Program in Chronological Order

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* Author Name – Corresponding Author ● * Following Paper Title – Paper not Available

Thursday, 3 September 2009

ThPL1: 08:30-09:30 — Grand Ballroom - Salon D
Opening Ceremony & Plenary Lecture I
Chair: Bin He, *Univ. of Minnesota*

08:30-09:30 — ThPL1.1
MR Imaging of Brain Function: Challenges, Opportunities and Questions ..... *
Glover, Gary H. (Stanford University)*

ThKN1L: 09:40-11:10 — Grand Ballroom - Salon A
Theme Keynote I
Chair: Nitish Thakor, *Johns Hopkins Univ.*
Co-Chair: Dominique Durand, *Case Western Res. Univ.*

09:40-10:25 — ThKN1L.1
Useful Signals from Motor Cortex ..... *
Schwartz, Andrew (University of Pittsburgh)*

10:25-11:10 — ThKN1L.2
Toward Cognitive NeuroProsthesis ..... *
Principe, Jose (University of Florida)*

ThA01: 09:40-11:10 — Conrad B
1.1.1 Time-Frequency and Time-Scale Analysis I (Oral Session)
Chair: Sergio Cerutti, *Pol. di Milano*

09:40-09:55 — ThA01.1
Time-Varying Spectrum Estimation of Heart Rate Variability Signals with Kalman Smoother Algorithm 1-4
Tarvainen, Mika (University of Kuopio); Georgiadis, Stefanos (University of Kuopio); Lipponen, Jukka (University of Kuopio); Hakkarainen, Marko Juhani Filemon (University of Kuopio); Karjalainen, A (University of Kuopio)*

09:55-10:10 — ThA01.2
Analysis and Processing of Heart Rate Variability by Time-Frequency Representation: Quantification of the Pedaling Frequency Modulation 5-8
Meste, Olivier (UNSA-CNRS); Blain, Gregory (Uniuversity of Nice Sophia Antipolis); Bermon, Stephane (Inst. IM2S)*

10:10-10:25 — ThA01.3
Sleep Staging Classification Based on HRV: Time-Variant Analysis 9-12
Mendez, Martin Oswaldo (politecnico di Milano); Matteucci, Matteo (Politecnico di Milano); Cerutti, Sergio (Politecnico di Milano); Aletti, Federico (Politecnico di Milano); Bianchi, Anna Maria (Politecnico di Milano)*

10:25-10:40 — ThA01.4
New Approach in Features Extraction for EEG Signal Detection 13-16
Guerrero-Mosquera, Carlos (Universidad Carlos III de Madrid); Navia Vazquez, Ángel (University Carlos III of Madrid)*

10:40-10:55 — ThA01.5
A Semi-Automated Method for Epileptiform Transient Detection in the EEG of the Fetal Sheep Using Time-Frequency Analysis 17-20
Walbran, Anita Charlotte (The University of Auckland); Unsworth, Charles Peter (University of Auckland); Gunn, Alistair Jan (University of Auckland); Bennet, Laura (The University of Auckland)*

ThA02: 09:40-11:10 Conrad C
1.4.1 Biomedical Signal Pattern Classification (Oral Session)
Chair: Dimitrios I. Fotiadis, *Univ. of Ioannina*
Co-Chair: Jacques Duchêne, *UTT*

ThA03: 09:40-11:10 Grand Ballroom - Salon B
2.1.1 Minisymposium: Medical Imaging – New Biomarkers and Clinical Perspective I
Chair: Yi Wang, *Cornell Univ.*

ThA04: 09:40-11:10 Duluth Room
2.5.1 E/MEG Source Imaging (Oral Session)
Chair: Xiaoxiao Bai, *Yale Univ.*
Co-Chair: Barry Van Veen, *Univ. of Wisconsin*

09:40-09:55 ThA04.1
The Study of Brain Activity During the Observation of Commercial Advertising by Using High Resolution EEG Techniques **57-60**
Babiloni, Fabio (University of Rome); Astolfi, Laura (University of Rome); Vecchiato, Giovanni (University of Rome Sapienza)*

09:55-10:10 ThA04.2
State-Space Multivariate Autoregressive Models for Estimation of Cortical Connectivity from EEG **61-64**
Cheung, Bing Leung Patrick (University of Wisconsin); Riedner, Brady (University of Wisconsin); Tononi, Giulio (University of Wisconsin); Van Veen, Barry (University of Wisconsin)*

10:10-10:25 ThA04.3
Accurate Reconstruction of Brain Activity and Functional Connectivity from Noisy MEG Data **65-68**
Owen, Julia (UCSF); WIPF, David (UCSF); Attias, Hagai Thomas (Golden Metallic Inc.); Sekihara, Kensuke (Tokyo Metropolitan University); Nagarajan, Srikantan S. (University of California, San Francisco)*

