDT18-02.4

Non-Invasive Diagnosis of Non-Alcoholic Fatty Liver Disease (NAFLD) using Ultrasound Image Echogenicity

Benjamin, Alex (MIT); Zubajlo, Rebecca (MIT); Thomenius, Kai Erik (MIT); Dhyani, Manish (Massachusetts General Hospital); Kallianan, Kanakaraju (Massachusetts General Hospital - Harvard University); Samir, Anthony Edward (Harvard Medical School, Massachusetts General Hospital); Anthony, Brian W.* (Massachusetts Institute of Technology)

ThDT18-02.5

Comparison of Electrohysterogram Characteristics during Uterine Contraction and Non-Contraction during Labor

Liu, Zihui (Beijing Univ. of Technology); Hao, Dongmei* (Beijing Univ. of Technology); Zhang, Lei (Beijing Univ. of Technology); Liu, Juntao (Peking Union Medical College Hospital); Zhou, Xiya (Peking Union Medical College Hospital); Yang, Lin (Beijing Univ. of Technology); Yang, Yimin (Beijing Univ. of Technology); Li, Xuping (Beijing Univ. of Technology); Zhang, Song (Beijing Univ. of Technology); Zheng, Dingchang (Anglia Ruskin Univ.)

ThDT18-02.6

Performance Comparison of Wavelet based Denoising Methods on Discontinuous Adventitious Lung Sounds

Ulukaya, Sezer* (Bogazici University / Trakya University); Serbes, Gorkem (Yildiz Technical University); Kahya, Yasemin P. (Bogazici University)

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Analysis of Dynamic Antral Scintigraphy using Empirical Mode Decomposition

Ngamsirijit, Panasun (Faculty of Engineering, Chulalongkorn University); Jarumaneeroj, Pisit (Chulalongkorn University); Chaiwatanarat, Tawatchai (Faculty of Medicine, Chulalongkorn University); Rakvongthai, Yothin* (Faculty of Medicine, Chulalongkorn University)

ThDT18-02.8

Feature Reconstruction of LFP Signals based on PLSR in the Neural Information Decoding Study

Dong, Yonghui* (Zhengzhou Univ.); Shang, Zhigang (Zhengzhou Univ.); Li, Mengmeng (Zhengzhou Univ.); Liu, Xinyu (Zhengzhou Univ.); Wan, Hong (Zhengzhou Univ.)

ThDT18-02.9

Gender Differences in Dynamic Functional Connectivity based on Resting-State fMRI

Mao, Nini (Beijing Normal University); Zheng, Hongna (Beijing Normal University); Long, Zhiying (Beijing Normal University); Li, Yao (College of Information Science and Technology, Beijing Normal Un); Xia, Wu* (Beijing Normal University.)

ThDT18-02.10

Physical Activity Classification using Time-Frequency Signatures of Motion Artifacts in Multi-Channel Electrical Impedance Plethysmographs

Khan, Hassan Aqeel* (National University of Sciences & Technology); Gore, Amit (GE Global Research); Ashe, Jeffrey (GE Global Research); Chakrabarty, Shantanu (Washington University in Saint Louis Missouri)

ThDT18-02.12

Variation-Based Sparse Source Imaging in Localizing Uterine Activity

Zahran, Saeed* (Université de technologie de Compiègne); Yochum, Maxime (Université de Rennes 1); Diab, Ahmad (Université de technologie de Compiègne - UTC); Khalil, Mohamad (Lebanese Univ., Doctoral School for Sciences and Technology.); Marque, Catherine (Univ. of technology of compiegne)
### Friday, 14 July 2017

#### FrAT1: 08:00-09:30
**Roentgen Hall**

**Signal Pattern Classification – Brain Computer Interface** *(Oral Session)*  
**Chair:** Guan, Cuntai *(Nanyang Technological University)*

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<td><strong>Evaluation of Filtering Techniques to Extract Movement Intention Information from Low-Frequency EEG Activity</strong></td>
<td>Bibián, Carlos <em>(Univ. Tübingen)</em>; López-Larraz, Eduardo* <em>(Univ. of Tübingen)</em>; Irastorza-Landa, Nerea <em>(Univ. of Tübingen)</em>; Birbaumer, Niels <em>(Eberhard-Karls-Univ.)</em>; Ramos-Murguiadlay, Ander <em>(Eberhard Karls Univ. of Tubingen/TECNALIA)</em></td>
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<td><strong>Reject Option to Improve Decoding Accuracy for EEG-Motor Imagery based BCI</strong></td>
<td>M, Ganeshkumar <em>(National University of Singapore (NUS))</em>; So, Rosa* <em>(Institute for Infocomm Research)</em>; Ang, Kai Keng <em>(Institute for Infocomm Research)</em>; Guan, Cuntai <em>(Nanyang Technological University)</em></td>
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<td><strong>Decoding Complex Imagery Hand Gestures</strong></td>
<td>Mohseni Salehi, Seyed Sadegh* <em>(Northeastern University)</em>; Moghadamfalahi, Mohammad <em>(Northeastern University)</em>; Quivira, Fernando <em>(Northeastern University)</em>; Piers, Alexander <em>(Northeastern University)</em>; Nezamfar, Hooman <em>(Northeastern University)</em>; Erdogmus, Deniz <em>(Northeastern University)</em></td>
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<td><strong>Context-Aware Recursive Bayesian Graph Traversal in BCIs</strong></td>
<td>Mohseni Salehi, Seyed Sadegh* <em>(Northeastern University)</em>; Moghadamfalahi, Mohammad <em>(Northeastern University)</em>; Nezamfar, Hooman <em>(Northeastern University)</em>; Haghighi, Marzieh <em>(Northeastern University)</em>; Erdogmus, Deniz <em>(Northeastern University)</em></td>
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<td><strong>Motor Imagery Classification of Upper Limb Movements based on Spectral Domain Features of EEG Patterns</strong></td>
<td>Samuel, Oluwarotimi Williams <em>(Shenzhen Institutes of Advanced Tech.)</em>; Li, Xiangxin <em>(Shenzhen Institutes of Advanced Tech., Chinese Academy of Sc)</em>; Geng, Yanjuan <em>(Shenzhen Institutes of Advanced Tech.)</em>; Fang, Peng <em>(Shenzhen Institutes of Advanced Tech., Chinese Academy of S)</em>; Chen, Shixiong <em>(Shenzhen Institutes of Advanced Tech.)</em>; Li, Guanglin* <em>(Shenzhen Institutes of Advanced Tech.)</em></td>
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<td><strong>A Robust Beamforming Approach for Early Detection of Readiness Potential with Application to Brain-Computer Interface Systems</strong></td>
<td>Mahmoodi, Maryam <em>(Tehran Univ. of Medical Sciences)</em>; Makki Abadi, Bahador* <em>(Tehran Univ. of Medical Sciences)</em>; Khajehpour, Hassan <em>(Tehran Univ. of Medical Sciences)</em>; Harirchian, Mohammad Hosein <em>(Medical Sciences/Univ. of Tehran)</em></td>
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FrAT2: 08:00-09:30
Ultrasound Imaging – Elastography I (Oral Session)
Chair: Managuli, Ravi (Hitachi Aloka Medical America, Inc.)
Co-Chair: Yoo, Yangmo (Sogang University)

08:00-08:15
ARFI Variance of Acceleration (VoA) for Noninvasive Characterization of Human Carotid Plaques in Vivo .... 2984-2987
Torres, Gabriela* (Univ. of North Carolina at Chapel Hill and North Carolina S); Czernuszewicz, Tomasz (Univ. of North Carolina at Chapel Hill); Homeister, Jonathon (Univ. of North Carolina at Chapel Hill); Farber, Mark (Univ. of North Carolina at Chapel Hill); Gallippi, Caterina (The Univ. of North Carolina at Chapel Hill)

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Guo, Yanrong (Shenzhen Univ.); Lin, Haoming (Shenzhen Univ.); Zhang, Xin-Yu (Shenzhen Univ.); Wen, Huiying (Shenzhen Univ.); Chen, Siping (Shenzhen Univ.); Chen, Xin* (Shenzhen Univ.)

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Application of Compressive Sensing to Portable Ultrasound Elastography .................................. 2992-2995
Shin, Bonghun Shin (University of Waterloo); Jeon, Soo (University of Waterloo);
Ryu, Jeongwon (Healerion Inc.); Kwon, Hyock Ju* (University of Waterloo)

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Radiofrequency Ultrasound Data Acquisition with a 640-Element Array Transducer for Strain Imaging: Experimental Results with Phantoms and Biological Tissue Samples .................................. 2996-2999
Brusseau, Elisabeth* (CREATIS); Bernard, Adeline (CREATIS); Meynier, Cyril (VERMON);
Ferin, Guillaume (VERMON); Nguyen-Dinh, An (VERMON); Basset, Olivier (CREATIS)

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Measurement of Surface Acoustic Waves in High-Frequency Ultrasound: Preliminary Results ............... 3000-3003
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Arroyo, Junior* (Pontificia Univ. Católica del Perú); Castañeda, Benjamín (Pontificia Univ. Católica del Perú)

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MRI Neuroimaging (Oral Session)
Chair: Wang, Yi (Cornell University)
Co-Chair: Wang, Ze (Temple University)

08:00-08:15
Central Sulcus Depth and Sulcal Profile Differences between Congenitally Blind and Sighted Individuals .. 3008-3011
James, Clarissa* (University of Southern California); Lepore, Franco (University of Montreal); Collignon, Olivier (Université Catholique de Louvain); Lepore, Natasha (University of Southern California / Children's Hospital Los Ange); Coulon, Olivier (Aix-Marseille University)

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MRI based Objective Ischemic Core-Penumbra Quantification in Adult Clinical Stroke ......................... 3012-3015
Vupputuri, Anusha* (Indian Institute of Technology Kharagpur); Ashwal, Stephen (Dept. of Pediatrics, Loma Linda University); Tsao, Bryan (Dept. of Neurology, Loma Linda University); Haddad, Elia (Dept. of Neurology, Loma Linda University); Ghosh, Nirmalya (Indian Institute of Technology Kharagpur)

08:30-08:45
Brain Functional Connectivity Alterations in a Rat Model of Excessive Alcohol Drinking:
A Resting-State Network Analysis ................................................................. 3016-3019
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**08:45-09:00 FrAT3.4**

**Difference of Alzheimer's Disease Sub-Groups using Two Features from Intensity Size Zone Matrix**

Lee, Seunghak (Sungkyunkwan Univ.); Park, Hyunjin* (Sungkyunkwan University)

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**09:00-09:15 FrAT3.5**

**Early Axonal Damage in Normal Appearing White Matter in Multiple Sclerosis:**

Novel Insights from Multi-Shell Diffusion MRI

De Santis, Silvia (Universidad Miguel Hernandez de Elche); Granberg, Tobias (Karolinska Institute); Ouellette, Russell (Dept. of Radiology, Athinoula A. Martinos Center for Biomed); Treaba, Constantina (Dept. of Radiology, Athinoula A. Martinos Center for Biomed); Fan, Qiuyun (Dept. of Radiology, Athinoula A. Martinos Center for Biomed); Herranz, Elena (Athinoula A. Martinos Center for Biomedical Imaging); Mainiero, Caterina (Dept. of Radiology, Athinoula A. Martinos Center for Biomed); Toschi, Nicola* (University of Rome "Tor Vergata", Faculty of Medicine)

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**09:15-09:30 FrAT3.6**

**Brain Age Estimation from T1-Weighted Images using Effective Local Features**

Fujimoto, Ryuichi* (Tohoku University); Ito, Koichi (Tohoku University); Wu, Kai (South China University of Technology); Sato, Kazunori (Tohoku University); Taki, Yasuyuki (Tohoku University); Fukuda, Hiroshi (Tohoku Pharmaceutical University); Aoki, Takafumi (Tohoku University)

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**08:30-08:45 FrAT4.3**

**Wideband Phantoms of Different Body Tissues for Heterogeneous Models in Body Area Networks**

Castelló-Palacios, Sergio (Universitat Politècnica de Valencia); Garcia-Pardo, Concepcion (Universidad Politécnica de Valencia); Forés-Leal, Alejandro (Universitat Politècnica de Valencia); Cardona, Narcis (Universitat Politècnica de València); Vallés-Lluch, Ana* (Universitat Politècnica de València)

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**08:45-09:00 FrAT4.4**

**A Wireless Capsule Endoscopy Steering Mechanism using Magnetic Field Platform**

Alsunaydih, Fahad Nasser* (Monash University); Redouté, Jean-Michel (Monash University); Yuce, Mehmet (Monash University)

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**09:00-09:15 FrAT4.5**

**A Swallowable Sensing Device Platform with Wireless Power Feeding and Chemical Reaction Actuator**

Nakamura, Ryota* (Kobe University); Izumi, Shintaro (Kobe University); Kawaguchi, Hiroshi (Kobe University); Ohta, Hidetoshi (Sapporo Orthopedics and Cardiovascular Hospital); Yoshimoto, Masahiko (Kobe University)

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**08:00-09:00 Min Room FrAT4**

**Body Sensor Networks – Molecules, Radio, and Machine Learning – I (Invited Session)**

Chair: Balasingham, Ilangko (Oslo University Hospital and Norwegian University of Science and Technology)
Co-Chair: Anzai, Daisuke (Nagoya Institute of Technology)

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**08:00-09:30 Min Room FrAT4**

**Detection of Turning Freeze in Parkinson's Disease based on S-Transform Decomposition of EEG Signals**

Ly, Quynh Tran* (University of Technology Sydney); Handojoseno, Aluysius Maria Ardi (University of Technology, Sydney); Gilat, Moran (Parkinson's Disease Research Clinic, Brain and Mind Research Ins); Chai, Rfai (University of Technology, Sydney); Ehgoetz Martens, Kaylena (University of Sydney); Georgiades, Matthew (University of Sydney); Naik, Ganesh R (University of Technology Sydney); Tran, Yvonne (University of Technology, Sydney); Lewis, Simon J.G. (Parkinson's Disease Research Clinic, Brain and Mind Research Ins); Nguyen, Hung T. (University of Technology, Sydney)
Detection of Gait Initiation Failure in Parkinson’s Disease based on Wavelet Transform and Support Vector Machine

Ly, Quynh Tran* (University of Technology Sydney); Handojesono, Aluysius Maria Ardi (University of Technology, Sydney); Gilat, Moran (Parkinson’s Disease Research Clinic, Brain and Mind Research Ins); Chai, Rifai (University of Technology, Sydney); Ehgoetz Martens, Kaylena (University of Sydney); Georgiades, Matthew (University of Sydney); Naik, Ganesh R (University of Technology Sydney); Tran, Yvonne (University of Technology, Sydney)
08:45-09:00 FrAT8.4
Classification of Low-Grade and High-Grade Glioma using Multi-Modal Image Radiomics Features
Cho, Hwan-ho (Sungkyunkwan University); Park, Hyunjin* (Sungkyunkwan University)

09:00-09:15 FrAT8.5
Contribution to Speech Development of the Right Anterior Putamen Revealed with Multivariate Tensor-Based Morphometry
Vlasova, Roza* (CIBORG Lab, Dept. of Radiology, Children's Hospital Los Angeles); Wang, Yalin (Arizona State University); Dirks, Holly (Brown University); Dean, Douglas (University of Wisconsin-Madison);
O'Muircheartaigh, Jonathan (Brown University); Gonzalez, Sara (CIBORG Lab, Dept. of Radiology, Children's Hospital Los Angeles); Nguyen, Binh Kien (CIBORG Lab, Dept. of Radiology, Children's Hospital Los Angeles);
Nelson, Marvin (University of Southern California and Keck School of Medicine); Deoni, Sean (University of Colorado); Lepore, Natasha (University of Southern California / Children's Hospital Los Angeles)

FrAT10: 08:00-09:30 Schmitt Room
General and Theoretical Informatics – Machine Learning I (Oral Session)
Chair: Kim, Yongwook Bryce (Massachusetts Institute of Technology)
Co-Chair: Ikeda, Kazushi (Nara Institute of Science and Technology)

08:00-08:15 FrAT10.1
Collision Frequency Locality-Sensitive Hashing for Prediction of Critical Events
Kim, Yongwook Bryce* (Massachusetts Institute of Technology); Hemberg, Erik (MIT CSAIL); O'Reilly, Una-May (Massachusetts Institute of Technology)

08:15-08:30 FrAT10.2
Optimized Automatic Sleep Stage Classification using the Normalized Mutual Information Feature Selection (NMIFS) Method
Cho, Dongrae* (Gwangju Institute of Science and Technology); Lee, Boreom (Gwangju Institute of Science and Technology (GIST))

08:30-08:45 FrAT10.3
Application of SsVGMM to Medical Data – Classification with Novelty Detection
Yang, Fan (Nara Institute of Science and Tech.); Soriano, Jaymar (Nara Institute of Science and Tech.); Kubo, Takatomii* (Nara Institute of Science and Tech.); Ikeda, Kazushi (Nara Institute of Science and Tech.)

08:45-09:00 FrAT10.4
Ensemble Transfer Learning for Alzheimer's Disease Diagnosis
Colbaugh, Richard (Periander Ltd); Glass, Kristin* (Periander Ltd); Gallegos, Gil (New Mexico Highlands Univ.)

09:00-09:15 FrAT10.5
Learning about Individuals’ Health from Aggregate Data
Colbaugh, Richard (Periander Ltd); Glass, Kristin* (Periander Ltd)

09:15-09:30 FrAT10.6
Comparing Deep Neural Network and Other Machine Learning Algorithms for Stroke Prediction in a Large-Scale Population-Based Electronic Medical Claims Database
Hung, Chen-Ying (National Tsing Hua Univ.); Chen, Wei-Chen (Dept. of Electrical Engineering, National Tsing Hua Univ.); Lai, Po-Tsun (Dept. of Electrical Engineering, National Tsing Hua Univ.); Lin, Ching-Heng (Dept. of Medical Research, Taichung Veterans General Hospital); Lee, Chi-Chun* (National Tsing Hua Univ.)

FrAT11: 08:00-09:30 Greatbatch Room
Cardiovascular Variability (Oral Session)
Chair: Lee, Boreom (Gwangju Institute of Science and Technology (GIST))

08:00-08:15 FrAT11.1
Evaluating the Association between Cardiac and Peripheral Resistance Arms of the Baroreflex
Porta, Alberto* (Univ. degli Studi di Milano); Bari, Vlasta (IRCCS Policlinico San Donato); Ranuzzi, Giovanni (Dept. of Cardiothoracic, Vascular Anesthesia and Intensive); De Maria, Beatrice (IRCCS Fondazione Salvatore Maugeri, Milano); Malacarne, Mara (Dipartimento di Biotecnologie Mediche e Medicina Traslazionale); Pagani, Massimo (Univ. degli studi di Milano); Lucini, Daniela (Univ. degli studi di Milano)
08:15-08:30  
FrAT11.2  
**Changes in Heart Rate Variability of Patients with Delirium in Intensive Care Unit**  
[3118-3121]  
Oh, Jooyoung* (Gwangju Institute of Science and Technology); Cho, Dongrae (Gwangju Institute of Science and Technology); Kim, Jongin (Gwangju Institute of Science and Technology); Heo, Jaeseok (Yonsei University); Park, Jaesub (Yonsei University); Na, Se Hee (Yonsei University); Shin, Cheung Soo (Yonsei University); Kim, Jae-Jin (Yonsei University); Park, Jin Young (Yonsei University); Lee, Boreom (Gwangju Institute of Science and Technology (GIST))

08:30-08:45  
FrAT11.3  
**A Stochastic and Mathematically Integrative Model of the Control of Human Heart Rate**  
[3122-3125]  
BuSha, Brett* (The College of New Jersey)

08:45-09:00  
FrAT11.4  
**Towards the Identification of Subjects Prone to Develop Atrial Fibrillation after Coronary Artery Bypass Graft Surgery via Univariate and Multivariate Complexity Analysis of Heart Period Variability**  
[3126-3129]  
Bari, Vlasta* (IRCCS Policlinico San Donato); Ranucci, Marco (Dept. of Cardiothoracic, Vascular Anesthesia and Intensive); De Maria, Beatrice (IRCCS Fondazione Salvatore Maugeri, Milano); Ranuzzi, Giovanni (Dept. of Cardiothoracic, Vascular Anesthesia and Intensive); Pistuddi, Valeria (Dept. of Cardiothoracic, Vascular Anesthesia and Intensive); Porta, Alberto (Università degli Studi di Milano)

09:00-09:15  
FrAT11.5  
**Respiratory-Gated Auricular Vagal Afferent Nerve Stimulation (RAVANS) Effects on Autonomic Outflow in Hypertension**  
[3130-3133]  
Sclocco, Roberta* (Massachusetts General Hospital, Harvard Medical School); Garcia, Ronald (Massachusetts General Hospital); Gabriel, Aileen (Brigham and Women's Hospital); Kettner, Norman (Logan College of Chiropractic); Napadow, Vitaly (Massachusetts General Hospital); Barbieri, Riccardo (Politecnico di Milano)

09:15-09:30  
FrAT11.6  
**Multiscale Sample Entropy of Heart Rate and Blood Pressure: Methodological Aspects**  
[3134-3137]  
Castiglioni, Paolo* (Fondazione Don Carlo Gnocchi ONLUS); Brambilla, Lorenzo (Fondazione Don Carlo Gnocchi, Parma, Italy); Bini, Matteo (Dept. of Clinical and Experimental Medicine); Coruzzi, Paolo (Dept. of Clinical and Experimental Medicine); Faini, Andrea (Istituto Auxologico Italiano)

08:00-09:30  
FrAT14  
**Image Classification I** (Oral Session)

08:00-08:15  
FrAT14.1  
**CAD for Prostate Cancer Detection based on Multiparametric Data**  
[3138-3141]  
Meriaudeau, Fabrice* (Universite de Bourgogne); Lemaire, Guillaume (LE2I - UMR 6306); Ratsgoo, Mojdeh (LE2I - UMR 6306); Martí, Robert (University of Girona)

08:15-08:30  
FrAT14.2  
**Detecting Impaired Vision Caused by AMD from Gaze Data**  
[3142-3145]  
Liu, Huiying* (Institute for Infocomm Research); Xu, Yanwu (Institute for Infocomm Research); Wong, Damon (Institute for Infocomm Research); Yow, Ai Ping (Institute for Infocomm Research); Laude, Augustinus (Tan Tock Seng Hospital); Lim, Tock Han (Tan Tock Seng Hospital)

08:30-08:45  
FrAT14.3  
**Gabor-Based Automatic Spinal Level Identification in Ultrasound**  
[3146-3149]  
Ikhsan, Mohammad* (National University of Singapore); Tan, Kok Kiong (National University of Singapore); Oh, Ting Ting (KK Women's and Children's Hospital); Sng, Ban Leong (KK Women's and Children's Hospital); Lew, John Paul (KK Women's and Children's Hospital)

08:45-09:00  
FrAT14.4  
**Image Recognition with Missing-Features based on Gaussian Mixture Model and Graph Constrained Nonnegative Matrix Factorization**  
[3150-3153]  
Zhang, Zhuyan (East China University of Science and Technology); Zhu, Hongqing* (East China University of Science and Technology); Tao, Xuan (East China University of Science and Technology)
**Gastrointestinal Bleeding Detection in Wireless Capsule Endoscopy Images using Handcrafted and CNN Features**  
Jia, Xiao* (The Chinese University of Hong Kong); Meng, Max Q.-H. (The Chinese University of Hong Kong)  
FrAT14.5  
3154-3157

**Automated Angiodysplasia Detection from Wireless Capsule Endoscopy**  
Noya, Ferran (Automatic Control Dept., Univ. Politécnica de Catalun); Álvarez-González, Marco Antonio (Endoscopy Unit, Dept. of Digestive Diseases, Hospital del M); Benítez, Raúl* (Univ. Politecnica de Catalunya)  
FrAT14.6  
3158-3161

**Intracardiac Electrogram Envelope Detection during Atrial Fibrillation using Fast Orthogonal Search**  
Hashemi, Javad* (Queen's Univ.); Shariat, Mohammad Hassan (Queen's Univ., Kingston, Ontario, Canada); Redfearn, Damian P (Queen's Univ.)  
FrAT17.1  
3162-3165

**Statistical Baseline Assessment in Cardiotocography**  
Agostinelli, Angela (Politecnich Univ. of Marche); Braccili, Eleonora (Univ. Politecnica delle Marche); Marchegiani, Enrico (Univ. Politecnica delle Marche); Rosati, Riccardo (Univ. Politecnica delle Marche); Sbrollini, Agnese (Univ. Politecnica delle Marche); Burattini, Luca (Univ. Politecnica delle Marche); Morettini, Micaela (Univ. Politecnica delle Marche); Di Nardo, Francesco (Polycrtechni Univ. of Marche); Fioretti, Sandro (Univ. Politecnica delle Marche); Burattini, Laura* (Univ. Politecnica delle Marche)  
FrAT17.2  
3166-3169

**Nonlinear Analysis of Heart Rate Variability for the Assessment of Dysphoria**  
Greco, Alberto* (University of Pisa); Messerott Benvenuti, Simone (University of Padova); Gentili, Claudio (University of Pisa); Palomba, Daniela (University of Padova); Valenza, Gaetano (University of Pisa); Scilingo, Enzo Pasquale (University of Pisa)  
FrAT17.3  
3170-3173

**Classification Enhancement for Post-Stroke Dementia using Fuzzy Neighborhood Preserving Analysis with QR-Decomposition**  
Al-Qazzaz, Noor* (UKM); Md Ali, Sawal Hamid (National Univ. of Malaysia); Siti Anom, Ahmad (Univ. Putra Malaysia); Escudero, Javier (Univ. of Edinburgh)  
FrAT17.4  
3174-3177

**Attenuation of Vagal Modulation with Aging: Univariate and Bivariate Analysis of HRV**  
Costa Oliveira Junior, Evandro* (University of Brasilia); Oliveira, Flavia M. G. S. A. (University of Brasilia)  
FrAT17.5  
3178-3181

**Multiscale Dispersion Entropy for the Regional Analysis of Resting-State Magnetoencephalogram Complexity in Alzheimer’s Disease**  
Azami, Hamed (Univ. of Edinburgh); Kinney-Lang, Eli* (Univ. of Edinburgh); Ebied, Ahmed (Univ. of Edinburgh); Fernandez, Alberto (Universidad Complutense de Madrid); Escudero, Javier (Univ. of Edinburgh)  
FrAT18.1  
3182-3185

**Gait Variability Assessment in Neuro-Degenerative Patients by Measuring Complexity of Independent Sources**  
Heydarzadeh, Mehrdad (The University of Texas at Dallas); Nourani, Mehrdad (University of Texas at Dallas); Tan, Chin-Tuan* (University of Texas, Dallas); Ostadabbas, Sarah (Northeastern University)  
FrAT18.2  
3186-3189
Complexity Analysis of Resting State fMRI Signals in Depressive Patients

Ho, Pei-Shan (National Tsing Hua Univ., Hsinchu); Lin, Chemin (Keelung Chang Gung Memorial Hospital); Chen, Guan-Yen (National Tsing Hua Univ.); Liu, Ho-Ling (Univ. of Texas, MD Anderson Cancer Center); Huang, Chih-Mao (National Chiao Tung Univ.); Lee, Tatia Mei-Chun (The Univ. of Hong Kong); Lee, Shwu-Hua (Linkou Chang Gung Memorial Hospital); Wu, Shun Chi* (National Tsing Hua Univ.)

Predicting Learning Dynamics in Multiple-Choice Decision-Making Tasks using a Variational Bayes Technique

Yousefi, Ali* (Massachusetts General Hospital and Harvard Medical School); Kakooee, Reza (Tarbiat Modares University); Hamidi Beheshti, Mohammad Taghi (Tarbiat Modares University); Dougherty, Darin (Massachusetts General Hospital); Eskandar, Emad (Massachusetts General Hospital); Widge, Alik (Massachusetts General Hospital); Eden, Uri (Boston University)

A Closed-Form Unsupervised Geometry-Aware Dimensionality Reduction Method in the Riemannian Manifold of SPD Matrices

Congedo, Marco* (CNRS, University Grenoble Alpes, Grenoble Institute of Technology); Rodrigues, Pedro Luiz Coelho (Escola Politécnica USP); Bouchard, Florent (Gipsa-lab, Univ. Grenoble Alpes); Barachant, Alexandre (Independent Researcher); Jutten, Christian (University of Grenoble)

Real-Time Physiological Tremor Estimation using Recursive Singular Spectrum Analysis

Adhikari, Kabita* (Newcastle University); Tatinati, Sivanagaraja (Nanyang Technological University); Veluvolu, Kalyana C. (Kyungpook National University); Chambers, Jonathon A. (Newcastle University); Nazarpour, Kianoush (Newcastle University)

10:50-12:20 Roentgen Hall

Signal Pattern Classification – EEG I (Oral Session)

Chair: Zhang, Dan (Tsinghua University)

Integrating Channel Selection and Feature Selection in a Real Time Epileptic Seizure Detection System

Wang, Hongda* (The Chinese University of Hong Kong); Shi, Weiwei (Shenzhen University); Choy, Chiu Sing (The Chinese University of Hong Kong)

Evidences of Brain Functional Deficits following Sport-Related Mild Traumatic Brain Injury

Munia, Tamanna Tabassum Khan (University of North Dakota); Haider, Md. Ali (University of North Dakota); Fazel-Rezai, Reza* (University of North Dakota)

Estimating Unmeasured Invasive EEG Signals using a Reduced-Order Observer

Gunnarsdottir, Kristin* (Johns Hopkins Univ.); Li, Adam (Neuromedical Control Systems Laboratory); Bulacio, Juan (Cleveland Clinic); Gonzalez-Martinez, Jorge (Cleveland Clinic); Sarma, Sridevi V. (Johns Hopkins Univ.)

A Mental Fatigue Index based on Regression using Multiband EEG Features with Application in Simulated Driving

Dimitrakopoulos, Georgios (Univ. of Patras); Kakkos, Ioannis (National Univ. Singapore); Thakor, Nitish (Johns Hopkins Univ.); Bezerianos, Anastasios* (National Univ. of Singapore); Sun, Yu (National Univ. of Singapore)

Decoding Brain Cognitive Activity across Subjects using Multimodal M/EEG Neuroimaging

Fatima, Sarwat (National University of Science and Technology); Kamboh, Awais Mehmoody* (School of Electrical Engineering and Computer Science, National)
**EEG-Based Approach-Withdrawal Index for the Pleasantness Evaluation during Taste Experience in Realistic Settings**

Di Flumeri, Gianluca* (University of Rome Sapienza); Arico, Pietro (Fondazione Santa Lucia); Borghini, Gianluca (University of Rome Sapienza); Sciaraffa, Nicolina (Dept. of Computer, Control and Management Engineering); Maglione, Anton Giulio (University of Rome Sapienza); Rossi, Dario (University of Rome Sapienza); Modica, Enrica (University of Rome Sapienza); Mascarell Llorens, Ignacio (Dept. of Clinical and Experimental Neuroscience); Trettel, Arianna (BrainSigns); Babiloni, Fabio (University of Rome); Colosimo, Alfredo (University of Rome"Sapienza"); Herrero Exquerro, Maria Trinidad (University of Murcia)

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**FrBT2: 10:50-12:20**

**Innovative Ultrasound Imaging** (Oral Session)

**Chair:** Lavarello, Roberto (Pontifica Universidad Catolica del Peru)

**Co-Chair:** Park, Kwan Kyu (Hanyang University)

**10:50-11:05**

**Multimodal Ultrasound Imaging based Diagnosis of Liver Cancers with a Two-Stage Multi-View Learning Framework**

Yiyi, Qian (Shanghai University); Shi, Jun* (Shanghai University); Zheng, Xiao (Shanghai University); Zhang, Qi (Shanghai University); Leihang, Guo (Shanghai Tenth People’s Hospital); Dan, Wang (Shanghai Tenth People’s Hospital); Huixiong, Xu (Shanghai Tenth People’s Hospital)

**11:05-11:20**

**Myocardial Elastogram using a Fast Mapping Algorithm**

Wang, Yinong (Institute of Medical Information, School of Biomedical Engineering); Song, Xiangfen (Institute of Medical Information, School of Biomedical Engineering); Huang, Zhjie (Institute of Medical Information, School of Biomedical Engineering); Wang, Qing* (Southern Medical University)

**11:20-11:35**

**Image-Guided Laparoscopic Pelvic Lymph Node Dissection using Stereo Visual Tracking Free-Hand Laparoscopic Ultrasound**

Ma, Lei* (School of Bioengineering, The Univ. of Tokyo); Nakamae, Kenta (The Univ. of Tokyo); Wang, Junchen (The Univ. of Tokyo); Kiyomatsu, Hidemichi (The Univ. of Tokyo); Tsukihara, Hiroyuki (The Univ. of Tokyo); Kobayashi, Etsuko (The Univ. of Tokyo); Sakuma, Ichiro (The Univ. of Tokyo)

**11:35-11:50**

**Tracking Large Anterior Mitral Leaflet Displacements by Incorporating Optical Flow in an Active Contours Framework**

Sultan, Malik Saad (University of Porto); Martins, Nelson (Enermeter, Sistemas de Medicação, Lda & Instituto de Telecomunicac); Eva, Costa (Enermeter, Sistemas de Medição, Lda, Braga, Portugal); Veiga, Diana Enermeter, Sistemas de Mediçao Lda/ Centro Algoritmi, University); Ferreira, Manuel Joao (University of Minho); Sandra, Mattos (Ciclo do Coracao de Pernambuco, Recife PE, Brazil); Coimbra, Miguel* (Instituto de Telecomunicações / Universidade do Porto)

**11:50-12:05**

**Automatic Initialization for Active Contour Model in Breast Cancer Detection Utilizing Conventional Ultrasound and Color Doppler**

Keatmanee, Chadaporn* (Japan Advanced Institute of Science and Technology (JAIST)); Makhanov, Stanislav (Sriinthorn International Institute of Technology); Kazunori, Kotani (Japan Advanced Institute of Science and Technology (JAIST)); Lohtivisate, Wanrudee (Dept. of Radiology, Thammasat University); Tongvigitmanee, Saowapak (National Electronics and Computer Technology Center)

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**FrBT3: 10:50-12:20**

**MRI Image Reconstruction** (Oral Session)

**Chair:** Qu, Xiaobo (Xiamen University)

**10:50-11:05**

**4D Real-Time Phase-Contrast Flow MRI with Sparse Sampling**

Sun, Aiqi* (Center for Biomedical Imaging Research, Tsinghua University); Zhao, Bo (Martinos Center for Biomedical Imaging, MGH and Harvard Medical); Li, Rui (Tsinghua University); Yuan, Chun (Tsinghua University, Center of Biomedical Imaging Research; Univ)
Fast Dictionary Generation and Searching for Magnetic Resonance Fingerprinting

Xie, Jun (Hangzhou Normal Univ.); Jian, Zhang (Hangzhou Normal Univ.); Lyu, Mengye (Hong Kong Univ.); Hui, Edward S. (The Univ. of Hong Kong); Wu, Ed X. (The Univ. of Hong Kong); Wang, Ze* (Temple Univ.)

Parallel Compressive Sensing in a Hybrid Space: Application in Interventional MRI

Vafay Eslahi, Samira* (Texas A&M University); Dhulipala, Pranav Vaidik (Texas A&M University); Shi, Caiyun (Shenzhen Institutes of Advanced Technology, Lauterbur Research C); Xie, Guoxi (Shenzhen Institutes of Advanced Technology, Lauterbur Research C); Ji, Jim Xiuquan (Texas A&M University)

Simultaneous Multislice Magnetic Resonance Fingerprinting with Low-Rank and Subspace Modeling

Zhao, Bo* (MGH/HST Athinoula Martinos Center for Biomedical Imaging, Harvar); Bilgic, Berkin (Martinos Center for Biomedical Imaging); Adalsteinsson, Elfar (MIT/MGH Martinos Center); Griswold, Mark (Case Western Reserve University); Wald, Lawrence L. (A. A. Martinos Center for Biomedical Imaging, Dept. of Radiology); Setsompop, Kawin (Harvard Medical School)

A Low Rank Hankel Matrix Reconstruction Method for Ultrafast Magnetic Resonance Spectroscopy

Lu, Hengfa (Xiamen Univ.); Zhang, Xinlin (Xiamen Univ.); Qiu, Tianyu (Xiamen Univ.); Yang, Jian (Xiamen Univ.); Guo, Di (Xiamen Univ. of Technology); Chen, Zhong (Xiamen Univ.); Qu, Xiaobo* (Xiamen Univ.)

Flexible Wearable Sensor Nodes with Solar Energy Harvesting

Wu, Taiyang* (Monash University); Arefin, Md Shamsul (Monash University); Redouté, Jean-Michel (Monash University); Yuce, Mehmet (Monash University)

Comparison of Hand-Craft Feature based SVM and CNN based Deep Learning Framework for Automatic Polyp Classification

Shin, Younghak* (NTNU (Norwegian University of Science and Technology)); Balasigham, Ilangko (Oslo University Hospital and Norwegian University of Science and Technology)

A Wearable Autonomous Heart Rate Sensor based on Piezoelectric-Charge-Gated Thin-Film Transistor for Continuous Multi-Point Monitoring

Rasheed, Ahmed (Sun Yat-Sen University (SYSU)-Carnegie Mellon University (CMU) J); Irammanesh, Emad (SYSU-CMU, JIE); Wang, Kai* (Sun Yat-Sen University)

Low Group Delay Signal Conditioning for Wearable Central Blood Pressure Monitoring Device

Fierro, Germán (Universidad de la Republica); Silveira, Fernando* (Universidad de la Republica); Armentano, Ricardo Luis (Republic University)

Hemodynamic Sensing of 3D Fingertip Force using PPG Device on Proximal Part

Yoshimoto, Shunsuke* (Osaka University); Hinatsu, Shun (Osaka University); Kuroda, Yoshihiro (Osaka University); Oshiro, Osamu (Osaka University)
Tarsusmeter: Development of a Wearable Device for Ankle Joint Impedance Estimation

Hassan, Modar* (University of Tsukuba); Yagi, Keisuke (University of Tsukuba); Hsiao, Kaiwen (University of Tsukuba); Mochiyama, Hiromi (University of Tsukuba); Suzuki, Kenji (University of Tsukuba)

Development of a Smartphone-Based Pulse Oximeter with Adaptive SNR/Power Balancing

Phelps, Thomas (University of California, San Diego); Jiang, Haowei (University of California San Diego); Hall, Drew* (University of California, San Diego)

Measurement of Heartbeat Intervals in a Sitting Position using Multiple Piezoelectric Sensors with Body Movement Reduction

Igasaki, Tomohiko* (Kumamoto University); Shimai, Shogo (Kumamoto University); Kobayashi, Makiko (Kumamoto University)

FrBT8: 10:50-12:20

Brain Networks and Connectivity (Oral Session)

Chair: Barbieri, Riccardo (Politecnico di Milano)

Dynamical Brain Connectivity Estimation using GARCH Models: An Application to Personality Neuroscience

Riccelli, Roberta (Lab. of Neuromotor Physiology, IRCCS Santa Lucia Foundatio); Passamonti, Luca (Univ. of Cambridge); Duggento, Andrea (Univ. of Rome “Tor Vergata”); Guerrisi, Maria (Univ. of Rome “Tor Vergata”); Indovina, Iole (Lab of Neuromotor Physiology, IRCCS Santa Lucia Foundation); Terracciano, Antonio (Dept. of Geriatrics, Florida State Univ. College of Med); Toschi, Nicola* (Univ. of Rome “Tor Vergata”, Faculty of Medicine)

Dynamic Inter-Network Connectivity in the Human Brain

Riccelli, Roberta (Laboratory of Neuromotor Physiology, IRCCS Santa Lucia Foundatio); Passamonti, Luca (University of Cambridge); Duggento, Andrea* (University of Rome “Tor Vergata”); Guerrisi, Maria (University of Rome “Tor Vergata”); Indovina, Iole (Laboratory of Neuromotor Physiology, IRCCS Santa Lucia Foundation); Toschi, Nicola (University of Rome “Tor Vergata”, Faculty of Medicine)

Resting-State Brain Correlates of Cardiovascular Complexity

Valenza, Gaetano (University of Pisa); Duggento, Andrea (University of Rome “Tor Vergata”); Passamonti, Luca (University of Cambridge); Diciotti, Stefano (Alma Mater Studiorum, University of Bologna); Tessa, Carlo (Versilia Hospital, Azienda USL 12 Viareggio); Toschi, Nicola (University of Rome “Tor Vergata”, Faculty of Medicine); Barbieri, Riccardo* (Politecnico di Milano)

Cognitive Control Related Network Analysis a Novel Way to Measure Neuron Fiber Connection of Alzheimer's Disease

Zhang, Changle (Harbin Institute of Technology Shenzhen Graduate School); Chai, Tao (Harbin Institute of Technology); Mao, Shuai (Harbin Institute of Technology Shenzhen Graduate School); Gao, Na (Harbin Institute of Technology); Ma, Heather Ting* (Harbin Institute of Technology Shenzhen Graduate School)

Resting-State Brain Correlates of Instantaneous Autonomic Outflow

Valenza, Gaetano (University of Pisa); Duggento, Andrea (University of Rome “Tor Vergata”); Passamonti, Luca (University of Cambridge); Diciotti, Stefano (Alma Mater Studiorum, University of Bologna); Tessa, Carlo (Versilia Hospital, Azienda USL 12 Viareggio); Barbieri, Riccardo (Politecnico di Milano); Toschi, Nicola* (University of Rome “Tor Vergata”, Faculty of Medicine)
**FrBT9: 10:50-12:20**

**Neural Signal Processing I (Oral Session)**

**Chair:** Li, Haifeng (Harbin Institute of Technology)

**Co-Chair:** Santaniello, Sabato (University of Connecticut)

10:50-11:05 FrBT9.1

**A Model Study of the Neural Interaction via Mutual Coupling Factor Identification** ........................................... 3329-3332