10:25-10:40 ThA04.4
Solving of L0 Norm Constrained EEG Inverse Problem **69-72**
Xu, Peng (Univ of Electr Science and Tech of China); Lei, Xu (University of Electronic Science and Technology of China); Hu, Xiao (University of California, Los Angeles); Yao, Dezhong (University of Electronic Science and Technology of China)*

10:40-10:55 ThA04.5
High-Resolution Cortical Dipole Layer Imaging Based on Noise Covariance Matrix **73-76**
Hori, Junichi (Niigata University)*

10:55-11:10 ThA04.6
Dynamic Solution to the EEG Source Localization Problem Using Kalman Filters and Particle Filters **77-80**
minguez, javier (Zaragoza University); Antelis, Javier M. (University of Zaragoza)*

ThA05: 09:40-11:10 Marquette V
2.7.5 Biomedical Image Registration (Oral Session)
Chair: Christian Roux, *TELECOM Bretagne - INSERM*
Co-Chair: Metin Gurcan, *The Ohio State Univ.*

09:40-09:55 ThA05.1
Registration of Prone and Supine Ct Colonography Scans Based on Correlation Optimized Warping and Canonical Correlation Analysis **81-84**
Wang, Shijun (National Institutes of Health); Yao, Jianhua (National Institutes of Health); Liu, Jiamin (NIH); Petrick, Nicholas (U.S. Food and Drug Administration); Summers, Ronald (National Institutes of Health)*

09:55-10:10 ThA05.2
Quantitative Comparison of High-Resolution MRI and Myelin-Stained Histology of the Human Cerebral Cortex **85-89**
Osechinskiy, Sergey (University of California, Irvine); Kruggel, Frithjof (University of California, Irvine)*

10:10-10:25 ThA05.3
Registration of Low Dose Bi-Planar Acquisitions for Motion Analysis **90-93**
Jerbi, Taha (LaTIM, Telecom Bretagne); Burdin, Valérie (TELECOM Bretagne - INSERM U650); Stindel, Eric (Université de Bretagne Occidentale); Roux, Christian (TELECOM Bretagne - INSERM)*

ThA06: 09:40-11:10 Conrad A
3.2.1 Optical Sensors I (Oral Session)
Chair: Gang Yao, *Univ. of Missouri*
Co-Chair: Joseph Culver, *Washington Univ. School of Medicine*

ThA07: 09:40-11:10 Marquette VII

12.1.1 Recent Advances in Therapeutic Ultrasound (Oral Session)

Chair: Joo Ha Hwang, *Univ. of Washington*

Co-Chair: Gerald Ross Harris, *Food and Drug Administration*

ThA08: 09:40-11:10 Marquette VIII

11.3.1 Career Development in Biomedical Engineering (Oral Session)

Chair: Jie Zhang, *Medical School, Univ. of Minnesota*

Co-Chair: Semahat Demir, *National Science Foundation*

ThA09: 09:40-11:10 Marquette II

5.1.1 Cardiovascular Pulmonary Mechanics (Ventricular, Vascular, CFD) (Oral Session)

Chair: Paul Iaizzo, *Univ. of Minnesota*

Co-Chair: Frits Prinzen, *Cardiovascular Res. Inst. Maastricht*

ThA10: 09:40-11:10 Grand Ballroom - Salon C
6.3.2 Neural Prostheses II (Oral Session)
Chair: James Weiland, *Univ. of Southern California*
Co-Chair: Mark Humayun, *Univ. of Southern California*

ThA11: 09:40-11:10 Marquette I
6.13.1 Diagnostic & Evaluation Techniques for Neurological Disorders I (Oral Session)
Chair: William Zev Rymer, *Northwest. & Rehab Inst. of Chicago*
Co-Chair: Gert Cauwenberghs, *Univ. of California San Diego*

ThA12: 09:40-11:10 Marquette VI
7.5.1 Drug Delivery (Oral Session)
Chair: SuPing Lyu, *Medtronic, Inc.*
Co-Chair: Ronald A. Siegel, *Univ. of Minnesota*

ThA13: 09:40-11:10 Conrad D
8.3.1 Surgical Robotics (Oral Session)
Chair: Jacob Rosen, *Univ. of California - Santa Cruz*
Co-Chair: Philippe Poignet, *Univ. of Montpellier II*

ThA14: 09:40-11:10 Marquette III
9.1.4 Therapeutic Devices (Oral Session)
Chair: Fleur Tehrani, *California State Univ. Fullerton*
Co-Chair: Timm Gerry, *Univ. of Minnesota*