Zhang, Qichun (University of Essex); Sepulveda, Francisco* (University of Essex)

11:05-11:20 FrBT9.2

**On Electrophysiological Signal Complexity during Biological Neuronal Network Development and Maturation** .................................... 3333-3338

Kapucu, Fikret Emre* (Tampere University of Technology); Vornaman, Inkeri (Tampere University of Technology); Christophe, Francois (Tampere University of Technology); Tanskanen, Jarno M. A. (Tampere University of Technology); Johansson, Julia (Tampere University of Technology); Mikkonen, Tommi (Tampere University of Technology); Hyttinen, Jari (Tampere University of Technology)

11:20-11:35 FrBT9.3

**Nonmotor Regions Encode Path-Related Information during Movements** ......................................................... 3339-3342

Breault, Macauley S.* (Johns Hopkins University); Sacré, Pierre (Johns Hopkins University); Johnson, Jacob J. (Indian Institute of Technology Guwahati); Kerr, Matthew (Johns Hopkins University); Johnson, Matthew (Cleveland Clinic); Bulacio, Juan (Cleveland Clinic); Gonzalez-Martinez, Jorge (Cleveland Clinic); Sarma, Sridevi V. (Johns Hopkins University); Gale, John (Cleveland Clinic)

11:35-11:50 FrBT9.4

**Importance of Vesicle Release Stochasticity in Neuro-Spike Communication** ....................................................... 3343-3347

Ramezani, Hamideh* (Koc University); Akan, Ozgur B. (Koc University)

11:50-12:05 FrBT9.5

**Music-Evoked Emotion Classification using EEG Correlation-Based Information** .............................................. 3348-3351

Bo, Hongjian (Harbin Institute of Technology); Ma, Lin (Harbin Institute of Technology); Li, Haifeng* (Harbin Institute of Technology)

12:05-12:20 FrBT9.6

**Effects of the Temporal Pattern of Subthalamic Deep Brain Stimulation on the Neuronal Complexity in the Globus Pallidus** ......................................................... 3352-3355

Deng, Callie (Johns Hopkins University); Sun, Tony (Los Altos High School); Zhang, Manning (Johns Hopkins University); Gale, John (Cleveland Clinic); Montgomery, Erwin (University of Alabama at Birmingham); Santaniello, Sabato* (University of Connecticut)

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**FrBT10: 10:50-12:20**

**General and Theoretical Informatics – Deep learning and Big Data to Knowledge (Oral Session)**

**Chair:** Nguyen, Hung T. (University of Technology, Sydney)

10:50-11:05 FrBT10.1

**A Separated Feature Learning based DBN Structure for Classification of SSMVEP Signals** ....................................... 3356-3359

Jia, Yaguang (Xi'an Jiaotong University); Xie, Jun* (Xi'an Jiaotong University); Xu, Guanhua (Xi'an Jiaotong University); Li, Min (School of Mechanical Engineering, Xi'an Jiaotong University); Zhang, Sicong (Xi'an Jiaotong University); Luo, Ailing (Xi'an Jiaotong University); Han, Xingliang (Xi'an Jiaotong University)

11:05-11:20 FrBT10.2

**The Obesity Paradox in ICU Patients** ......................................................... 3360-3364

Pan, Janice* (The University of Texas at Austin); Shaffer, Robert (The University of Texas at Austin); Sinno, Zeina (The University of Texas at Austin); Tyler, Marcus (The University of Texas at Austin); Ghosh, Joydeep (Univ. of Texas at Austin)

11:20-11:35 FrBT10.3

**Automated Embolic Signal Detection using Deep Convolutional Neural Network** .................................................... 3365-3368

Sombune, Praotsana (Thammasat Univ.); Phienphanich, Phongphan (Thammasat Univ.); Phuechpanpaisal, Sutanya (Thammasat Univ.); Muengtaweepongs, Sombat (Thammasat Univ.); Ruamthanthong, Anuchit (Radiology Dept. Phramongkutklaow Hospital Bangkok); Tantibundhit, Charturong* (Thammasat Univ.)
11:35-11:50 FrBT10.4  
**A CHF Detection Method based on Deep Learning with RR Intervals** .......................................................... 3369-3372  
Chen, Wenhui (University of Technology Sydney); Liu, Guan-Zheng (Shenzhen Institutes of Advanced Technology); Su, Steven Weidong (University of Technology, Sydney); Jiang, Qing (Sun Yat-sen University); Nguyen, Hung T.* (University of Technology, Sydney)

11:50-12:05 FrBT10.5  
**DeepDeath: Learning to Predict the Underlying Cause of Death with Big Data** ................................................ 3373-3376  
Hassanzadeh, Hamid* (Georgia Institute of Technology); Wang, May D. (Georgia Tech and Emory University); Sha, Ying (Georgia Institute of Technology)

12:05-12:20 FrBT10.6  
**Automated Vision-Based Analysis of Levodopa-Induced Dyskinesia with Deep Learning** ............................... 3377-3380  
Li, Michael Hong Gang (University of Toronto); Mestre, Tiago (Ottawa Hospital Research Institute); Fox, Susan (University of Toronto); Taati, Babak* (Toronto Rehabilitation Institute and University of Toronto)

FrBT11: 10:50-12:20  
Greatbatch Room  
**Cardiovascular Simulations (Oral Session)**  
Chair: Shim, Eun Bo (Kangwon National University)  
Co-Chair: Chbat, Nicolas W. (Center of Excellence in Critical Care Innovation)

10:50-11:05 FrBT11.1  
Pilot Study on Vascular Intervention Training based on Blood Flow Effected Guidewire Simulation  .......... 3381-3384  
Cai, Jiayin (School of Biomedical Engineering, Shanghai Jiao Tong Univ.); Xie, Hongzhi (Peking Union Medical College Hospital); Zhang, Shuyang (Peking Union Medical College Hospital); Gu, Lixu* (Shanghai Jiaotong Univ.)

11:05-11:20 FrBT11.2  
**Applying Computer Simulation to the Design of Flow-Diversion Treatment for Intracranial Aneurysms**  .... 3385-3388  
Zhang, Mingzi* (Tohoku University); Li, Yujie (Tohoku University); Verrelli, David I. (Macquarie University); Chong, Winston (Interventional Neuroradiology Unit, Dept. of Diagnostic Ima); Ohta, Makoto (University of Tohoku); Qian, Yi (Macquarie University)

11:20-11:35 FrBT11.3  
**A Sensitivity Study on Modelling a Flow-Diverting Stent as a Porous Medium using Computational Fluid Dynamics**  ................................................................. 3389-3392  
Li, Yujie* (Tohoku University); Zhang, Mingzi (Tohoku University); Verrelli, David I. (Macquarie University); Yang, William (Mineral Resources, CSIRO); Chong, Winston (Interventional Neuroradiology Unit, Dept. of Diagnostic Ima); Ohta, Makoto (University of Tohoku); Qian, Yi (Macquarie University)

11:35-11:50 FrBT11.4  
**An HMM-Based Recognition Framework for Endovascular Manipulations** .......................................................... 3393-3396  
Zhou, Xiaohu (Institute of Automation, Chinese Academy of Sciences); Bian, Gui-Bin (Institute of Automation, Chinese Academy of Sciences); Xie, Xiao-Liang (Chinese Academy of Sciences); Hou, Zeng-Guang* (Institute of Automation, Chinese Academy of Sciences)

11:50-12:05 FrBT11.5  
**Effect of Catheter Positions on Hemodynamics and Coil Formation after Coil Embolization**  ......................... 3397-3400  
Fujimura, Soichiro* (Tokyo University of Science); Takao, Hiroyuki (Jikei University School of Medicine); Suzuki, Takashi (Tokyo University of Science); Dahmani, Chiheb (Technical University of Munich); Mamori, Hiroya (Tokyo University of science); Fukushima, Naoya (Tokyo University of Science); Yamamoto, Makoto (Tokyo University of Science); Murayama, Yuichi (Jikei University School of Medicine)

12:05-12:20 FrBT11.6  
**Effects of Septum and Pericardium on Heart-Lung Interactions in a Cardiopulmonary Simulation Model** .... 3401-3404  
Karamolegkos, Nikolaos* (Columbia University); Albanese, Antonio (Philips Research North America); Chbat, Nicolas W. (Center of Excellence in Critical Care Innovation)
FrBT14: 10:50-12:20
Image Segmentation I (Oral Session)
Chair: Xia, Zeyang (Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences)

10:50-11:05 FrBT14.1
Volumetric Analysis of Respiratory Gated Whole Lung and Liver CT Data with Motion-Constrained Graph Cuts Segmentation
Cha, Jung Won* (University of Louisville); Farhangi, Mohammad Mehdi (University of Louisville); Dunlap, Neal (University of Louisville, Louisville); Amini, Amir (University of Louisville)

11:05-11:20 FrBT14.2
Development of a Radiobiological Evaluation Tool to Assess the Expected Clinical Impacts of Contouring Accuracy between Manual and Semi-Automated Segmentation Algorithms
Kim, Yusung (Dept. of Radiation Oncology, The University of Iowa); Patwardhan, Kaustubh (The University of Iowa); Beichel, Reinhard (The University of Iowa); Smith, Brian (University of Iowa); Mart, Christopher (Medical University of South Carolina); Plichta, Kristin (University of Iowa); Tangel, Chang (Case Western Reserve University); Sonka, Milan (University of Iowa); Graham, Michael (University of Iowa); Magnotta, Vincent Alfonso (University of Iowa); Casavant, Benjamin (University of Wisconsin-Madison); Xia, Junyi* (University of Iowa); Buatti, John (Dept. of Radiation Oncology, The University of Iowa)

11:20-11:35 FrBT14.3
Angled Tooth Segmentation from Computerized Tomography Images
Gan, Yangzhou (Shenzhen Institutes of Advanced Technology, Chinese Academy of S); Xia, Zeyang* (Shenzhen Institutes of Advanced Technology, Chinese Academy of S); Xiong, Jing (Shenzhen Institutes of Advanced Technology, Chinese Academy of S); Zhou, Xinwen (Shanghai Jiao Tong University); Li, Guanglin (Shenzhen Institutes of Advanced Technology); Zhao, Qunfei (Shanghai Jiao Tong University)

11:35-11:50 FrBT14.4
Automatic Measurement of Fetal Nuchal Translucency from Three-Dimensional Ultrasound Data
Nie, Siqing (Fudan University); Yu, Jinhua* (Fudan University); Chen, Ping (First Maternity and Infant Hospital); Wang, Yuanyuan (Fudan University); Guo, Yi (Fudan University); Zhang, Jianqiu (Fudan University)

11:50-12:05 FrBT14.5
Brain Segmentation in MR Images using a Texture-Based Classifier Associated with Mathematical Morphology
Chang, Herng-Hua* (National Taiwan University); Hsieh, Chih-Chung (National Taiwan University)

12:05-12:20 FrBT15.1
Development of a Gesture and Voice Controlled System for Burn Injury Prevention in Individuals with Disabilities
Swanepeol, Liam (Stellenbosch University); Van Den Heever, Dawie* (Stellenbosch University); Dellimore, Kiran (Philips Research)

11:05-11:20 FrBT15.2
A Novel Mainstream Capnometer System for Endoscopy Delivering Oxygen
Kabumoto, Kenichiro* (Nihon Kohden Corporation); Takatori, Fumihiko (Nihon Kohden Corporation); Inoue, Masayuki (Nihon Kohden Corporation)
11:20-11:35 FrBT15.3
A Novel Smartphone Camera-LED Communication for Clinical Signal Transmission in Mhealth-Rehabilitation System ................................................................. 3437-3440
Pradana Rachim, Vega (Pukyong National University); An, Jinyoung (Pukyong National University); Pham, Ngoc Quan (Pukyong National University); Chung, Wan-Young* (Pukyong National University)

11:35-11:50 FrBT15.4
Profiling a Multiplex Short Tandem Repeat Loci from Human Urine with use of Low Cost On-Site Technology for Verification of Sample Authenticity ......................................................... 3441-3444
Pires, Nuno M. M. (University College of Southeast Norway and Institute of Appl); Dong, Tao* (University College of Southeast Norway - HSN, TekMar); Bernsten, Lasse (Dept. of Business, History and Social Sciences, School of B); Lønningdal, Torill (Innovatoriet at Dept. of Research and Internationalisation)

11:50-12:05 FrBT15.5
Fall Detection using Smart Floor Sensor and Supervised Learning .............................................................. 3445-3448
Minvielle, Ludovic* (ENS Cachan University), Tarkett GDL SA (Company); Atiq, Mounir (ENS Cachan University), Tarkett GDL SA (Company); Serra, Renan (Tarkett GDL SA); Mougeot, Mathilde (Université Paris-Diderot); Vayatis, Nicolas (Centre de Mathématiques et Leurs Applications, ENS Cachan, CNRS)

12:05-12:20 FrBT15.6
Respiration and Heartbeat Monitoring using a Distributed Pulsed MIMO Radar .......................................... 3449-3452
Walterscheid, Ingo* (Fraunhofer FHR); Smith, Graeme E. (The Ohio State University)

FrBT17: 10:50-12:20 Einthoven Hall
Signal Processing – Electromyography (Oral Session)
Chair: Kerkman, Jennifer N. (Vrije Universiteit Amsterdam)
Co-Chair: Zhang, Yingchun (University of Houston)

10:50-11:05 FrBT17.1
Simulations of High-Density Surface Electromyograms in Dynamic Muscle Contractions ............................. 3453-3456
Glaser, Vojko* (University of Maribor, Faculty of Electrical Engineering and Comp); Farina, Dario (Bernstein Center for Computational Neuroscience, University Medico); Holobar, Ales (University of Maribor, Faculty of Electrical Engineering and Comp)

11:05-11:20 FrBT17.2
Performance Evaluation of Noise-Assisted Multivariate Empirical Mode Decomposition and Its Application to Multichannel EMG Signals ................................................................. 3457-3460
Zhang, Yi* (Univ. of Electronic Science and Technology of China); Su, Steven Weidong (Univ. of Technology, Sydney); Xu, Peng (Univ of Elect Science and Tech of China); Yao, Dezhong (Univ. of Electronic Science and Technology of China)

11:20-11:35 FrBT17.3
Measuring the Interactions between Different Locations in a Muscle to Monitor Localized Muscle Fatigue ... 3461-3464
Bingham, Adrian* (RMIT University Melbourne); Poosapadi Arjunan, Sridhar (RMIT University); Kant Kumar, Dinesh (RMIT University)

11:35-11:50 FrBT17.4
Analysis of One Repetition during Biceps Curl Exercise among Age-Matched Adult Volunteers using Endurance, Curl Speed and Surface Electromyography Signals ................................................................. 3465-3468
Marri, Kiran (Indian Institute of Technology Madras, Chennai); Maitra, Diptasree (IIT Madras); Ramakrishnan, Swaminathan* (IIT Madras, India)

11:50-12:05 FrBT17.5
Antagonist Thigh-Muscle Activity in 6-to-8-Year-Old Children Assessed by Surface EMG during Walking .... 3469-3472
Di Nardo, Francesco* (Polytechnic Univ. of Marche); Strazza, Annachiara (Univ. Politheca delle Marche); Mengarelli, Alessandro (Univ. Politheca delle Marche); Ercolani, Serena (Univ. Politheca delle Marche); Burattini, Laura (Univ. Politheca delle Marche); Fioretti, Sandro (Univ. Politheca delle Marche)
### FrBT18: 10:50-12:20

**Nonlinear Dynamic Analysis II – Cardiovascular Signals** (Oral Session)

**Chair:** Castiglioni, Paolo (*Fondazione Don Carlo Gnocchi ONLUS*)  
**Co-Chair:** Lee, Jong-Ha (*Keimyung University, School of Medicine*)

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<td>Castiglioni, Paolo* (<em>Fondazione Don Carlo Gnocchi ONLUS</em>); Lazzeroni, Davide (<em>Fondazione Don Carlo Gnocchi, Parma, Italy</em>); Brambilla, Valerio (<em>Fondazione Don Carlo Gnocchi, Parma, Italy</em>); Coruzzi, Paolo (Dept. of Clinical and Experimental Medicine); Faini, Andrea (Istituto Auxologico Italiano)</td>
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<td>Valente, Martina (<em>University of Trento</em>); Javorka, Michal (<em>Comenius University, Jessenius Faculty of Medicine</em>); Turianikova, Zuzana (Dept. of Physiology, Comenius University, Jessenius Faculty); Czippelova, Barbora (Dept. of Physiology, Comenius University, Jessenius Faculty); Krohova, Jana (Comenius University in Bratislava); Nollo, Giandomenico (<em>University of Trento</em>); Faes, Luca* (<em>University of Trento</em>)</td>
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<td>Udhayakumar, Radhagayathri* (<em>University of Melbourne</em>); Karmakar, Chandan (<em>Deakin University</em>); Palaniswami, Marimuthu (<em>The University of Melbourne</em>)</td>
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<td>Nonlinear Dynamic Analysis of the Cardiorespiratory System in Patients Undergoing the Weaning Process</td>
<td>Arizmendi, Carlos (<em>Universidad Autonoma de Bucaramanga</em>); Trapero, Jose Ignacio (<em>Universidad Autonoma de Bucaramanga</em>); Gonzalez Acevedo, Hernando (<em>Universidad Autonoma de Bucaramanga</em>); Forero, Carlos Adolfo (<em>Universidad Autonoma de Bucaramanga</em>); Giraldo, Beatriz* (<em>Universitat Politècnica de Catalunya</em>)</td>
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### FrCT1: 14:20-15:50

**Signal Pattern Classification – Cardiovascular Signals I** (Oral Session)

**Chair:** Wu, Shun Chi (*National Tsing Hua University*)  
**Co-Chair:** Kim, Kiwoong (*Korea Research Institute of Standards and Science*)

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<td>A Cancelable Biometric Scheme based on Multi-Lead ECGs</td>
<td>Chen, Peng-Tzu (<em>National Tsing Hua University</em>); Wu, Shun Chi* (<em>National Tsing Hua University</em>); Hsieh, Jui Hsuan (<em>National Tsing Hua University</em>)</td>
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<td>Adaptive Fourier Decomposition based R-Peak Detection for Noisy ECG Signals</td>
<td>Wang, Ze (<em>Faculty of Science and Technology, University of Macau</em>); Wong, Chi Man (<em>University of Macau</em>); Wan, Feng* (<em>University of Macau</em>)</td>
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A Robust Automatic Mechanism for Electrocardiogram Interpretation in Telehealthcare

Ho, Te-Wei* (National Taiwan University); Lai, Feipei (National Taiwan University)

Designing ECG-Based Physical Unclonable Function for Security of Wearable Devices

Yin, Shihui* (Arizona State University); Bae, ChiSung (Samsung Advanced Institute of Technology); Kim, Sang Joon (Samsung Electronics); Seo, Jae-sun (Arizona State University)

A Body Position Influence on ECG Derived Respiration

Przystup, Piotr (Gdansk University of Technology); Polinski, Artur (Gdansk University of Technology); Wtorek, Jerzy* (Gdansk University of Technology); Bujnowski, Adam (Gdansk University of Technology); Kocejko, Tomasz (Gdansk University of Technology)

Analysis of PAM Clustering Accuracy for Cardiac Signals Classification

kianimajd, Adell (University of Algarve); Ruano, M. Graça* (FCT, University of Algarve & CISUC-University of Coimbra); de Carvalho, Paulo (University of Coimbra); Henriques, Jorge (University of Coimbra); Rocha, Teresa (Inst Superior de Eng de Coimbra); Ruano, Antonio (University of Algarve)

White Matter Integrity Correlates with Choline Level in Dorsal Anterior Cingulate Cortex of Obsessive Compulsive Disorder Patients: A Combined DTI-MRS Study

Wang, Ruilin (Shanghai Jiao Tong University); Fan, Qing (Shanghai Mental Health Center, Shanghai Jiao Tong University Sch); Zhang, Zongfeng (Shanghai Mental Health Center, Shanghai Jiao Tong University Sch); Chen, Yongjun (Shanghai Mental Health Center, Shanghai Jiao Tong University Sch); Tong, Shanbao (Shanghai Jiao Tong University); Li, Yao* (Shanghai Jiao Tong University)

A 3D Model-Based Simulation of Demyelination to Understand Its Effects on Diffusion Tensor Imaging

Salan, Teddy* (University of Memphis); Jacobs, Eddie (University of Memphis); Reddick, Wilburn (St. Jude Children’s Research Hospital)

Multi-View Collaborative Segmentation for Prostate MRI Images

Wang, Xiuying (The University of Sydney); Tang, Wensi (University of Sydney); Cui, Hui* (The University of Sydney); Zeng, Shan (Wuhan Polytechnic University); Feng, Dagan (The University of Sydney); Fulham, Michael (Royal Prince Alfred Hospital)

A Portable, Low-Cost, 3D-Printed Main Magnetic Field System for Magnetic Imaging

Kang, Iksung* (Seoul National University)

Accelerated Magnetic Resonance Spectroscopy with Vandermonde Factorization

Qu, Xiaobo* (Xiamen University); Ying, Jiaxi (Dept. of Electronic Science, Xiamen University); Cai, Jian-Feng (Dept. of Mathematics, Hong Kong University of Science and Technology); Chen, Zhong (Xiamen University)

A Novel 3D-Printed Mechanical Actuator using Centrifugal Force for Magnetic Resonance Elastography

Neumann, Wiebke* (Heidelberg University); Schad, Lothar R. (Heidelberg University); Zöllner, Frank G. (Heidelberg University)
### FrCT5: 14:20-15:50  
**Lee Room**

**Wearable Sensors and Systems II (Oral Session)**  
**Chair:** Kang, Hongki *(KAIST)*

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<td>Nair, Chaitanya Muralidharan <em>(National University of Singapore)</em></td>
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<td>Marjanovic, Nicholas <em>(University of Illinois at Chicago)</em>; Piccinini, Giacomo <em>(University of Illinois at Chicago)</em>; Kerr, Kevin <em>(University of Illinois-Chicago)</em>; Esmailbeigi, Hananeh <em>(University of Illinois at Chicago (UIC))</em></td>
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<td><strong>One Size Fits All Electronics for Insole-Based Activity Monitoring</strong></td>
<td>Hegde, Nagaraj <em>(The University of Alabama)</em>; Bries, Matthew <em>(The University of Alabama)</em>; Melanson, Ed <em>(University of Colorado at Denver)</em>; Sazonov, Edward <em>(University of Alabama)</em></td>
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### FrCT6: 14:20-15:50  
**Zworykin Room**

**Cell and Protein Interaction with External Fields I (Oral Session)**

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<td>Houlihan, Ruth <em>(Tyndall National Institute, University College Cork)</em>; Grygoryev, Konstantin <em>(Tyndall National Institute, University College Cork)</em>; Ning, Zhenfei <em>(School of Biochemistry and Cell Biology, University College Cork)</em>; Williams, John Michael <em>(School of Biochemistry and Cell Biology, University College Cork)</em>; Moore, Tom <em>(School of Biochemistry and Cell Biology, University College Cork)</em>; O'Mahony, Conor <em>(Tyndall National Institute, University College Cork)</em></td>
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<td><strong>EM Fields Comparison between Planar vs. Solenoidal uMS Coil Designs for Nerve Stimulation</strong></td>
<td>Bonmassar, Giorgio <em>(A. A. Martinos Ctr. for Biomedical Imaging)</em>; Golestanirad, Laleh <em>(University of Toronto)</em></td>
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Determination of Red Blood Cell Fatigue using Electrodeformation .................................................. 3584-3587
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14:20-14:50 Schwan Room
EEG and Electrical Source Imaging (Oral Session)

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Li, Chuang (University of Oklahoma); Yuan, Han (University of Oklahoma); Urbano, Diamond (Laureate Institute for Brain Research); Cha, Yoon-Hee (Laureate Institute of Brain Research); Ding, Lei* (University of Oklahoma)

Spatial Regularization based on dMRI to Solve EEG/MEG Inverse Problem ........................................... 3608-3611
Belaoucha, Brahim* (Université Côte d’Azur, Inria); Papadopoulo, Théodore (INRIA Sophia-Antipolis)

EEG Fluctuations of Wake and Sleep in Mild Cognitive Impairment .................................................... 3612-3615
O'Keefe, Johnny (The Univ. of Oklahoma); Carlson, Barbara (The Univ. of Oklahoma); DeStefano, Lisa (The Univ. of Oklahoma); Wenger, Michael (Univ. of Oklahoma); Craft, Melissa (The Univ. of Oklahoma); Hershey, Linda (The Univ. of Oklahoma); Hughes, Jeremy (The Univ. of Oklahoma); Wu, Dee (Univ of Oklahoma Health Sciences); Ding, Lei (Univ. of Oklahoma); Yuan, Han* (Univ. of Oklahoma)
FrCT8.6
Computon of Surface Laplacian for Tri-Polar Ring Electrodes on High-Density Realistic Geometry Head Model
Ma, Junwei* (University of Oklahoma); Yuan, Han (University of Oklahoma); Sunderam, Sridhar (University of Kentucky); Besio, W. G. (University of Rhode Island); Ding, Lei (University of Oklahoma)

FrCT9: 14:20-15:50
Neural Signal Processing II (Oral Session)
Chair: Wheeler, Bruce (University of Florida)

14:20-14:35
Independent Component Analysis-Based Spatial Filtering Improves Template-Based SSVEP Detection
Nakanishi, Masaki* (University of California San Diego); Wang, Yijun (Institute of Semiconductors, Chinese Academy of Sciences); Hsu, Sheng-Hsiou (University of California, San Diego); Wang, Yu-Te (University of California San Diego); Jung, Tzuy-Ping (University of California San Diego)

14:35-14:50
Using Monkey Hand Exoskeleton to Explore Finger Passive Joint Movement Response in Primary Motor Cortex
Qian, Kai* (Illinois Institute of Technology); Antonio dos Anjos Jr., Luiz (Illinois Institute of Chicago); Balasubramanian, Karthikeyan (University of Chicago); Stilson, Kelsey (The University of Chicago); Balcer, Carrie Anne (University of Chicago); Hatsopoulos, Nicholas (University of Chicago); Kamper, Derek (Rehabilitation Institute of Chicago)

14:50-15:05
Specific CA3 Neurons Decode Neural Information of Dentate Granule Cells Evoked by Paired-Pulse Stimulation in Co-Cultured Networks
Poli, Daniele (University of California, Irvine); DeMarse, Thomas B. (University of Florida); Wheeler, Bruce* (University of Florida); Brewer, Gregory (University of California Irvine, Southern Illinois University)

15:05-15:20
Information Transmission in the Primary Visual Cortex of Retinal Degenerated Rats
Wang, Yi* (City University of Hong Kong); Chen, Ke (University of Electronic Science and Technology of China); Chan, Leanne LH (City University of Hong Kong)

15:20-15:35
Sparse Coding of ECoG Signals Identifies Interpretable Components for Speech Control in Human Sensorimotor Cortex
Bouchard, Kristofer E.* (LBNL); Bujan, Alejandro F (UC Berkeley); Chang, Edward (UCSF); Sommer, Friedrich (University of California Berkeley)

15:35-15:50
A New EMG-Based Index towards the Assessment of Elbow Spasticity for Post-Stroke Patients
Wang, Lei (Shenzhen Institutes of Advanced Technology Chinese Academy of S); Guo, Xin (Hebei University of Technology); Fang, Peng (Shenzhen Institutes of Advanced Technology, Chinese Academy of S); Wei, Yue (Shenzhen Institutes of Advanced Technology, Chinese Academy of S); Samuel, Oluwarotimi Williams (Shenzhen Institutes of Advanced Technology); Huang, Pin-Gao (Chinese Academy of Sciences); Geng, Yanjuan (Shenzhen Institutes of Advanced Technology); Wang, Hui* (Shenzhen Institutes of Advanced Technology, Chinese Academy of S); Li, Guanglin (Shenzhen Institutes of Advanced Technology)

FrCT10: 14:20-15:50
General and Theoretical Informatics – Data Mining I (Oral Session)
Chair: Fotiadis, Dimitrios I. (University of Ioannina)

14:20-14:35
Gamaid: Greedy CP Tensor Decomposition for Supervised EHR-Based Disease Trajectory Differentiation
Henderson, Jette (Univ. of Texas at Austin); Ho, Joyce C.* (Emory Univ.); Ghosh, J. (Univ of Texas, Austin)
A Computational Approach for the Estimation of Heart Failure Patients Status using Saliva Biomarkers  
Tripoliti, Evanthia (University of Ioannina); Papadopoulos, Theofilos (Unit of Medical Technology and Intelligent Information Systems); Karanasiou, Georgia (Institute of Molecular Biology and Biotechnology, FORTH, Ioannin); Kalatzis, Fanis (Dept. of Biomedical Research, Institute of Molecular Biology); Goletsis, Yorgos (University of Ioannina); Bechioulis, Aris (Michaelion Cardiac Center, University of Ioannina, and 2nd Dept); Ghimienti, Silvia (University of Pisa, Dept. of Chemistry and Industrial Chemi); Lomonaco, Tommaso (University of Pisa, Dept. of Chemistry and Industrial Chemi); Bellagambi, Francesca (University of Pisa, Dept. of Chemistry and Industrial Chemi); Trivella, Maria G. (Istituto di Fisiologia Clinica-CNR, Pisa); Fuoco, Roger (University of Pisa, Dept. of Chemistry and Industrial Chemi); Marzilli, Mario (Azienda Ospedaliera-Universitaria Pisana, Cardiothoracic and Vas); Scali, Maria Chiara (Azienda Ospedaliera-Universitaria Pisana, Cardiothoracic and Vas); Naka, Katerina (University of Ioannina); Abdelhamid, Errachid (Université de Lyon, Institut de Sciences Analytiques (ISA)); Fotiadis, Dimitrios I.* (University of Ioannina)

Exploration of Unsupervised Feature Selection Methods to Predict Chronological Age of Individuals by Utilising CpG Dinucleotics from Whole Blood  
Sarac, Ferdi (Northumbria University at Newcastle); Seker, Huseyin* (The University of Northumbria at Newcastle); Bouridane, Ahmed (Northumbria University)

Wrapper Method for Feature Selection to Classify Cardiac Arrhythmia  
Mustaqeem, Anam (University of Engineering and Technology, Taxila); Anwar, Syed* (University of Engineering and Technology); Majid, Muhammad (University of Engineering and Technology, Taxila); Khan, Abdul Rashid (POF Hospital, Wah Cantt.)

Prediction and Imputation in Irregularly Sampled Clinical Time Series Data using Hierarchical Linear Dynamical Models  
Sengupta, Abhishek (Walmart Labs India); Ap, Prathosh (Xerox Research Centre India); Shukla, Satya Narayan (University of Massachusetts Amherst); Rajan, Vaibhav (Yen4Ken Software Pvt. Ltd.); Reddy, Chandan K (Virginia Tech); Shukla, Satya Narayan* (University of Massachusetts Amherst)

Identifying Frauds and Anomalies in Medicare-B Dataset  
Seo, Jiwon* (UNIST); Mendelevitch, Ofer (LendUp.com)

Models of Cardiac Function and Blood Flow (Oral Session)

A Computational Model of Myocardial Microcirculation including Interstitial Flow  
Shimayoshi, Takao* (Kyushu Univ.); Yamamoto, Yuta (Kyoto Univ.); Matsuda, Tetsuya (Kyoto Univ.)

PWPSim: A New Simulation Tool of Pulse Wave Propagation in the Human Arterial Tree  
Xiao, Hanguang (Chongqing University of Technology); Butlin, Mark (Macquarie University); Tan, Isabella (Macquarie University); Avolio, Alberto P* (Macquarie University)

Global Sensitivity Analysis for Developing Biological Models: Application to K+ Channel Model in Mouse Ventricular Myocytes  
Du, Dongping* (Texas Tech University); Du, Yuncheng (Clarkson University)

A Generic Cardiac Biventricular Fluid-Electromechanics Model  
Ahmad Bakir, Azam (The University of New South Wales); Al Abed, Amr (University of New South Wales); Lovell, Nigel H. (University of New South Wales); Dokos, Socrates* (University of New South Wales)
Effects of Island-Distribution of Mid-Cardiomyocytes on Ventricular Electrical Excitation Associated with the KCNQ1-Linked Short QT Syndrome

Luo, Cunjin* (Harbin Institute of Technology, School of Computer Science and T); Wang, Kuanquan (Harbin Institute of Technology); Zhang, Henggui (Harbin Institute of Technology, School of Computer Science and T); Zhang, Yue (Harbin Engineering University)

Hyperthermia Dependence of Cardiac Conduction Velocity in Rat Myocardium: Optical Mapping and Cardiac Near Field Measurements

Pollnow, Stefan* (Karlsruhe Institute of Technology); Arnold, Robert (Medical University of Graz, Austria); Werber, Matthias (Karlsruhe Institute of Technology (KIT)); Doessel, Olaf (Karlsruhe Institute of Technology (KIT)); Seemann, Gunnar (University Heart Center Freiburg - Bad Krozingen)

An Enhanced Hybrid Tracking-Mosaicking Approach for Surgical View Expansion

Takada, Chisato* (Chiba University); Afifi, Ahmed (Chiba University); Suzuki, Toshiyuki (Chiba University); Nakaguchi, Toshiya (Chiba University)

A Low-Dimensional Representation for Individual Head Geometries

Miklody, Daniel* (Technische Universität Berlin); Bagdasarian, Milena Teresa (Technische Universität Berlin, Fraunhofer HHI); Blankertz, Benjamin (Technische Universität Berlin)

GPU-Based Volume Reconstruction for Freehand 3D Ultrasound Imaging

Wen, Tiexiang* (Shenzhen Institutes of Advanced Technology, Chinese Academy); Liu, Lei (Shenzhen Institutes of Advanced Technology, Chinese Academy); Qin, Wenjian (Shenzhen Institutes of Advanced Technology, Chinese Academy); Gu, Jia (Shenzhen Inst of Advanced Technology)

BrainWatch Software for Interactive Exploration of Brain Scans in 3D Virtual Reality Systems

Taswell, S. Koby (Brain Health Alliance); Veeramacheni, Teja (Brain Health Alliance); Taswell, Carl* (Brain Health Alliance)

Image Recognition of Triangular Tissue of an Organ Pulled by Forceps in Surgical Working Area for Laparoscope Robot

Nakasuji, Hisa* (Osaka Institute of Technology); Naruki, Kazuki (Osaka Institute of Technology); Kawai, Toshikazu (Osaka Institute of Technology); Nishikawa, Atsushi (Shinshu University); Nishizawa, Yuji (Dept. of Gastroenterological Surgery, Faculty of Medicine); Nakamura, Tatsuo (Kyoto University)

Cardiac Safety Profile for Random Complex Waveforms

Pratt, Hugh (CPLSO); Andrews, Chris (University of Queensland); Panescu, Dorin* (Advanced Cardiac Therapeutics); Lake, Blossom (Shrewsbury and Telford Hospital)

Development of Respiratory Function Monitor for Neonates

Takatori, Fumihiko* (Nihon Kohden Corporation); Inoue, Shinichiro (Nihon Kohden Corporation); Togo, Satoru (Nihon Kohden Corporation); Yamamori, Shinji (Nihon Kohden Corporation)
### 14:50-15:05

**Transmission Delay Performance in Telemedicine: A Case Study**

- Wang, Gang* (Univ. of Connecticut)
- Lin, Shan (Stony brook Univ.)
- Mullen-Fortino, Margaret (Univ. of Pennsylvania)
- Sokolsky, Oleg (Univ. of Pennsylvania)
- Lee, Insup (Univ. of Pennsylvania)

### 15:05-15:20

**A Novel Platform for Distributed and Remote Real-Time Monitoring of Animal Model Behavior in a Biodieter**

- Manso, André (Instituto Superior Técnico, Universidade de Lisboa)
- Martinho, Miguel (Instituto Superior Técnico, Universidade de Lisboa)
- Plácido da Silva, Hugo* (IST - Instituto Superior Técnico)
- Silvério Cabrita, António (Coimbra Chemistry Center, University of Coimbra)
- Bangango, António Francisco (Instituto Politécnico de Coimbra, ISEC)
- Machado, Gonçalo (ISEC)
- Macedo, Milton (IPC - ISEC and LIBPhys)

### 15:20-15:35

**Iquant™ Analyser: A Rapid Quantitative Immunoassay Reader**

- Joseph, Jayaraj* (HTIC, Indian Institute of Tech. Madras)
- Vasan, Jayaraman Kiruthi (Healthcare Tech. Innovation Center)
- Shah, Malay Illesh (Healthcare Tech. Innovation Center (HTIC), Indian Institute)
- Sivaprakasam, Mohanasankar (Indian Institute of Tech. Madras)
- Mahajan, Lalit (J Mitra & Co Pvt. Ltd.)

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### 14:20-15:50

**Signal Processing – Sleep Analysis (Oral Session)**

**14:20-14:35
Snore Sound Recognition: On Wavelets and Classifiers from Deep Nets to Kernels**

- Qian, Kun (Technical University of Munich)
- Janott, Christoph (Technical University of Munich)
- Jun, Deng (University of Passau)
- Heiser, Clemens (Technical University of Munich)
- Hohenhorst, Winfried (Alfried Krupp Krankenhaus)
- Herzog, Michael (Carl-Thiem-Klinikum Cottbus)
- Cummins, Nicholas* (University of Passau)
- Schuller, Bjoern (University of Passau)

**14:35-14:50
A Bayesian Neural Network Approach to Compare the Spectral Information from Nasal Pressure and Thermistor Airflow in the Automatic Sleep Apnea Severity Estimation**

- Gutierrez, Gonzalo Cesar* (University of Valladolid)
- de Frutos, Julio (Hospital Universitario Rio Hortega de Valladolid)
- Álvarez, Daniel (University of Valladolid)
- Vaquerizo-Villar, Fernando (Biomedical Engineering Group, University of Valladolid)
- Barroso-García, Verónica (Biomedical Engineering Group, E.T.S.I. de Telecomunicación, Univ)
- Crespo, Andrea (Hospital Universitario Rio Hortega, Valladolid)
- del Campo, Félix (Hospital del Rio Hortega. Universidad de Valladolid)
- Hornero, Roberto (University of Valladolid)

**14:50-15:05
Estimation of a Priori Probabilities of Sleep Stages: A Cycle-Based Approach**

- Tataradize, Alexander* (Bauman Moscow State Technical University)
- Anishchenko, Lesya (BMSTU)
- Korostovtseva, Lyudmila (Federal North-West Medical Research Centre)
- Bochkarev, Mikhail (Federal North-West Medical Research Centre)
- Sviyayev, Yuri (Sleep Laboratory, Federal Almazov Medical Research Centre)
- Ivashov, Sergey (Bauman Moscow State Technical University)

**15:05-15:20
Comparing Two Insomnia Detection Models of Clinical Diagnostic Techniques**

- Mulaffer, Lamana* (Texas A&M University at Qatar)
- Shahin, Mostafa (Texas A&M University at Qatar)
- Glos, Martin (Charite-Universitaetsmedizin Berlin)
- Penzel, Thomas (Charite Universitätsmedizin Berlin)
- Ahmed, Beena (Texas A&M University at Qatar)

**15:20-15:35
Usefulness of Discrete Wavelet Transform in the Analysis of Oximetry Signals to Assist in Childhood Sleep Apnea-Hypopnea Syndrome Diagnosis**

- Vaquerizo-Villar, Fernando (Biomedical Engineering Group, University of Valladolid)
- Álvarez, Daniel (University of Valladolid)
- Gutierrez, Gonzalo Cesar (University of Valladolid)
- Barroso-García, Verónica (Biomedical Engineering Group, E.T.S.I. de Telecomunicación, Univ)
- Kheirandish-Gozal, Leila (Section of Sleep Medicine, Dept. of Pediatrics, Pritzker Sc)
- Crespo, Andrea (Hospital Universitario Rio Hortega, Valladolid)
- del Campo, Félix (Hospital del Rio Hortega. Universidad de Valladolid)
- Gozal, David (Section of Sleep Medicine, Dept. of Pediatrics, Pritzker Sc)
- Hornero, Roberto* (University of Valladolid)
Detecting Obstructive Sleep Apnea in Children by Self-Affine Visualization of Oximetry

Garde, Ainara* (University of Twente); Kheirkhah Dehkordi, Parastoo (University of British Columbia);
Petersen, Christian (British Columbia Children’s Hospital); Ansermino, J. Mark (British Columbia’s Children’s Hospital); Dumont, Guy (University of British Columbia)

Biomedical Data Beyond Linear Correlation: Higher Order Statistics and Non-Gaussianity, Non-Linearity and Multifractality (Invited Session)
Chair: Yamamoto, Yoshiharu (The University of Tokyo)
Co-Chair: Abry, Patrice (ENS Lyon, CNRS)

Multiscale Properties of Instantaneous Parasympathetic Activity in Severe Congestive Heart Failure: A Survivor vs Non-Survivor Study
Valenza, Gaetano* (Univ. of Pisa); Wendt, Herwig (CNRS, Univ. of Toulouse); Kiyono, Ken (Osaka Univ.);
Hayano, Junichiro (Nagoya City Univ.); Watanabe, Eiichi (Fujita Health Univ.); Yamamoto, Yoshiharu (The Univ. of Tokyo); Abry, Patrice (ENS Lyon, CNRS); Barbieri, Riccardo (Politecnico di Milano)

Validation of Instantaneous Bispectral High-Frequency Power of Heartbeat Dynamics as a Marker of Cardiac Vagal Activity
Valenza, Gaetano (University of Pisa); Greco, Alberto (University of Pisa); Scilingo, Enzo Pasquale (University of Pisa); Barbieri, Riccardo* (Politecnico di Milano)

Spatially Regularized Multifractal Analysis for fMRI Data
Ciuciu, Philippe (CEA); Wendt, Herwig* (CNRS, University of Toulouse); Combrexelle, Sébastien (IRIT, University of Toulouse); Abry, Patrice (ENS Lyon, CNRS)