ThA15: 09:40-11:10 Marquette IX
10.1.3 Personal Health Systems, Body Sensor Networks (Oral Session)
Chair: Nikolaos Maglaveras, *Aristotle Univ. of Thessaloniki*
Co-Chair: Ilkka Korhonen, *VTT*

ThBPo02: 11:10-12:30 Grand Ballroom - Salon E, F, G
2.2.4 Biomedical Acoustic Imaging II (Poster Session)

ThBPo03: 11:10-12:30 Grand Ballroom - Salon E, F, G
6.4.4 Brain-Machine Interface III (Poster Session)

ThBPo04**:** 11:10-12:30 Grand Ballroom - Salon E, F, G
6.11.5 Biomedical Stimulation (Poster Session)

ThBPo05: 11:10-12:30 Grand Ballroom - Salon E, F, G
10.1.2 Wireless Technologies (Poster Session)

ThBPo07: 11:10-12:30 Grand Ballroom - Salon E, F, G
9.4.2 Medical Devices (Poster Session)

11:10-12:30 ThBPo07.33
Battery Power Comparison to Charge Medical Devices in Developing Countries **931-934**
Nimunkar, Amit (University of Wisconsin-Madison); Casanova, Alesia (University of Wisconsin Madison); Bray, Andrew (University of Wisconsin - Madison); Powers, Taylor (University of Wisconsin - Madison); Webster, John (University of Wisconsin Madison)*

11:10-12:30 ThBPo07.34
Multichannel Real Time Integrated Active Noise Control System for Infant Incubators **935-938**
Liu, Lichuan (Northern Illinois University); Kuo, Sen M. (Northern Illinois University)*

11:10-12:30 ThBPo07.35
Enhancing Biomedical Design with Design Thinking **939-941**
Dorsa, Ed (Virginia Tech)*

11:10-12:30 ThBPo07.36
Estimation of Variability of Specific Absorption Rate with Physical Description of Children Exposed to Electromagnetic Field in the VHF Band **942-945**
Nagaoka, Tomoaki (National Institute Info & Comm Tech); Watanabe, Soichi (Nat'l Inst of Information & Comms Tech)*

ThC01: 13:30-15:00 Conrad B
1.1.2 Wavelet Analysis of Biosignals (Oral Session)
Chair: Hisashi Yoshida, *Kinki Univ.*
Co-Chair: Murtaza Ali, *Texas Inst.*

13:30-13:45 ThC01.1
Analysis of the QRS Complex for Apnea-Bradycardia Characterization in Preterm Infants **946-949**
Altuve, Miguel (Simon Bolivar University and University of Rennes 1 and INSERM U642); Carrault, Guy (Université de Rennes 1); Cruz, Julio (Simon Bolivar University); Beuchée, Alain (Centre Hospitalier Universitaire); Pladys, Patrick (Centre Hospitalier Universitaire); Hernández, Alfredo I (Univ. of Rennes 1 and INSERM U642)*

13:45-14:00 ThC01.2
Robust Beat Detector for Ambulatory Cardiac Monitoring **950-953**
Romero, Iñaki (IMEC); Grundlehner, Bernard (Holst Centre); Penders, Julien (Stichting IMEC Nederland)*

14:00-14:15 ThC01.3
A Wavelet Based Method for Steady-State Detection in Anesthesia **954-957**
Castro, Ana (IDMEC - Polo FEUP); Gomes de Almeida, Fernando (Faculdade de Engenharia da Universidade do Porto); Amorim, Pedro (Hospital Geral de Santo António); Nunes, Catarina S (King's College London)*

14:15-14:30 ThC01.4
Quantitative Analysis of Heart Sounds and Systolic Heart Murmurs Using Wavelet Transform and AR Modeling **958-961**
Ning, James (Dartmouth College); Atanasov, Nikolay (Trinity College); Ning, Taikang (Trinity College)*

14:30-14:45 ThC01.5
A Self-Paced BCI Using Stationary Wavelet Packets **962-965**
Faradji, Farhad (University of British Columbia); Ward, Rabab (University of British Columbia); Birch, Gary E. (University of British Columbia)*

ThC02: 13:30-15:00 Conrad C
1.4.2 Biomedical Signal Classification I (Oral Session)
Chair: Baikun Wan, *Tianjin Univ.*
Co-Chair: Arun Kumar, *Medtronic*

13:30-13:45 ThC02.1
Energy Based Evolving Mean Shift Algorithm for Neural Spike Classification **966-969**
Yang, Zhi (University of California, Santa Cruz); Zhao, Qi (University of California); Liu, Wentai (University of California, Santa Cruz)*