Health Technology Management and Assessment (Poster Session)

Development and Assessment of a Novel Ankle Rehabilitation System for Stroke Survivors
Lee, Beom-Chan* (Univ. of Houston); Daeh-Ke, Kim (Korea Institute of Robot and Convergence); Son, Younsun (Univ. of Houston); Kap-Ho, Seo (Korea Institute of Robot and Convergence); Sung Ho, Park (Korea Institute of Robot and Convergence); Yoo, Dongyual (Univ. of Houston); Alberto, Fung (Univ. of Houston)

A New Fall-Inducing Technology Platform: Development and Assessment of a Programmable Split-Belt Treadmill
Lee, Beom-Chan* (University of Houston); Martin, Bernard (University of Michigan); Thrasher, Timothy Adam (University of Houston); Layne, Charles (University of Houston)

Empowering Individual Healthcare Decisions through Technology I (Poster Session)

Smart Mobility Solution with Multiple Input Output Interface
Sethi, Aartika* (IIIT Delhi); Deb, Sujay (Indraprastha Institute of Information Technology, Delhi);
Ranjan, Prabhat (TIFAC); Sardar, Arghya (TIFAC)

Simple and Low-Cost Polymer Lens Fabrication using a Pressure-Driven Micro Chamber
Seo, Min-Won (Seoul National University); Koo, Kyoin (University of Ulsan); Seo, Jong Mo* (Seoul National University, School of Engineering)
### Proposal of Custom Made Wrist Orthoses based on 3D Modelling and 3D Printing

**Abreu de Souza, Mauren* (Federal University of Technology – Paraná (UTFPR)); Schmitz, Cristiane (Federal University of Technology – Paraná (UTFPR)); Marega Pinhel, Marcelo (UTFPR); Palma Setti, João (UTFPR); Nohama, Percy (Universidade Tecnologica Federal do Parana)**

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### Saturday, 15 July 2017

**SaAT1: 08:00-09:30**

**Roentgen Hall**

#### Data Mining and Processing in Biosignals I (Oral Session)

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<th>Authors</th>
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<td>08:00-08:15</td>
<td>SaAT1.1</td>
<td>A Flexible Method for the Automated Offline-Detection of Artifacts in Multi-Channel Electroencephalogram Recordings</td>
<td>Waser, Markus* (Technical Univ. of Denmark); Garn, Heinrich (AIT Austrian Institute of Technology GmbH); Benke, Thomas (Innsbruck Medical Univ.); Dal-Bianco, Peter (Medical Univ. of Vienna); Ransmayr, Gerhard (AKh Allgemeines Krankenhaus der Stadt Linz GmbH); Schmidt, Reinhold (Graz Medical Univ.); Jennum, Poul (Univ. of Copenhagen, Denmark); Sorensen, Helge B D (Technical Univ. of Denmark)</td>
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<td>08:15-08:30</td>
<td>SaAT1.2</td>
<td>Elucidating Age-Specific Patterns from Background Electroencephalogram Pediatric Data Sets via PARAFAC</td>
<td>Kinney-Lang, Eli* (Univ. of Edinburgh); Spyrou, Loukianos (Univ. of Edinburgh); Ebied, Ahmed (Univ. of Edinburgh); Chin, Richard (The Univ. of Edinburgh); Escudero, Javier (Univ. of Edinburgh)</td>
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<td>08:30-08:45</td>
<td>SaAT1.3</td>
<td>Speech Features for Telemonitoring of Parkinson’s Disease Symptoms</td>
<td>Ramezani, Hamideh* (Koc University); Khaki, Hossein (Koc University); Erzin, Engin (Koc University); Akan, Ozgur B. (Koc University)</td>
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<td>08:45-09:00</td>
<td>SaAT1.4</td>
<td>”You Sound Ill, Take the Day Off“: Automatic Recognition of Speech Affected by Upper Respiratory Tract Infection</td>
<td>Cummins, Nicholas* (University of Passau); Schmitt, Maximilian (University of Passau); Amriparian, Shahin (University of Passau); Krajewski, Jarek (University of Wuppertal); Schuller, Bjoern (University of Passau)</td>
</tr>
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<td>09:00-09:15</td>
<td>SaAT1.5</td>
<td>Linear-Sigmoidal Modelling of Accelerometer Features and Tinetti Score for Automatic Fall Risk Assessment</td>
<td>Rivolta, Massimo Walter* (Università degli studi di Milano); Sassi, Roberto (Università degli Studi di Milano)</td>
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<tr>
<td>09:15-09:30</td>
<td>SaAT1.6</td>
<td>Convolutional Neural Network Architecture and Input Volume Matrix Design for ERP Classifications in a Tactile P300 – Based Brain – Computer Interface</td>
<td>Kodama, Takumi* (University of Tsukuba); Makino, Shoji (University of Tsukuba)</td>
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</table>

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**SaAT3: 08:00-09:30**

**Park Room**

#### Infrared and Thermal Imaging (Oral Session)

**Chair:** Czaplik, Michael (University Hospital RWTH Aachen)

**Co-Chair:** Ruminski, Jacek (Gdansk University of Technology)

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<td>08:00-08:15</td>
<td>SaAT3.1</td>
<td>Estimation of Respiratory Rate from Thermal Videos of Preterm Infants</td>
<td>Barbosa Pereira, Carina* (RWTH Aachen University); Heimann, Konrad (University Children’s Hospital, Dept. of Neonatology, RWTH); Venema, Boudewijn (Philips Chair for Medical Information Technology, RWTH Aachen Un); Blazek, Vladimir (Philips Chair for Medical Information Technology, RWTH Aachen Un); Czaplik, Michael (University Hospital RWTH Aachen); Leonhardt, Steffen (RWTH Aachen University)</td>
</tr>
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</table>
08:15-08:30 SaAT3.2
**Automated Segmentation of Regions of Interest from Thermal Images of Hands** ....................................... 3822-3826
Gauci, Jean (University of Malta); Falzon, Owen* (University of Malta); Camilleri, Kenneth Patrick (University of Malta); Formosa, Cynthia (University of Malta); Gatt, Alfred (University of Malta); Mizzi, Stephen (University of Malta); Mizzi, Anabelle (University of Malta); Cassar, Kevin (Mater Dei Hospital); Sturgeon, Cassandra (University of Malta); Chockalingam, Nachiappan (Staffordshire University)

08:30-08:45 SaAT3.3
**Automatic Analysis of the Aggressive Behavior of Laboratory Animals using Thermal Video Processing** ... 3827-3830
Mazur-Milecka, Magdalena (Gdańsk Univ. of Technology); Ruminski, Jacek* (Gdansk Univ. of Technology)

08:45-09:00 SaAT3.4
**Development of a "Thermal-Associated Pain Index" Score using Infrared-Thermography for Objective Pain Assessment** ................................................................................. 3831-3834
Czaplik, Michael* (University Hospital RWTH Aachen); Hochhausen, Nadine (RWTH Aachen University, Section Medical Technology at The Depart); Dohmeier, Henriette (RWTH Aachen University, Section Medical Technology at The Depart); Barbosa Pereira, Carina (RWTH Aachen University); Rossaint, Rolf (RWTH Aachen University, Dept. of Anesthesiology)

09:00-09:15 SaAT3.5
**Comparison of Motion-Based Analysis to Thermal-Based Analysis of Thermal Video in the Extraction of Respiration Patterns** ............................................................ 3835-3839
Bennett, Stephanie Louise* (Carleton University); Goubran, Rafik A. (Carleton University); Knoefel, Frank-Dietrich (Bruyere Continuing Care, University of Ottawa, Carleton Universi)

SaAT5: 08:00-09:30 Lee Room
**Integrated Circuits and Systems** (Oral Session)
**Chair:** Pino, Esteban J (Universidad de Concepcion)

08:00-08:15 SaAT5.1
**A Sub-nmj CMOS ECG Classifier for Wireless Smart Sensor** ................................................................. 3840-3843
Chollet, Paul* (IMT Atlantique Bretagne-Pays de la Loire); Pallas, Rémi (Telecom breTAGNe); Lahuc, Cyril (TELECOM Bretagne, FRance); Arzel, Matthieu (TELECOM Bretagne, France); Seguin, Fabrice (Institut Mines Telecom Atlantique)

08:15-08:30 SaAT5.2
**A Low Power, Low Noise Programmable Analog Front End (PAFE) for Biopotential Measurements** ...... 3844-3847
Adimulam, Mahesh Kumar* (Birla Institute of Tech. and Science – Pilani, Hyderabad Ca); Adimulam, Divya (EE Dept., Birla Institute of Tech. and Science – Pilani); K, Tejaswi (Birla Institute of Tech. and Science – Pilani, Hyderabad Ca); M B, Srinivas (EE Dept., Birla Institute of Tech. and Science – Pilani)

08:30-08:45 SaAT5.3
**Improving Efficiency of DC/DC Booster Converters used in Electrical Stimulators** ............................... 3848-3851
Aqueveque, Pablo* (University of Concepcion); Saavedra, Francisco (University of Concepcion); Pino, Esteban J (Universidad de Concepcion)

08:45-09:00 SaAT5.4
**Wireless Wearable User Interface Cursor-Controller (UIC-C)** ................................................................. 3852-3855
Marjanovic, Nicholas* (University of Illinois at Chicago); Kerr, Kevin (University of Illinois-Chicago); Aranda, Ricardo (University of Illinois at Chicago); Hickey, Richard (University of Illinois at Chicago); Esmailbeigi, Hananeh (University of Illinois at Chicago (UIC))

SaAT7: 08:00-09:30 Herrick Room
**Neurorehabilitation I** (Oral Session)

08:00-08:15 SaAT7.1
**Feasibility of using the RAPAEL Smart Glove in Upper Limb Physical Therapy for Patients after Stroke: A Randomized Controlled Trial** ..................................................... 3856-3859
Jung, Hee-Tae* (Daegu University); Kim, Hwan (Daegu University); Jeong Jugyeong, Jeong Jugyeong (Heeyeon Hospital); Jeon, Bomin (Occupational Therapy); Ryu, Taekyeong (Heeyeon Hospital); Kim, Yangsoo (Heeyeon Hospital)
Assessment of Elbow Spasticity with Surface Electromyography and Mechanomyography based on Support Vector Machine

Wang, Hui (Shenzhen Institutes of Advanced Technology, Chinese Academy of S); Wang, Lei (Shenzhen Institutes of Advanced Technology Chinese Academy of Sc); Xiang, Yun (The Sixth People's Hospital of Shenzhen City, Rehabilitation Ins); Zhao, Ning (Rehabilitation Unit, Nanshan District People's Hos); Li, Xiangxin (Shenzhen Institutes of Advanced Technology, Chinese Academy of Sc); Chen, Shixiong (Shenzhen Institutes of Advanced Technology); Lin, Chuang (University Medical Center Goettingen, Georg-August University); Li, Guanglin* (Shenzhen Institutes of Advanced Technology)

Accurate Estimation of Joint Motion Trajectories for Rehabilitation using Kinect

Sinha, Sanjana* (Innovation Labs, Tata Consultancy Services Ltd.); Bhowmick, Brojeshwar (Innovation Labs, Tata Consultancy Services Ltd.); Sinha, Aniruddha (Tata Consultancy Services Ltd.); Das, Abhijit (Institute of NeuroSciences Kolkata)

Electrical Neurostimulation of a Mammalian Nerve Fibers: A Probabilistic versus Mechanistic Approach

Sadashivaiah, Vijay* (Johns Hopkins University); Sacré, Pierre (Johns Hopkins University); Guan, Yun (Johns Hopkins University School of Medicine); Anderson, William S. (Johns Hopkins School of Medicine, Dept. of Neurosurgery); Sarma, Sridevi V. (Johns Hopkins University)

Quantification Method of Motor Function Recovery of Fingers by using the Device for Home Rehabilitation

Furudate, Yuta* (Future University Hakodate); Yamamoto, Kazuki (Future University Hakodate); Ishida, Yuji (Hokkaido Bunkyo University); Chiba, Kaori (Medical Association Hospital Hakodate); Mikami, Sadayoshi (Future University Hakodate)

Identification of Differentially Expressed Genes through a Meta-Analysis Approach for Oral Cancer Classification

Kourou, Konstantina (Unit of Biological Applications and Technology, University of Io); Papaloukas, Costas (University of Ioannina); Fotiadis, Dimitrios I.* (University of Ioannina)

Alignment-Free Sequence Comparison using Joint Frequency and Position Information of K-Words

Han, Gyu-Bum (Korea Advanced Institute of Science and Technology (KAIST)); Chung, Byung Chang (Korea Advanced Institute of Science and Technology (KAIST)); Cho, Dong-Ho* (Korea Advanced Institute of Science and Technology (KAIST))

Privacy-Preserving Chi-Squared Testing for Genome SNP Databases

Sei, Yuichi* (University of Electro-Communications); Ohsuga, Akihiko (University of Electro-Communications)

MotifMark: Finding Regulatory Motifs in DNA Sequences

Hassanzadeh, Hamid* (Georgia Institute of Technology); Wang, May D. (Georgia Tech and Emory University)

Classification of Various Genomic Sequences based on Distribution of Repeated K-Word

Song, Yong-Joon (Korea Advanced Institute of Science and Technology (KAIST)); Cho, Dong-Ho* (Korea Advanced Institute of Science and Technology (KAIST))
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<td>09:15-09:30</td>
<td>SaAT13.6</td>
<td>Schaldach</td>
<td>Predicting Rapid Progression of Parkinson's Disease at Baseline Patients Evaluation</td>
<td>Tsiouris, Kostas (Biomedical Engineering Laboratory, School of Electrical and Comp); Rigas, Georgios (Univ. of Ioannina); Gatsios, Dimitris (Univ. of Ioannina); Antonini, Angelo (IRCCS Fondazione Ospedale San Camillo, Division of Parkinson's Di); Konitsiotis, Spiros (Medical School, Univ. of Ioannina); Koutsouris, Dimitrios (Biomedical Engineering Laboratory, School of Electrical and Comp); Fotiadis, Dimitrios I.* (Univ. of Ioannina)</td>
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<td>08:00-09:30</td>
<td>SaAT14</td>
<td>Schaldach</td>
<td>Imaging-Based Biomarkers (Oral Session)</td>
<td>Chair: Park, Hyunjin (Sungkyunkwan University)</td>
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<td>08:00-08:15</td>
<td>SaAT14.1</td>
<td>Schaldach</td>
<td>Colorimetric Recognition for Urinalysis Dipsticks based on Quadratic Discriminant Analysis</td>
<td>Dong, Kai (Nanjing Univ. of Science &amp; Tech.); Dong, Tao* (Univ. College of Southeast Norway - HSN, TekMar)</td>
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<td>08:15-08:30</td>
<td>SaAT14.2</td>
<td>Schaldach</td>
<td>Automatic Detection of Periodontitis using Intra-Oral Images</td>
<td>Tabatabaei Balaei, Asghar* (Univ. of Sydney); de Chazal, Philip (Univ. of Sydney); Eberhard, Joerg (Univ. of Sydney); Ruiz, Kate (Univ. of Sydney); Spahr, Axel (Univ. of Sydney); Domnisch, Henrik (Charite Univ., Berlin)</td>
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<td>08:30-08:45</td>
<td>SaAT14.3</td>
<td>Schaldach</td>
<td>Content-Based Retrieval for Lung Nodule Diagnosis using Learned Distance Metric</td>
<td>Wei, Guohui (Northeastern University); Ma, He* (Northeastern University); Qian, Wei (Northeastern University); Jiang, Hongyang (Sino-Dutch Biomedical and Information Engineering School, Northe); Zhao, Xinzhuo (Northeastern University)</td>
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<td>08:45-09:00</td>
<td>SaAT14.4</td>
<td>Schaldach</td>
<td>11C-PIB PET Image Analysis for Alzheimer's Diagnosis using Weighted Voting Ensembles</td>
<td>Wu, Wenjun (Georgia Institute of Technology); Venugopal, Janani (Georgia Institute of Technology); Wang, May D.* (Georgia Tech and Emory University)</td>
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<tr>
<td>09:00-09:15</td>
<td>SaAT14.5</td>
<td>Schaldach</td>
<td>Touch-Free Reaching Task for Parkinson's Disease Patients: A Motion Sensing Approach</td>
<td>Salimpour, Yousef* (Johns Hopkins School of Medicine); Chien, Jui-Hong (Johns Hopkins University); Lee, Sangwon (Johns Hopkins School of Medicine); Liu, Chang-Chia (Johns Hopkins University); Guadix, Sergio (Johns Hopkins University, University of Pennsylvania); Mills, Kelly (Johns Hopkins University); Anderson, William S. (Johns Hopkins School of Medicine, Dept. of Neurosurgery)</td>
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<td>09:15-09:30</td>
<td>SaAT14.6</td>
<td>Schaldach</td>
<td>Imaging Genetics Approach to Predict Progression of Parkinson's Diseases</td>
<td>Kim, Mansu (Sungkyunkwan University); Son, Seong-Jin (Sungkyunkwan University); Park, Hyunjin* (Sungkyunkwan University)</td>
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<tr>
<td>08:00-09:30</td>
<td>SaAT16</td>
<td>Rushmer</td>
<td>Haptics (Oral Session)</td>
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<tr>
<td>08:00-08:15</td>
<td>SaAT16.1</td>
<td>Rushmer</td>
<td>Development and Control of a Magnetorheological Haptic Device for Robot Assisted Surgery</td>
<td>Shokrollahi, Elnaz* (University of Toronto); Goldenberg, Andrew A. (University of Toronto); Drake, James (University of Toronto, CIGITI, Hospital for Sick Children); Eastwood, Kyle (University of Toronto); Kang, Matthew (University of Toronto)</td>
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<td>08:15-08:30</td>
<td>SaAT16.2</td>
<td>Rushmer</td>
<td>Haptic fMRI: Reliability and Performance of Electromagnetic Haptic Interfaces for Motion and Force Neuroimaging Experiments</td>
<td>Menon, Samir* (Stanford University); Zhu, Jack (Stanford University); Goyal, Deeksha (Stanford University); Khatib, Oussama (Stanford University)</td>
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Grasper Integrated Tri-Axial Force Sensor System for Robotic Minimally Invasive Surgery

Dai, Yuan* (University of California, Los Angeles); Abiri, Ahmad (University of California, Los Angeles); Liu, Siyuan (University of California Los Angeles); Paydar, Omeed (University of California, Los Angeles); Sohn, Hyunmin (University of California, Los Angeles); Dutson, Erik P. (UCLA); Grundfest, Warren S. (UCLA); Candler, Robert (University of California, Los Angeles)

Three-Axis Force Sensor with Fiber Bragg Grating

Choi, Hyun Do (SAIT (Samsung Advanced Institute of Technology)); Lim, Yo-An (Samsung Advanced Institute of Technology, Samsung Electronics); Kim, Jun Hyung* (Samsung Electronics Co.)

Positioning the Endoscope in Laparoscopic Surgery by Foot: Influential Factors on Surgeons’ Performance in Virtual Trainer

Abdi, Elahe* (EPFL); Bouri, Mohamed (EPFL); Burdet, Etienne (Imperial College of Science, Technology and Medicine); Himidan, Sharifa (Hospital of SickKids); Bleuler, Hannes (EPFL)

Estimation of Coherence using the Median is Robust against EEG Artefacts

Dukic, Stefan (Trinity College Dublin); Iyer, Parameswaran M. (Trinity College Dublin); Mohr, Kieran (Trinity College Dublin); Hardiman, Orla (Trinity College Dublin); Lalor, Edmund (Trinity College Dublin); Nasseroleslami, Bahman* (Trinity College Dublin)

Brain Connectivity Networks at the Basis of Human Attention Components: An EEG Study

Anzolin, Alessandra* (Univ. of Rome Sapienza, Neuroelectrical Imaging and BCI Lab IRCCS Fondazione Santa Lucia); Mattia, Donatella (Fondazione Santa Lucia IRCCS); Toppi, Jenia (University of Rome “Sapienza”); Pichiorri, Floriana (Fondazione Santa Lucia, IRCCS, Rome, Italy); Riccio, Angela (Neuroelectrical Imaging and BCI Lab IRCCS Fondazione Santa Lucia); Astolfi, Laura (University of Rome Sapienza)

Graph Theoretical Analysis of EEG Functional Network during Multi-Workload Flight Simulation Experiment in Virtual Reality Environment

Zhang, Shengqian (National University of Singapore); Zhang, Yuan (National University of Singapore); Sun, Yu (National University of Singapore); Thakor, Nitish (Johns Hopkins University); Bezerianos, Anastasios* (National University of Singapore)

How the Workload Impacts on Cognitive Cooperation: A Pilot Study

Sciarraffa, Nicolina (Dept. of Computer, Control and Management Engineering, Univ); Borghini, Gianluca (University of Rome Sapienza); Arico, Pietro (Fondazione Santa Lucia); Di Flumeri, Gianluca* (University of Rome Sapienza); Toppi, Jenia (University of Rome “Sapienza”); Colosimo, Alfredo (University of Rome “Sapienza”); Bezerianos, Anastasios (National University of Singapore); Thakor, Nitish (Johns Hopkins University); Babiloni, Fabio (University of Rome)

Community Detection: Comparison among Clustering Algorithms and Application to EEG-Based Brain Networks

Puxeddu, Maria Grazia (Sapienza, University of Rome); Petti, Manuela* (Univ. of Rome “Sapienza”, Neuroelectrical Imaging and BCI Lab IR); Pichiorri, Floriana (Fondazione Santa Lucia, IRCCS, Rome, Italy); Cincotti, Febo (Sapienza University of Rome); Mattia, Donatella (Fondazione Santa Lucia IRCCS); Astolfi, Laura (University of Rome Sapienza)
Modelling Interactions between Blood Pressure and Brain Activity in Preterm Neonates
Semenova, Oksana* (University College Cork); Lightbody, Gordon (University College Cork); O'Toole, John M. (University College Cork); Boylan, Geraldine (University College Cork); Dempsey, Eugene (Irish Centre for Fetal and Neonatal Translational Research (INFA); Temko, Andriy (University College Cork)

SaAT18: 08:00-09:30
Time-Frequency and Time-Scale Analysis – Cardiovascular Signals (Oral Session)

08:00-08:15
An Analysis Method for Wearable Electrocardiogram Measurement based on Non-Orthogonal Complex Wavelet Expansion
Shimauchi, Suehiro* (NTT Corporation); Eguchi, Kana (NTT Corporation); Takeda, Toki (NTT Service Evolution Laboratories); Aoki, Ryosuke (NTT Corporation)

08:15-08:30
Smooth Bandpass Empirical Mode Decomposition with Rolling Ball Sifting for Extracting Carotid Bruits and Heart Sounds
Huang, Adam* (National Central University); Liu, Min-Yin (National Central University); Lee, Chung-Wei (National Taiwan University Hospital); Liu, Hon-Man (National Taiwan University)

08:30-08:45
Automatic Atrial Fibrillation Detection: A Novel Approach using Discrete Wavelet Transform and Heart Rate Variability
Bruun, Iben Hervold* (Technical University of Denmark); Hissabu, Semira M. S. (Technical University of Denmark); Poulsen, Erik S. (Cortrium ApS); Putthusserypady, Sadasivan (Technical University of Denmark)

08:45-09:00
Comparison of Frequency-Based Techniques for Assessment of Baroreceptor Sensitivity and Heart Rate Variability
Ramachandran, Harish (Macquarie University); Butlin, Mark (Macquarie University); Quinn, Barry (Macquarie University); Avolio, Alberto P* (Macquarie University); Town, Graham (Macquarie University)

09:00-09:15
Discrimination of Multiple Stress Levels in Virtual Reality Environments using Heart Rate Variability
Ham, Jinsil* (Gwangju Institute of Science and Technology (GIST)); Cho, Dongrae (Gwangju Institute of Science and Technology); Oh, Jooyoung (Gwangju Institute of Science and Technology); Lee, Boreom (Gwangju Institute of Science and Technology (GIST))

09:15-09:30
Contribution of Body Movements on the Heart Rate Variability during High Intensity Running
Alikhani, Iman* (University of Oulu); Noponen, Kai (University of Oulu); Seppänen, Tapio (University of Oulu)

SaBT1: 10:50-12:20
Physiological Systems Modeling I (Oral Session)
Chair: Fanelli, Andrea (Massachusetts Institute of Technology)

10:50-11:05
Detection of Sympathoadrenal Discharge by Parameterisation of Skin Conductance and ECG Measurement
Tronstad, Christian* (Oslo University Hospital); Elvebakk, Ole (Oslo University Hospital); Kalvøy, Haavard (Rikshospitalet); Bjørgaas, Marit Ragnhild (St.Olavs Hospital); Martinsen, Ørjan G (University of Oslo)

11:05-11:20
Regression-Based Noninvasive Estimation of Intracranial Pressure
Fanelli, Andrea (Massachusetts Institute of Technology); Vonberg, Frederick William (Boston Children's Hospital, Harvard University); Jaireshkant, Rohan (Massachusetts Institute of Technology); Imaduddin, Syed (Massachusetts Institute of Technology); Tasker, Robert (Boston Children's Hospital); Heldt, Thomas* (Massachusetts Institute of Technology)
Correction of Tissue Oxygen Saturations using Arterial Oxygen Levels for Cerebrovascular Autoregulation Analysis

Antunes, Andre* (Medtronic); Addison, Paul (Medtronic); Montgomery, Dean (Univ. of Edinburgh); Borg, Ulf (Medtronic)

Unsupervised Gait Detection using Biomechanical Restrictions

Hotta, Shinji* (Fujitsu Laboratories Ltd.); Inomata, Akihiro (Fujitsu Japan); Sasamoto, Yuki (Fujitsu Laboratories Ltd.); Washizawa, Shiho (Fujitsu Laboratories Ltd.); Caulfield, Brian (UCD)

Model Selection for the Pulse Decomposition Analysis of Fingertip Photoplethysmograms

Tigges, Timo* (Technical University Berlin); Pielmus, Alexandru Gabriel (Technical University Berlin); Klum, Michael (Technical University Berlin); Feldheiser, Aarne (Charité Campus Virchow-Klinikum); Hunsicker, Oliver (Charité Campus Virchow-Klinikum); Orglmeister, Reinhold (Technische Universität Berlin)

On a Unified Point Process Approach for the Characterization of Bioelectric Discrete Phenomena

Yana, Kazuo* (Hosei University); Mino, Hiroyuki (Kanto Gakuin University)

Hemodynamic Response to Optogenetic Stimulation Varied under Different Stimulus Parameters

Bo, Bin (Shanghai Jiao Tong Univ.); Li, Wanlu (Shanghai Jiao Tong Univ.); Wang, Yongting (Shanghai Jiao Tong Univ.); Li, Yao* (Shanghai Jiao Tong Univ.); Tong, Shanbao (Shanghai Jiao Tong Univ.)

Phase-Domain Photoacoustics Eliminating Acoustic Detection Variations

Duan, Tingyang (Shanghai Tech Univ.); Zhang, Ruochong (Nanyang Technological Univ.); Feng, Xiaohua (Nanyang Technological Univ.); Liu, Siyu (Nanyang Technological Univ.); Ding, Ran (Nanyang Technological Univ.); Zheng, Yuanjin (Nanyang Technological Univ.); Gao, Fei* (Shanghai Tech Univ.)

An Iterative Weighted Method based on YALL1 for Cone-Beam X-Ray Luminescence Optical Tomography Imaging: A Phantom Experimental Study

Zhao, Lili (Shanghai University); Jiang, Jiehui (Shanghai University); Shu, Yuexia (Shanghai University); Yan, Zhuangzhi (Shanghai University); Liu, Xin* (Shanghai University)

A Fast Forward Solver of Fluorescence Diffuse Optical Tomography based on the Lattice Boltzmann Method

Zhang, Wenqing (Shanghai Univ.); Yan, Zhuangzhi* (Shanghai Univ.); Jiang, Jiehui (Shanghai Univ.)

A Dual-Modality Optical Coherence Tomography and Selective Plane Illumination Microscopy System for Mouse Embryonic Imaging

Larin, Kirill* (University of Houston)

Label-Free Hyperspectral Imaging and Quantification Methods for Surgical Margin Assessment of Tissue Specimens of Cancer Patients

Fei, Baowei* (Emory University and Georgia Institute of Technology)
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<td>Histologic Image Analysis (Oral Session)</td>
<td>Song, Cheol (DGIST)</td>
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<td>10:50-11:05</td>
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<td>SaBT3.1</td>
<td>Multiplexed Immunohistochemistry Image Analysis using Sparse Coding</td>
<td>Chang, Young Hwan* (Oregon Health and Science University); Tsujikawa, Takahiro (Oregon Health and Science University); Margolin, Adam (Oregon Health and Science University); Coussens, Lisa M. (Oregon Health and Science University); Gray, Joe (Oregon Health &amp; Science University)</td>
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<td>SaBT3.2</td>
<td>Histopathological Image Classification with Bilinear Convolutional Neural Networks</td>
<td>Chaofeng, Wang (Shanghai University); Shi, Jun* (Shanghai University); Zhang, Qi (Shanghai University); Ying, Shihui (Shanghai University)</td>
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<td>SaBT3.3</td>
<td>Angiosome based Time Series Analysis of Deep Tissue Perfusion using Diffuse Speckle Contrast Analysis</td>
<td>Yeo, Chaebom (DGIST); Lee, Kijoon (DGIST); Song, Cheol* (DGIST)</td>
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<td>SaBT3.4</td>
<td>Human Induced Pluripotent Stem Cell Region Recognition in Microscopy Images using Convolutional Neural Networks</td>
<td>Chang, Yuan-Hsiang (Chung Yuan Christian University); Abe, Kuniya (Mammalian Genome Dynamics, RIKEN BioResource Center); Yokota, Hideo (RIKEN Center for Advanced Photonics); Lin, Cheng-Yu (Chung Yuan Christian University); Sudo, Kazuhiro (BioResource Center, RIKEN); Nakamura, Yukio (RIKEN BioResource Center); Tsai, Ming-Dar* (Chung-Yuan Christian University)</td>
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<td>SaBT3.5</td>
<td>Analysis of Mitochondrial Shape Dynamics using Large Deformation Diffeomorphic Metric Curve Matching</td>
<td>Yang, Huilin (Carnegie Mellon University); Wang, Jing (Carnegie Mellon University); Tang, Hailiyun (Carnegie Mellon University); Ba, Qinle (Carnegie Mellon University); Yang, Ge (Carnegie Mellon University); Tang, Xiaoying* (Sun Yat-sen University-Carnegie Mellon University (SYSU-CMU) Joi)</td>
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<td>SaBT3.6</td>
<td>Tissue Classification in a Canine Model of Duchenne Muscular Dystrophy using Quantitative MRI Parameters</td>
<td>Eresen, Aydin (Texas A&amp;M University); Sharla, Birch (Texas A&amp;M University); McConnell, Stephen (Texas A&amp;M University); Griffin, Jay (Texas A&amp;M University); Kornegay, Joe (Texas A&amp;M University); Ji, Jim Xiuquan* (Texas A&amp;M University)</td>
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<td>SaBT4</td>
<td>10:50-12:20</td>
<td>Min Room</td>
<td>Physiological Monitoring I (Oral Session)</td>
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Modified Automatic R-Peak Detection Algorithm for Patients with Epilepsy using a Portable Electrocardiogram Recorder

Jeppesen, Jesper* (Aarhus University); Beniczky, Sandor (Danish Epilepsy Centre); Fuglsang-Frederiksen, Anders (Dept. of Neurophysiology, Aarhus University Hospital, 8000); Sidenius, Per (Dept. of Neurology, Aarhus University Hospital); Johansen, Peter (University of Aarhus, Faculty of Science and Technology)

Real-Time Estimation of Eye Gaze from In-Ear Electrodes

Favre-Félix, Antoine* (Eriksholm Research Centre); Graversen, Carina (Eriksholm Research Centre); Dau, Torsten (Technical University of Denmark); Lunner, Thomas (Eriksholm Research Centre - part of Oticon)

PPG Pulse Direction Determination Algorithm for PPG Waveform Inversion by Wrist Rotation

Choi, Changmok* (Samsung Electronics Co., Ltd.); Ko, Byung-Hoon (Samsung Advanced Institute of Technology); Lee, Jongwook (Samsung Electronics); Yoon, Seung Keun (Samsung Advanced Institute of Technology); Kwon, Uikun (Samsung Electronics); Kim, Sang Joon (Samsung Electronics); Kim, Youn Ho (Samsung Advanced Institute of Technology)

NFC-Enabled, Tattoo-Like Stretchable Biosensor Manufactured by “Cut-and-Paste” Method

Jeong, Hyoyoung (University of Texas at Austin); Ha, Taewoo (The University of Texas at Austin); Kuang, Irene (The University of Texas at Austin); Shen, Linxia (University of Texas at Austin); Dai, Zhaohui (The University of Texas at Austin); Sun, Nan (University of Texas at Austin); Lu, Nanshu* (University of Texas at Austin)

Impedimetric Investigation of Dual Electrical Properties of Reduced Graphene-Oxide-Based Biosensors in the Detection of Dopamine

Lin, Shu-Ping* (National Chung Hsing University); Ciou, Jhong-Yi (Graduate Institute of Biomedical Engineering, National Chung Hsi); Lai, Tung-Yen (National Nano Device Laboratories); Lin, Tsung-Wu (the Dept. of Chemistry, Tung Hai University)

Estimating the Lower Leg Muscle Activity from Distal Biosignals Around the Ankles

Isezaki, Takashi* (University of Tsukuba); Watanabe, Tomoki (NTT Corporation); Yamada, Tomohiro (NTT); Kadone, Hideki (University of Tsukuba); Suzuki, Kenji (University of Tsukuba)

Tumor Size and Elasticity Estimation using Smartphone-Based Compression-Induced Scope

Won, Chang-Hee* (Temple University); Goldstein, Jesse (Temple University); Oleksyuk, Vira (Temple University); Caroline, Dina (Temple University Hospital); Pascarella, Suzanne (Temple University Hospital)

Full Factorial Analysis of Variance to Assess Statistical Significance of Laplacian Estimation Accuracy Improvement Due to Novel Variable Inter-Ring Distances Concentric Ring Electrodes

Makeyev, Oleksandr (Diné College); Joe, Cody (Diné College); Lee, Colin (Diné College); Besio, W. G.* (University of Rhode Island)

RATT: RFID Assisted Tracking Tile – Preliminary Results

Quiñones, Dario Ruben (Center for Biomaterials and Tissue Engineering, Universitat Poli); Cuevas, Aarón (Center for Biomaterials and Tissue Engineering, Universitat Poli); Cambra, Javier (Center for Biomaterials and Tissue Engineering, Universitat Poli); Canals, Santiago (Instituto de Neurociencias, Consejo Superior de Investigaciones); Moratal, David* (Universitat Politècnica de València)
### SaBT7: 10:50-12:20  
**Herrick Room**  
**Rehabilitation Robotics and Biomechanics** (Oral Session)  
**Chair:** Patton, James and Ryan, Shirley (U. Illinois at Chicago (UIC) and Ability Lab (formerly RIC))

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<td>10:50-10:55</td>
<td>SaBT7.1</td>
<td><strong>Analysis of Muscle Activation in Lower Extremity for Static Balance</strong></td>
<td>Chakravarty, Kingshuk (Tata Consultancy Services Ltd.); Chatterjee, Debati (TCS Innovation Lab); Das, Rajat Kumar (TCS Innovation Lab); Tripathy, Soumya Ranjan (TCS Research and Innovation, Tata Consultancy Services Ltd.); Sinha, Aniruddha* (Tata Consultancy Services Ltd.)</td>
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<td>11:05-11:20</td>
<td>SaBT7.2</td>
<td><strong>A New Robotic Approach to Characterize Mechanical Impedance and Energetic Passivity of the Human Ankle during Standing</strong></td>
<td>Lee, Hyunglae* (Arizona State University); Nalam, Varun (Arizona State University)</td>
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<td>11:20-11:35</td>
<td>SaBT7.3</td>
<td><strong>Design and Control of a 3-DOF Rehabilitation Robot for Forearm and Wrist</strong></td>
<td>Luo, Lincong (Institute of Automation, Chinese Academy of Sciences); Peng, Liang (Institute of Automation, Chinese Academy of Sciences); Hou, Zeng-Guang* (Institute of Automation, Chinese Academy of Sciences); Wang, Weiqun (Institute of Automation, Chinese Academy of Sciences)</td>
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<td>11:35-11:50</td>
<td>SaBT7.4</td>
<td><strong>Estimation of Tibialis Anterior Muscle Stiffness during the Swing Phase of Walking with Various Footwear</strong></td>
<td>Uchiyama, Takanori* (Keio University); Hori, Yutaka (Keio University); Suzuki, Kenta (Keio University)</td>
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<td>11:50-11:55</td>
<td>SaBT7.5</td>
<td><strong>Design of Anisotropic Pneumatic Artificial Muscles and their Applications to Soft Wearable Devices for Text Neck Symptoms</strong></td>
<td>Kim, Hojoong (Seoul National Univ.); Park, Hyuntae (Seoul National Univ.); Kim, Jongwoo (Biorobotics LAB, Seoul National Univ.); Cho, Kyu-Jin (Seoul National Univ.); Park, Yong-Lae* (Carnegie Mellon Univ.)</td>
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<tr>
<td>12:00-12:15</td>
<td>SaBT7.6</td>
<td><strong>Impact of Actuator Impedance Characteristics on Motor Control of Assisted Hand Movements</strong></td>
<td>Sandri Heidner, Gustavo (The Catholic University of America); Vermillion, Billt (Catholic University of America); Lee, Sang Wook* (Catholic University of America)</td>
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### SaBT8: 10:50-12:20  
**Schwan Room**  
**Brain Functional Imaging I** (Oral Session)  
**Chair:** Sun, Junfeng (Shanghai Jiao Tong University)

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<td>10:50-11:05</td>
<td>SaBT8.1</td>
<td><strong>Decoding Emotional Valence from Electroencephalographic Rhythmic Activity</strong></td>
<td>Celikkkanat, Hande* (University of Helsinki); Moriya, Hiroki (ATR Cognitive Mechanisms Laboratories); Ogawa, Takeshi (ATR Cognitive Mechanisms Laboratories); Kauppi, Jukka-Pekka (University of Jyväskylä); Kawanabe, Motoaki (ATR Cognitive Mechanisms Laboratories); Hyvärinen, Aapo (University of Helsinki)</td>
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<td>11:05-11:20</td>
<td>SaBT8.2</td>
<td><strong>Self-Regulation of Primary Motor Cortex Activity with Motor Imagery Induces Functional Connectivity Modulation: A Real-Time fMRI Neurofeedback Study</strong></td>
<td>Makary, Meena M.* (Kyung Hee Univ.); Eun, Seulgi (Kyung Hee Univ.); Park, Kyungmo (Kyung Hee Univ.)</td>
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<td>11:20-11:35</td>
<td>SaBT8.3</td>
<td><strong>Identifying the Effects of Microsaccades in Tripolar EEG Signals</strong></td>
<td>Bellisle, Rachel* (University of Rhode Island); Steele, Preston (CREmedical Corp., Kingston, RI); Bartels, Rachel (CREmedical Corp.); Ding, Lei (University of Oklahoma); Sunderam, Sridhar (University of Kentucky); Besio, W. G. (University of Rhode Island)</td>
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<td>11:35-11:50</td>
<td>SaBT8.4</td>
<td>Decreased Variability of Dynamic Phase Synchronization in Brain Networks during Hand Movement</td>
<td>Cheng, Lin (Shanghai Jiao Tong Univ.); Zhu, Hong (Shanghai Jiao Tong Univ.); Zhu, Yang (Shanghai Second People's Hospital); He, Naying (Shanghai Jiao Tong Univ.); Yang, Yang (Shanghai Second People's Hospital); Ling, Huawei (Shanghai Jiao Tong Univ.); Tong, Shanbao (Shanghai Jiao Tong Univ.); Fu, Yi (Rui Jin Hospital, Shanghai Jiao Tong Univ. School of Medici); Sun, Junfeng* (Shanghai Jiao Tong Univ.)</td>
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<tr>
<td>11:50-12:05</td>
<td>SaBT8.5</td>
<td>EEG-Based Biometry using Steady State Visual Evoked Potentials</td>
<td>Falzon, Owen* (University of Malta); Zerafa, Rosanne (University of Malta); Camilleri, Tracey (University of Malta); Camilleri, Kenneth Patrick (University of Malta)</td>
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<tr>
<td>12:05-12:20</td>
<td>SaBT8.6</td>
<td>Passive Functional Mapping Guides Electrical Cortical Stimulation for Efficient Determination of Eloquent Cortex in Epilepsy Patients</td>
<td>Prueckl, Robert* (g.tec medical engineering GmbH); Kapeller, Christoph (g.tec medical engineering GmbH); Gruenwald, Johannes (Johannes Kepler University Linz); Ogawa, Hiroshi (Asahikawa Medical University); Kamada, Kyousuke (Asahikawa Medical University); Korostenskaja, Milena (Florida Hospital for Children, Comprehensive Pediatric Epilepsy); Swift, James (g.tec neurotechnologies USA); Scharinger, Josef (Dept. of Computational Perception, Johannes Kepler University); Cho, Woosang (University of Tubingen); Edlinger, Günter (g.tec medical engineering GmbH); Guger, Christoph (g.tec medical engineering GmbH)</td>
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<th>Session</th>
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<td>SaBT9: 10:50-12:20 Plonsey Room</td>
<td>Human Performance I (Oral Session)</td>
<td>Chair: Huang, Yufei (University of Texas at San Antonio)</td>
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<td>10:50-11:05</td>
<td>Prediction of Fatigue-Related Driver Performance from EEG Data by Deep Riemannian Model</td>
<td>Hajinoroozi, Mehdi* (The University of Texas at San Antonio); Zhang, Jianqiu (Michelle) (University of Texas at San Antonio, Electrical and Computer Engi); Huang, Yufei (University of Texas at San Antonio)</td>
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<td>11:05-11:20</td>
<td>Assessment of Auditory Impression of the Coolness and Warmness of Automotive HVAC Noise</td>
<td>Nakagawa, Seiji* (Chiba University); Hotehama, Takuya (National Institute of Advanced Industrial Science and Technology); Kamiya, Masaru (Denso Corporation)</td>
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<td>11:20-11:35</td>
<td>Virtual Reality Body Motion Induced Navigational Controllers and their Effects on Simulator Sickness and Pathfinding</td>
<td>Aldaba, Cassandra* (University of Manitoba); White, Paul (University of Manitoba); Byagowi, Ahmad (University of Manitoba); Moussavi, Zahra (University of Manitoba)</td>
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<td>11:35-11:50</td>
<td>Hedonic Editing and Order Effect in Decision-Making with Neurometric Evaluation</td>
<td>Babiloni, Fabio* (University of Rome); Yang, Wenting (Dept. of Psychology and Behavioral Science, Zhejiang Univer); Di Flumeri, Gianluca (University of Rome Sapienza)</td>
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<td>11:50-12:05</td>
<td>Bayesian Multi-Subject Factor Analysis to Predict Microsleeps from EEG Power Spectral Features</td>
<td>Shoorangiz, Reza* (University of Canterbury); Weddell, Stephen J. (University of Canterbury); Jones, Richard D. (New Zealand Brain Research Institute)</td>
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<td>12:05-12:20</td>
<td>A System for Accelerometer-Based Gesture Classification using Artificial Neural Networks</td>
<td>Stephenson, Robert (University of Technology Sydney); Naik, Ganesh R (University of Technology Sydney); Chai, Rifai* (University of Technology, Sydney)</td>
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**Health Informatics – Decision Support Methods and Systems I (Oral Session)**

**Chair:** Nguyen, Hung T. (University of Technology, Sydney)

10:50-12:20 **SaBT10**

**Stenosis Detection and Quantification on Cardiac CTA using Panoramic MIP of Coronary Arteries**

Chi, Yanling* (Institute for Infocomm Research); Huang, Weimin (Institute for Infocomm Research, Agency for Science Technology); Zhou, Jiayin (Institute for Infocomm Research, A*STAR); Zhang, Jun-Mei (National Heart Center); Wong, Philip (National Heart Centre Singapore); Lim, Sook Teik (National Heart Centre Singapore); Tan, Ru San (National Heart Center); Zhong, Liang (National Heart Centre Singapore)

SaBT10.1

11:05-12:20 **SaBT11**

**Whole-Body, Organ, and Tissue Computational Models**

**Chair:** Dokos, Socrates (University of New South Wales)

10:50-12:20 **SaBT11.1**

**Evaluation of Ultrasonic Scattering for Different Cortical Bone Porosities and Excitation Frequencies: A Numerical Study**

Potsika, Vassiliki (Unit of Medical Technology and Intelligent Information Systems); Grivas, Konstantinos (Dept. of Mechanical Engineering and Aeronautics, University); Gortsas, Theodoros (Dept. of Mechanical Engineering and Aeronautics, University); Protopappas, Vasilios C. (University of Patras); Polyzos, Demosthenes (University of Patras); Fotiadis, Dimitrios I.* (University of Ioannina)

SaBT11.2

11:05-12:20 **SaBT11.2**

**A Framework for Simulating Gastric Electrical Propagation in Confocal Microscopy Derived Geometries**

Krohn, Berit (University of Stuttgart); Sathar, Shameer (University of Auckland); Röhrl, Oliver (University of Stuttgart); Vanderwinden, Jean-Marie (Université libre de Bruxelles); O’Grady, Gregory (University of Auckland); Cheng, Leo K* (The University of Auckland)

SaBT11.3

11:20-12:05 **SaBT11.3**

**Prediction of Hip Fracture in Post-Menopausal Women using Artificial Neural Network Approach**

Ho-Le, Thao P.* (University of Technology, Sydney, Australia); Center, Jackie R (Garvan Institute of Medical Research); Eisman, John A. (Garvan Institute of Medical Research); Nguyen, Tuan V. (University of Technology, Sydney, Australia); Nguyen, Hung T. (University of Technology, Sydney)

SaBT11.4

11:50-12:20 **SaBT11.4**

**Prediction of Hip Fracture in Post-Menopausal Women using Artificial Neural Network Approach**

11:50-12:05 **SaBT11.5**

**A Non-Exercise based V02max Prediction using FRIEND Dataset with a Neural Network**

Henriques, Jorge* (University of Coimbra); de Carvalho, Paulo (University of Coimbra); Rocha, Teresa (Inst Superior de Eng de Coimbra); Paredes, Simao (Instituto Politécnico de Coimbra); Cabiddu, Ramona (Cardiopulmonary Physiotherapy Laboratory, Federal University of); Trimer, Renata (Cardiopulmonary Physiotherapy Laboratory, Federal University of); Mendes, Renata (Cardiopulmonary Physiotherapy Laboratory, Dept. of Physi); Borghi-Silva, Audrey (Cardiopulmonary Physiotherapy Laboratory, Federal University of); Lenny, Kaminsky (Fisher Institute of Health and Well-Being and Clinical Exercise); Euan, Ashley (Division of Cardiovascular Medicine, VA Palo Alto Healthcare Sys); Arena, Ross (University of Illinois at Chicago); Myers, Jonathan (Dept. of Cardiovascular Medicine, Stanford University, Palo)

SaBT11.6
Image-Based Fluid Dynamics Analysis of Left Ventricle Outflow Tract Pressure Gradient after Deployment Transcatheter Mitral Valve

Alharbi, Yousef S* (University of New South Wales, Biomedical Engineering); Lovell, Nigel H. (University of New South Wales); Otton, James (Cardiology Dept., Liverpool Hospital, Sydney); Muller, David (Cardiology Dept., St Vincent's Hospital, Sydney); Al Abed, Amr (University of New South Wales); Dokos, Socrates (University of New South Wales)

The Visible Human Project Male CAD based Computational Phantom and Its use in Bioelectromagnetic Simulations

Noetscher, Gregory* (Worcester Polytechnic Institute); Htet, Aung Thu (Worcester Polytechnic Institute); Maino, Nicholas (Worcester Polytechnic Institute); Lacroix, Patrick (wpi)

Evaluation of a Laser-Based Sensor for the Diagnosis of Neurological Disorders

Tenner, Felix* (Lehrstuhl für Photonische Technologien); Regensburger, Martin (Clinic of Neurology, Friedrich-Alexander-Universität Erlangen-Nü); Schramm, Axel (Univ. Hospital Erlangen); Söhle, Mona (Institute of Photonic Technologies, Friedrich-Alexander-Universität); Schwarzkopf, Karen (Institute of Photonic Technologies, Friedrich-Alexander-Universität); Zalevsky, Zeev (Nano Photonics Center at The Institute of Nanotechnology and Adv); Schmidt, Michael (Institute of Photonic Technologies, Friedrich-Alexander-Universität)

A Biopendance Sensing System for In-Vivo Cancer Tissue Identification: Design and Preliminary Evaluation

Carpano Maglioli, Camilla* (Fondazione Istituto Italiano di Tecnologia); Caldwell, Darwin G. (Italian Institute of Technology); Mattos, Leonardo (IIT - Istituto Italiano di Tecnologia)

Automatic Characterization of User Errors in Spirometry

Luo, Andrew* (University of Washington); Whitmire, Eric (University of Washington); Stout, James (University of Washington); Martenson, Drew (Glendale Adventist Medical Center); Patel, Shwetak (University of Washington)

Robot-Assisted Mirroring Exercise as a Physical Therapy for Hemiparesis Rehabilitation

Kim, Jihun (Handong Global University); Kim, Jaehyo* (Handong Global University)

PhoneQuant: A Smartphone-Based Quantitative Immunoassay Analyser

Shah, Malay Ilesh* (Healthcare Technology Innovation Center (HTIC), Indian Institute; Joseph, Jayaraj (HTIC, Indian Institute of Technology Madras); Sanne, Ujwal Sriharsha (Birla Institute of Technology and Science, Pilani); Sivaprakasam, Mohanasankar (Indian Institute of Technology Madras)

A New 4-DOF Parallel Robot for MRI-Guided Percutaneous Interventions: Kinematic Analysis

Kim, Jin Seob (Johns Hopkins Univ.); Levi, David (Johns Hopkins Univ.); Monfaredi, Reza (Children's National Health System); Cleary, Kevin (Children's National Medical Center); Iordachita, Iulian* (Johns Hopkins Univ.)

Transient Reduction in Theta Power Caused by Interictal Spikes in Human Temporal Lobe Epilepsy

Ge, Manling* (Hebei Univ. of Tech.); Guo, Jundan (Hebei Univ. of Tech.); Xing, Yangyang (Hebei Univ. of Tech.); Feng, Zhiguo (Hebei Univ. of Tech.); Lu, Weide (Hebei Univ. of Tech.); Ma, Xinlin (Hebei Univ. of Tech.); Geng, Yuehua (Hebei Univ. of Tech.); Zhang, Xin (Tianjin Polytechnic Univ.)
On the Detection of Peripheral Cyanosis in Individuals with Distinct Levels of Cutaneous Pigmentation
Baranoski, Gladimir Valerio Guimaraes* (University of Waterloo); Van Leeuwen, S.R. (University of Waterloo); Chen, Tenn Francis (University of Waterloo)

A New Alignment Free Genome Comparison Algorithm based on Statistically Estimated Feature Frequency Profile
Seo, Hyein (Korea Advanced Institute of Science and Technology (KAIST)); Cho, Dong-Ho* (Korea Advanced Institute of Science and Technology (KAIST))

Using Convolutional Neural Networks to Explore the Microbiome
Reiman, Derek (University of Illinois at Chicago); Metwally, Ahmed* (University of Illinois at Chicago); Dai, Yang (University of Illinois at Chicago)

Modeling the Effects of Amiodarone on Short QT Syndrome Variant 2 in the Human Ventricles
Luo, Cunjin* (Harbin Institute of Technology, School of Computer Science and Technology); Wang, Kuanquan (Harbin Institute of Technology); Zhang, Henggui (Harbin Institute of Technology, School of Computer Science and Technology)

Rendering Problem-Oriented CCD for Chronic Diseases
Bae, Sungchul* (Kyungpook National University); Kim, Il Kon (Kyungpook National University); Lee, Do-Youn (Kyungpook National University)

Automatic Diagnosis of Melanoma using Linear and Nonlinear Features from Digital Image
Munia, Tamanna Tabassum Khan (University of North Dakota); Alam, Md Nafiul (University of North Dakota); Neubert, Jeremiah (University of North Dakota); Fazel-Rezai, Reza* (University of North Dakota)

Improving ROI Detection in Photoplethysmographic Imaging with Thermal Cameras
Scebba, Gaetano* (ETH Zurich); Dragas, Jelena (ETH Zurich); Hu, Suyi (ETH Zurich); Karlen, Walter (ETH Zurich)

Smartphone based Automatic Organ Validation in Ultrasound Video
Vaish, Pallavi* (Indian Institute of Technology Hyderabad); Ramkrishna, Bharath (Indian Institute of Technology Hyderabad); P, Rajalakshmi (Indian Institute of Technology Hyderabad)

Considerations of Handheld Breathing Tracking via a Stabilized Eulerian Video Magnification Approach
Alam, Shafaf (University of Queensland); Singh, Surya P. N.* (The University of Queensland); Abeyratne, Udantha R (University of Queensland)

Neurological Activity Monitoring based on Video Inpainting
Schmale, Sebastian* (University of Bremen); Seidel, Pascal (University of Bremen); Thiermann, Steffen (University of Bremen); Paul, Steffen (University of Bremen)

A Study of Color Illumination Effect on the SNR of rPPG Signals
Lin, Yu-Chen* (National Taiwan University of Science and Technology); Lin, Yuan-Hsiang (National Taiwan University of Science and Technology)
**SaBT15: 10:50-12:20**  
**Medical Innovation and Translation (Oral Session)**  
**Chair:** Sunagawa, Kenji (Kyushu University)

10:50-11:05  
**SaBT15.1 Audible Capnometric Cues with End-Tidal Carbon Dioxide Improve the Quality of Patient Monitoring**  
Aoki, Toshiki* (Nihon Kohden Corporation); Inoue, Masayuki (Nihon Kohden Corporation); Miyasaka, Kiyoyuki (St. Luke’s International University)

11:05-11:20  
**SaBT15.2 DeepPredict: A Deep Predictive Intelligence Platform for Patient Monitoring**  
Chwyl, Brendan* (Univ. of Waterloo); Chung, Audrey Gina (Univ. of Waterloo); Shafiee, Mohammad Javad (Univ. of Waterloo); Fu, Yongji (Becton Dickinson Technologies); Wong, Alexander (Univ. of Waterloo)

11:20-11:35  
**SaBT15.3 Design, Implementation, and Evaluation of a Physiological Closed-Loop Control Device for Medically-Induced Coma**  
An, Jingzhi* (MIT); Purdon, Patrick L (Massachusetts General Hospital); Solt, Ken (Massachusetts General Hospital); Sims, Nat (MGH); Brown, Emery N (MGH-Harvard Medical School-MIT); Westover, Brandon (Massachusetts General Hospital)

11:35-12:05  
**SaBT15.4 A Novel Smart Lighting Clinical Testbed**  
Gleason, Joseph D. (The University of New Mexico); Oishi, Meeko* (University of New Mexico); Simkulet, Michelle (Rensselaer Polytechnic Institute); Arunas, Tuzikas (Rensselaer Polytechnic Institute); Brown, Lee (The University of New Mexico); Brueck, S. R. J. (The University of New Mexico); Karlicek, Robert F. (Rensselaer Polytechnic Institute)

12:05-12:20  
**SaBT15.6 Design of a Compact Collimator and 3D Imaging System for a Scanning Beam Low-Energy Intraoperative Radiation Therapy System for Pancreatic Cancer**  
Wears, Brennen (University of Iowa); Mohiuddin, Imran (University of Iowa); Flynn, Ryan (University of Iowa); Kim, Yusung (Dept. of Radiation Oncology, The University of Iowa, Iowa C); Waldron, Timothy (University of Iowa); Allen, Bryan (University of Iowa); Xia, Junyi* (University of Iowa)

**SaBT16: 10:50-12:20**  
**Surgical Robotics I (Oral Session)**  
**Chair:** Wang, Lei (Shenzhen Institutes of Advanced Technology)

10:50-11:05  
**SaBT16.1 Visible Forceps Manipulator with Novel Linkage Bending Mechanism for Neurosurgery**  
Zhang, Boyu (Tsinghua University); Liao, Zhuxiu (Tsinghua University); Liao, Hongen* (Tsinghua University)

11:05-11:20  
**SaBT16.2 A Targeted Drug Delivery Platform for Assisting Retinal Surgeons for Treating Age-Related Macular Degeneration (AMD)**  
Nasseri, M. Ali* (Technische Universitaet Muenchen); Maier, Mathias (Klinikum Rechst der isaar, Muenchen); Lohmann, Chris (Klinikum Rechst der isaar, Muenchen)
Needle Release Mechanism Enabling Multiple Insertions with an Ultrasound-Guided Prostate Brachytherapy Robot

Chen, Shuyang (Johns Hopkins University); Gonenc, Berk (Johns Hopkins University); Li, Meng (Johns Hopkins University); Song, Daniel (Johns Hopkins University); Burdette, Everette (Acoustic MedSystems, Inc.); Iordachita, Iulian (Johns Hopkins University); Kazanzides, Peter* (Johns Hopkins University)

A Master-Slave Control System with Workspaces Isomerism for Teleoperation of a Snake Robot

Ren, Lingxue* (Shenzhen Institutes of Advanced Tech., Chinese Academy of S); Olutunji Mumini, Omisore (Shenzhen Institutes of Advanced Tech., Chinese Academy of S); Shipeng, Han (Shenzhen Institutes of Advanced Tech., Chinese Academy of S); Wang, Lei (Shenzhen Institutes of Advanced Tech.)

Statistical Modeling on Motion Trajectories for Robotic Laparoscopic Surgery

Yang, Tao* (Institute of Infocomm Research); Huang, Weimin (Institute for Infocomm Research, Agency for Science Technology a); To, Kyaw Kyar (Institute for Infocomm Research, A*STAR)

Estimating Brain Connectivity when Few Data Points are Available: Perspectives and Limitations

Antonacci, Yuri (Univ. of Rome Sapienza); Toppi, Jlenia (Univ. of Rome "Sapienza"); Anzolin, Alessandra (Univ. of Rome "Sapienza", Neuroelectric Imaging and BCI Lab IR); Caschera, Stefano (Sapienza Univ. of Rome); Mattia, Donatella (Fondazione Santa Lucia IRCCS); Astolfi, Laura* (Univ. of Rome Sapienza)

Connectome Pattern Alterations with Increment of Mental Fatigue in One-Hour Driving Simulation

Chua, Bing Liang (National University of Singapore); Dai, Zhongxiang (Singapore Institute for Neurotechnology (SINAPSE), Centre for Li); Bezerianos, Anastasios* (National University of Singapore); Thakor, Nitish (Johns Hopkins University); Sun, Yu (National University of Singapore)

Transcranial Cerebellar Direct Current Stimulation: Effects on Brain Resting State Oscillatory and Network Activity

Petti, Manuela* (Univ. of Rome "Sapienza", Neuroelectric Imaging and BCI Lab IR); Astolfi, Laura (University of Rome Sapienza); Masciullo, Marcella (Fondazione Santa Lucia, Rome, Italy); Clausi, Silvia (Fondazione Santa Lucia, Rome, Italy); Pichiorri, Floriana (Fondazione Santa Lucia, IRCCS, Rome, Italy); Cinicci, Febo (Sapienza University of Rome); Mattia, Donatella (Fondazione Santa Lucia IRCCS); Molinari, Marco (Fondazione Santa Lucia, Rome, Italy)

Asymmetry of Hemispheric Interdependences in the Early Hours following Unilateral Stroke: An Electrophysiological Study in Rats

Guo, Xiaoli (Shanghai Jiao Tong University); Wu, Wenqing (Shanghai Jiao Tong University); Tong, Shanbao* (Shanghai Jiao Tong University)

Estimating Directed Brain-Brain and Brain-Heart Connectivity through Globally Conditioned Granger Causality Approaches

Duggento, Andrea* (University of Rome "Tor Vergata"); Passamonti, Luca (University of Cambridge); Guerrisi, Maria (University of Rome "Tor Vergata"); Valenza, Gaetano (University of Pisa); Barbieri, Riccardo (Politecnico di Milano); Toschi, Nicola (University of Rome "Tor Vergata", Faculty of Medicine)

Simultaneous Estimation of the In-Mean and In-Variance Causal Connectomes of the Human Brain

Duggento, Andrea* (Univ. of Rome "Tor Vergata"); Passamonti, Luca (Univ. of Cambridge); Guerrisi, Maria (Univ. of Rome "Tor Vergata"); Toschi, Nicola (Univ. of Rome "Tor Vergata", Faculty of Medicine)
10:50-11:05 A Marked Point Process Approach for Identifying Neural Correlates of Tics in Tourette Syndrome
Loza, Carlos* (University of Florida); Shute, Jonathan (University of Florida); Principe, Jose (University of Florida); Okun, Michael (University of Florida); Gunduz, Aysegul (University of Florida)

11:05-11:20 Measuring Brain Activation by using Baseline-Normalized Event-Related Spectral Perturbation in Working Memory Task
Phukhachee, Tustanah* (King Mongkut's Univ. of Technology Thonburi); Maneewongvatana, Suthathip (King Mongkut's Univ. of Technology Thonburi); Irimana, Keiji (Kyushu Univ.); Aungsuwanakul, Thanate (Kyushu Univ.); Kaewkamnerdpong, Boonserm (Biological Engineering Program, Faculty of Engineering, King Mon)

11:20-11:35 Real-Time Analysis on Ensemble SVM Scores to Reduce P300-Speller Intensification Time
Vo, Anh Kha* (University of Technology Sydney); Nguyen, Diep N. (University of Technology Sydney); Ha, Hoang Kha (HoChiMinh City University of Technology); Dutkiewicz, Eryk (University of Technology Sydney)

11:35-11:50 Evaluation of Logarithmic vs. Linear ADCs for Neural Signal Acquisition and Reconstruction
Pagin, Matteo* (University of Ulm); Ortmanns, Maurits (University of Ulm)

11:50-12:05 Quality Assessment of 3D Visualizations with Vertical Disparity: An ERP Approach
Shahbazi Avarvand, Forooz (Fraunhofer HHI); Bosse, Sebastian (Fraunhofer HHI); Nolte, Guido (Dept. of Neurophysiology, UKE, Hamburg); Wiegand, Thomas (HHI); Samek, Wojciech* (Fraunhofer HHI)

12:05-12:20 Detecting Abrupt Change in Neuronal Tuning via Adaptive Point Process Estimation
Chen, Junjun (Zhejiang University); Xu, Kai (Zhejiang University); Yang, Zaiyue (Zhejiang University); Wang, Yiwen* (Hong Kong University of Science and Technology)

14:20-14:35 Statistical Modeling of OCT Images by Asymmetric Normal Laplace Mixture Model
Jorjandi, Sahar (MUI); Rabbani, Hossein* (Isfahan Univ. of Medica Sciences); Kafieh, Rahele (Isfahan University of Medical Sciences); Amini, Zahra (MUI)

14:35-14:50 Tooth Cracks Detection and Gingival Sulcus Depth Measurement using Optical Coherence Tomography
Kang, Se Ryong (Seoul National University); Kim, Jun-Min (Seoul University); Yi, WonJin* (Seoul National Univ Sch of Dentistry)

14:50-15:05 Smart Data Augmentation for Surgical Tool Detection on the Surgical Tray
Alhajj, Hassan* (Inserm); Lamard, Mathieu (Université de Bretagne Occidentale); Cocherer, Béatrice (CHU Morvan); Quellec, Gwenole (Inserm)

15:05-15:20 Pyramid Approach for the Reduction of Parallax-Related Artefacts in Optical Recordings of Moving Translucent Volumes
Flotho, Philipp* (Systems Neuroscience and Neurotechnology Unit); Romero Santiago, Alejandro E. (Saarland University); Schwertfeger, Karsten (Saarland University Hospital); Hülser, Matthias (Saarland University Hospital); Haab, Lars (Saarland University Hospital); Strauss, Daniel J. (Saarland University, Medical Faculty)
15:20-15:35 SaCT2.5
Non-Rigid Registration of Fluorescein Angiography and Optical Coherence Tomography via Scanning Laser Ophthalmoscope Imaging ................................. 4415-4418
Rabbani, Hossein* (Isfahan Univ. of Medical Sciences); Mokhtary, Marzieh (Isfahan University of Medical Sciences); Ghasemi Kamasi, Zeinab (West Virginia University)

15:35-15:50 SaCT2.6
Motion Estimation of Subcellular Structures from Fluorescence Microscopy Images .................................. 4419-4422
Vallmitjana, Alex (Automatic Control Dept., Universitat Politècnica de Catalunya); Civera-Tregon, Azahara (Neurogenetics and Molecular Medicine, Sant Joan de Deu Research); Hoenicka, Janet (Instituto de Recerca Hospital Sant Joan de Deu, Barcelona); Palau, Francesc (Neurogenetics and Molecular Medicine, Sant Joan de Deu Research); Benitez, Raul* (Universitat Politècnica de Catalunya)

14:20-14:35 SaCT4.1
A Wearable Textile for Respiratory Monitoring: Feasibility Assessment and Analysis of Sensors Position on System Response ........................................................................ 4423-4426
Lo Presti, Daniela* (Campus Bio-Medico di Roma University); Massaroni, Carlo (Università Campus Bio-Medico di Roma); Saccomandi, Paola (University Campus Bio-Medico of Rome); Caponero, Michele Arturo (ENEA - Centro Ricerche Frascati); Formica, Domenico (Campus Bio-Medico University); Schena, Emiliano (University of Rome Campus Bio-Medico)

14:35-14:50 SaCT4.2
Electromagnetic Disturbances Rejection with Single Skin Contact in the Context of ECG Measurements with Cooperative Sensors .................................................. 4427-4430
Rapin, Michael* (Swiss Center for Electronics and Microtechnology, CSEM); Ferrario, Damien (CSEM); Haenni, Etienne (CSEM); Wacker, Josias (CSEM); Falhi, Abdessamad (CSEM); Meier, Christophe (CSEM SA); Porchet, Jacques-André (CSEM SA); Chételat, Olivier (CSEM)

14:50-15:05 SaCT4.3
A Pressure-Sensitive Palatograph for Speech Analysis ................................................................. 4431-4434
Baldoli, Ilaria (Scuola Superiore Sant'Anna, The BioRobotics Institute); Maselli, Martina* (Scuola Superiore Sant'Anna); Manti, Mariangela (Scuola Superiore Sant'Anna, Pisa, Italy); Surace, Elisabetta (Scuola Superiore Sant'Anna); Cianchetti, Matteo (Scuola Superiore Sant'Anna); Laschi, Cecilia (Scuola Superiore Sant'Anna)

15:05-15:20 SaCT4.4
Continuous Bladder Volume Monitoring System for Wearable Applications ........................................... 4435-4438
Shin, Seung-chul* (Yonsei Univ.); Moon, Junhyung (Yonsei Univ.); Kye, Saewon (Yonsei Univ.); Lee, Kyoungwoo (Yonsei Univ.); Lee, Yong Seung (Yonsei Univ.); Kang, Hong-Goo (Yonsei Univ.)

15:20-15:35 SaCT4.5
A Wearable 12-Lead ECG Acquisition System with Fabric Electrodes .................................................. 4439-4442
Zhang, Haoshi (Shenzhen Institutes of Advanced Technology); Tian, Lan (Shenzhen Institutes of Advanced Technology, Chinese Academy of); Lu, Huiyang (School of Data and Computer Science, Sun Yat-sen University); Zhou, Ming (School of Control science and Engineering, Shandong University); Zou, Haiqing (Shenzhen Yingda Strong Technology Co.); Fang, Peng* (Shenzhen Institutes of Advanced Technology, Chinese Academy of S); Yao, Fuan (School of Control Science and Engineering, Shandong University); Li, Guanglin (Shenzhen Institutes of Advanced Technology)

14:20-14:35 SaCT5.1
A Wearable Hand Gesture Recognition Device based on Acoustic Measurements at Wrist .................. 4443-4446
Siddiqui, Nabeel (City University of Hong Kong); Chan, Rosa H. M.* (City University of Hong Kong)
Novel Force-Sensing System for Minimally Invasive Surgical Instruments

Wee, Justin W.* (Univ. of Toronto, Hospital for Sick Children, CIGITI); Gerstle, J. Ted (Univ. of Toronto, Hospital for Sick Children, CIGITI); Francis, Peter (Univ. of Toronto); Drake, James (Univ. of Toronto, CIGITI, Hospital for Sick Children); Looi, Thomas (CIGITI, Hospital for Sick Children); Brooks, Robert Joseph (Hostpial for Sick Children, Univ. of Toronto); Kang, Matthew (Univ. of Toronto); Azzie, Georges (The Hospital for Sick Children); Masotti, Leigh (CIGITI, The Hospital for Sick Children); Villavicencio, Daniel (EiE)

Office Activity Classification using First-Reflection Ultrasonic Echolocation

Griffith, Henry* (Michigan State University); Biswas, Subir (Michigan State University); Hajiaghajani, Faezeh (Michigan State University)

A Wearable Ultrasonic Sensor Network for Analysis of Bilateral Gait Symmetry

Karalikkadan, Ashhar* (Nanyang Technological University); Soh, Cheong Boon (Nanyang Technological University); Kong, Keng He (Tan Tock Seng Hospital)

Monitoring Smoking Behaviour using a Wearable Acoustic Sensor

Torres, Iñigo (Imperial College London); Imtiaz, Syed Anas (Imperial College London); Peng, Mingxu* (Imperial College London); Rodriguez-Villegas, Esther (Imperial College London)

Propofol-Induced Sedation Diminishes the Strength of Frontal-Parietal-Occipital EEG Network

Rathee, Dheeraj* (Ulster University); Cecotti, Hubert (University of Ulster); Prasad, Girijesh (University of Ulster)

Single-Trial Detection of Event-Related Fields in MEG from the Presentation of Happy Faces: Results of the Biomag 2016 Data Challenge

Cecotti, Hubert* (University of Ulster); Barachant, Alexandre (Independent Researcher); King, Jean Remi (New York University); Sanchez Bormot, Jose Migueal (Ulster University); Prasad, Girijesh (University of Ulster)

Emergence of Metastable Dynamics in Functional Brain Organization via Spontaneous fMRI Signal and Whole-Brain Computational Modeling

Lee, Won Hee* (Icahn School of Medicine at Mount Sinai); Frangou, Sophia (Icahn School of Medicine at Mount Sinai)

Why Build an Integrated EEG-NIRS? About the Advantages of Hybrid Bio-Acquisition Hardware

von Lühmann, Alexander* (Machine Learning Dept. and Neurotechnology, Technische Univ); Müller, Klaus-Robert (Berlin Institute of Technology)

Sensorimotor Network Parcellation for Pre-Surgical Patients using Low-Pass Filtered fMRI

Han, Hao (Tsinghua University); Yan, Yuxiang (Tsinghua University); Zhou, WenJing (Tsinghua University); Hong, Bo* (Tsinghua University)

An Eye Tracking Index for the Salience Estimation in Visual Stimuli

Babiloni, Fabio* (University of Rome); Cartocci, Giulia (University of Rome Sapienza); Modica, Enrica (University of Rome Sapienza); Maglione, Anton Giulio (University of Rome Sapienza); Di Flumeri, Gianluca (University of Rome Sapienza)
The External Force Associated with Callus Formation under the First Metatarsal Head is Reduced by Wearing Rocker Sole Shoes .......................................................... 4487-4490
Amemiya, Ayumi* (Chiba University); Okonogi, Rena (Dept. of Nursing Physiology, Graduate School of Nursing, Ch); Yamakawa, Hiroki (Nature’s Walk Ltd); Susumu, Kaori (Dept. of Nursing Physiology, Graduate School of Nursing, Ch); Jitsushi, Tatsuya (Dept. of Nursing Physiology, Graduate School of Nursing, Ch); Sugawara, Hisayoshi (Graduate School of Nursing, Chiba University); L. Tanaka, Yuji (Dept. of Nursing Physiology, Graduate School of Nursing, Ch); Komiyama, Masatoshi (Dept. of Nursing Physiology, Graduate School of Nursing, Ch); Mori, Taketoshi (The University of Tokyo)

Manipulating the Fidelity of Lower Extremity Visual Feedback to Identify Obstacle Negotiation Strategies in Immersive Virtual Reality .................................................. 4491-4494
Kim, Aram* (University of Southern California); Zhou, Zixuan (University of Southern California); Kretch, Kari (University of Southern California); Finley, James (University of Southern California)

Prediction of Microsleeps using Pairwise Joint Entropy and Mutual Information between EEG Channels .......................................................... 4495-4498
Burro, Abdul Baseer* (University of Canterbury); Jones, Richard D. (New Zealand Brain Research Institute); Weddell, Stephen J. (University of Canterbury)

Ankle-Foot Orthosis using Elastomer-Embedded Flexible Joint .......................................................... 4499-4502
Abe, Isao* (Oita Univ.); Ishiya, Koheii (Oita Univ.); Kikuchi, Takehito (Oita Univ.); Tanida, Sousuke (Bukkyo Univ.); Yasuda, Takashi (Shiga School of Medical Technology); Taiki, Oshimoto, Taiki (Oita Univ.)

A Modified D-Max Method to Estimate Heart Rate at a Ventilatory Threshold during an Incremental Exercise Test .......................................................... 4503-4506
Jang, Dae-Geun* (Samsung Advanced Institute of Technology); Ko, Byung-Hoon (Samsung Advanced Institute of Technology); Sunoo, Sub (Kyung Hee University); Nam, Sang-Seok (KyungHee Univ.); Park, Hun-Young (Kyunghee University); Bae, Sang Kon (Samsung Advanced Inst of Tech)

Unified Health Gamification can Significantly Improve Well-Being in Corporate Environments .......................................................... 4507-4511
Shahrestani, Arash (Eindhoven University of Technology); Van Gorp, Pieter* (Eindhoven University of Technology); Le Blanc, Pascale (Eindhoven University of Technology); Greidanus, Fabrizio (ZuidZorg); de Groot, Kristel (GGzE); Leermakers, Jelle (Finaps)

Automatic Diagnosis of Tuberculosis Disease based on Plasmonic ELISA and Color-Based Image Classification .......................................................... 4512-4515
AbuHassan, Kamal* (Anglia Ruskin University (Chelmsford Campus)); Bakhori, Noremylia M. (Universiti Putra Malaysia); Kusnini, Norzila (Universiti Putra Malaysia); Azmi, Umi Zulaikha Mohd (Universiti Putra Malaysia); Hoque Tania, Marzia (Anglia Ruskin University); Evans, Benjamin (University of East Anglia); Binti Yusof, Nor Azah (Universiti Putra Malaysia); Hossain, M Alamgir (Anglia Ruskin University)

Novel Features from Autocorrelation and Spectrum to Classify Phonocardiogram Quality .......................................................... 4516-4520
Das, Deepan* (TATA Consultancy Services); Banerjee, Rohan (Tata Consultancy Services Ltd.); Dutta Choudhury, Anirban (Tata Consultancy Services Ltd.); Bhattacharya, Sakyajit (TCS Innovation Labs); Deshpande, Parijat (TCS); Pal, Arpan (Tata Consultancy Services); Mandana, K M (Fortis Hospitals, Kolkata)

Detection of Chewing Motion in the Elderly using a Glasses Mounted Accelerometer in a Real-Life Environment .......................................................... 4521-4524
Mertes, Gert* (KU Leuven); Hallez, Hans (KU Leuven); Vanrumste, Bart (Katholieke Universiteit Leuven); Croonenborghs, Tom (KU Leuven Campus Geel, AdvISe Technology Lab, Belgium)
**SaCT12: 14:20-15:50**  
**Geddes Room**  
**Ablation Technologies** (Oral Session)  
**Chair:** Prakash, Punit *(Kansas State University)*  

14:20-14:35  
**SaCT12.1**  
**Development of Evaluation Methods for the Approval and Review of Intense Pulsed Light (IPL)**  
Lee, Seung-Youl* (Ministry of Food and Drug Safety); Ju, Cho-Long (Ministry of Food and Drug Safety); Lee, Tae-Hee (Ministry of Food and Drug Safety); Na, Hyeon-su (Ministry of Food and Drug Safety); Lee, In-Su (Ministry of Food and Drug Safety); Park, Chang Won (Natl. Inst. of Food and Drug Safety Evaluation, Ministry)  

14:35-14:50  
**SaCT12.2**  
**Tapered Fiber Optic Applicator for Laser Ablation: Theoretical and Experimental Assessment of Thermal Effects on Ex Vivo Model**  
Saccomandi, Paola* *(University Campus Bio-Medico of Rome)*; Di Matteo, Francesco Maria *(University Campus Bio-Medico of Rome)*; Schena, Emiliano *(University of Rome Campus Bio-Medico)*; Quero, Giuseppe *(IHU-Strasbourg)*; Massaroni, Carlo *(Università Campus Bio-Medico di Roma)*; Giurazza, Francesco *(Università Campus Bio-Medico di Roma)*; Costamagna, Guido *(Unit of Digestive Endoscopy, Università Cattolica del Sacro Cuor)*; Silvestri, Sergio *(Università Campus Bio-Medico di Roma)*  

14:50-15:05  
**SaCT12.3**  
**Effects of Nd:YAG Laser for the Controlled and Localized Treatment of Early Gastrointestinal Tumors: Preliminary in Vivo Study**  
Saccomandi, Paola* *(University Campus Bio-Medico of Rome)*; Quero, Giuseppe *(IHU-Strasbourg)*; Costamagna, Guido *(Unit of Digestive Endoscopy, Università Cattolica del Sacro Cuor)*; Diana, Michele *(IRCAD: Research Institute against Cancer of Digestive System, St)*; Marescaux, Jacques *(IRCAD)*  

15:05-15:20  
**SaCT12.4**  
**Surface Modifications of Human Tooth using Nd: YAG Laser for Dental Applications**  
Mohamad Suhaimi, Fatanah* *(Advanced Medical and Dental Institute, University Sains Malaysia)*; Zainol Alam, Nurzarifha *(University Sains Malaysia)*; Mat Ariffin, Suriani *(University Sains Malaysia)*; Abdul Razak, Mohammad Khairul Azhar *(University Malaysia Kelantan)*  

15:20-15:35  
**SaCT12.5**  
**A Novel Sensor for Measuring Temperature Profile during the Thermoablation**  
Bujnowski, Adam *(Gdansk University of Technology)*; Wtorek, Jerzy* *(Gdansk University of Technology)*  

15:35-15:50  
**SaCT12.6**  
**Preliminary Study on Low Intensity Focused Ultrasound System for Neuromodulation**  
Lee, Ju Hyung *(Yonsei Univ.)*; Hong, Hyun Ki *(Catholic Kwandong Univ. International St. Mary's Hospital)*; Song, Byeong-Wook *(EIT/LOFUS R&D Center, Institute for Integrative Medicine, Cathol)*; Jung, Yu jin *(EIT/LOFUS R&D Center, Institute for Integrative Medicine, Colleg)*; Na, YoungCheol *(Catholic Kwandong Univ. Internationa St Mary's Hospital)*; Kim, Nam Hyun *(Yonsei Univ.)*; Kim, Bong-Soo* *(Catholic Kwandong Univ.)*

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**SaCT13: 14:20-15:50**  
**Dunn Room**  
**Sensor Informatics – Physiological Monitoring I** (Oral Session)  
**Chair:** Baranoski, Gladimir Valerio Guimaraes *(University of Waterloo)*  

14:20-14:35  
**SaCT13.1**  
**Differential Effects of Physical and Psychological Stressors on Electrodermal Activity**  

14:35-14:50  
**SaCT13.2**  
**An Autonomous Medical Monitoring System: Validation on Arrhythmia Detection**  
Lemkaddem, Alia* *(CSEM)*; Proença, Martin *(Swiss Center for Electronics and Microtechnology (CSEM))*; Delgado-Gonzalo, Ricardo *(CSEM)*; Renevey, Philippe *(CSEM)*; Oei, Ing *(Airbus Defence and Space GmbH)*; Montano, Giuseppe *(Airbus Defence and Space Limited)*; Martinez-Heras, Jose Antonio *(European Space Operations Centre (ESOC))*; Donati, Alessandro *(European Space Operations Centre (ESOC))*; Bertschi, Mattia *(CSEM)*; Lemay, Mathieu *(CSEM)*
Virtual Proprioception for Eccentric Training

LeMoyne, Robert* (Northern Arizona University); Mastroianni, Timothy (Independent)

Motion-Oriented Noisy Physiological Signal Refining using Embedded Sensing Platforms

Park, JaeYeon (Ajou University); Nam, Woohin (Ajou University); Kim, Tae Young (Ajou University School of Medicine); Lee, Sukhoon (Ajou University School of Medicine); Yoon, Dukyong (Ajou University School of Medicine); Ko, JeongGil* (Ajou University)

Detection of Generalized Tonic-Clonic Seizures using Short Length Accelerometry Signal

Kusmakar, Shitanshu* (The University of Melbourne); Karmakar, Chandan (Deakin University); Yan, Bernard (The Royal Melbourne Hospital); O'Brien, Terence (The Royal Melbourne Hospital); Muthuganapathy, Ramanathan (Indian Institute of Technology Madras); Palaniswami, Marimuthu (The University of Melbourne)

Three-Wavelength Method for the Optical Differentiation of Methemoglobin and Sulfhemoglobin in Oxygenated Blood

Van Leeuwen, Spencer Richard* (University of Waterloo); Baranoski, Gladimir Valerie Guimaraes (University of Waterloo); Kimmel, Bradley William (University of Waterloo)

Feature Extraction Techniques for Low-Power Ambulatory Wheeze Detection Wearables

Acharya, Jyotibdha* (Nanyang Technological University); Basu, Arindam (Nanyang Technological University); Ser, Wee (Nanyang Technological University)

Cough Sound Analysis for Diagnosing Croup in Pediatric Patients using Biologically Inspired Features

Sharan, Roneel V* (University of Queensland); Abeyratne, Udantha R (University of Queensland); Swarnkar, Vinayak (University of Queensland)

A Robust Dataset-Agnostic Heart Disease Classifier from Phonocardiogram

Banerjee, Rohan (Tata Consultancy Services Ltd.); Dutta Choudhury, Anirban* (Tata Consultancy Services Ltd.); Deshpande, Parijat (TCS); Bhattacharya, Sakyajit (TCS Innovation Labs); Pal, Arpan (Tata Consultancy Services); Mandana, K M (Fortis Hospitals, Kolkata)

Identification of Chronic Heart Failure using Linear and Nonlinear Analysis of Heart Sound

Zheng, Yineng (Chongqing University); Guo, Xingming* (Chongqing University)

Evaluating the use of Neural Networks and Acoustic Measurements to Identify Laryngeal Pathologies

Sodré, Bruno (UTFPR); Rosa, Marcelo* (Universidade Tecnológica Federal do Paraná); Dassie-Leite, Ana Paula (Universidade Estadual do Centro-Oeste - UNICENTRO)

Automated Lung Sound Analysis for Detecting Pulmonary Abnormalities

Datta, Shreyasi* (Tata Consultancy Srvs); Dutta Choudhury, Anirban (Tata Consultancy Srvs Ltd.); Deshpande, Parijat (TCS); Bhattacharya, Sakyajit (TCS Innovation Labs); Pal, Arpan (Tata Consultancy Srvs)