ThC03: 13:30-15:00 Grand Ballroom - Salon B
2.4.1 X-ray, CT, PET, and SPECT (Oral Session)
Chair: Mark Anastasio, *Illinois Inst. of Tech.*
Co-Chair: Emil Sidky, *Univ. of Chicago*

ThC07: 13:30-15:00 Marquette VII
3.9.1 Microfluidics (Oral Session)
Chair: Logan Liu, *Univ. of Illinois at Urbana-Champaign*
Co-Chair: Utkan Demirci, *Massachusetts Inst. of Tech.*

ThC08: 13:30-15:00 Marquette VIII
11.4.1 History of Biomedical Engineering (Oral Session)
Chair: Ron Leder, *Univ. Nacional Autonoma de Mexico*
Co-Chair: Willis J. Tompkins, *Univ. of Wisconsin - Madison*

ThC09: 13:30-15:00 Marquette II
5.5.1 Vascular Reactivity and Mechanics (Oral Session)
Chair: Craig J. Hartley, *Baylor College of Medicine*
Co-Chair: Paul Iaizzo, *Univ. of Minnesota*

ThC10: 13:30-15:00 — Grand Ballroom - Salon C
6.9.2 Neural Trauma (Oral Session)
Chair: Barclay Morrison, *Columbia Univ.*
Co-Chair: Michelle LaPlaca, *Georgia Inst. of Tech.*

13:30-13:45 — ThC10.1
Plasma Membrane Damage As a Marker of Neuronal Injury **1113-1116**
LaPlaca, Michelle (Georgia Institute of Technology)*

13:45-14:00 — ThC10.2
Shear Wave Propagation in Anisotropic Soft Tissues and Gels **1117-1122**
Namani, Ravi (Washington University in St. Louis); Bayly, Philip (Washington University in St. Louis)*

14:00-14:15 — ThC10.3
Every Newton Hertz: A Macro to Micro Approach Investigating Brain Injury **1123-1126**
Duma, Stefan (Virginia Tech - Wake Forest); Rowson, Steven (Virginia Tech - Wake Forest)*

14:15-14:30 — ThC10.4
Hypoxic-Ischemic Brain Injury in Neonatal Piglets with Different Histological Outcomes: An Amplitude-Integrated EEG Study **1127-1130**
Zhang, Dandan (Tsinghua University); Hathi, Manan (Infinite Biomedical Technologies); Yang, Zeng-Jin (Johns Hopkins School of Medicine); Ding, Haiyan (Tsinghua University); Koehler, Raymond (Johns Hopkins School of Medicine); Thakor, Nitish (Johns Hopkins University)*

14:30-14:45 — ThC10.5
Accelerated Detection of Intracranial Space-Occupying Lesions with CUDA Based on Statistical Texture Atlas in Brain HRCT **1131-1134**
Liu, Wei (University of Science and Technology of China); Feng, Huanqing (University of Science and Tech); Li, Chuanfu (University of Science and Technology of China); Huang, Yufeng (University of Science and Technology of China); Wu, Dehuang (University of Science and Technology of China); Tong, Tong (University of Science and Technology of China)*

14:45-15:00 — ThC10.6
Quantification of Functional Alterations after in Vitro Traumatic Brain Injury **1135-1138**
Yu, Zhe (Columbia University); Elkin, Benjamin (Columbia University); Morrison, Barclay (Columbia University)*

ThC11: 13:30-15:00 — Marquette I
6.10.4 Virtual Reality and Robotics in Rehabilitation (Oral Session)
Chair: Sergei Adamovich, *NJIT*
Co-Chair: Emily Keshner, *Temple University*

13:30-13:45 — ThC11.1
Remapping in the Ipsilesional Motor Cortex after VR-Based Training: A Pilot Fmri Study **1139-1142**
Tunik, Eugene (University of Medicine and Dentistry of New Jersey (UMDNJ)); Adamovich, Sergei (NJIT)*

13:45-14:00 — ThC11.2
Coordination Changes Demonstrated by Subjects with Hemiparesis Performing Hand–Arm Training Using the NJIT-RAVR Robotically Assisted Virtual Rehabilitation System **1143-1146**
Qiu, Qinyin (NJIT); Fluet, Gerard (UMDNJ); Lafond, Ian (New Jersey Institute of Technology); Merians, Alma (UMDNJ); Adamovich, Sergei (NJIT)*

14:00-14:15 — ThC11.3
Visual Field Dependence Influences Balance in Patients with Stroke **1147-1150**
Keshner, Emily (Temple University); Slaboda, Jill (Temple University); barton, joseph (TEMPLE UNIVERSITY); maitin, ian (TEMPLE UNIVERSITY)*

14:15-14:30 — ThC11.4
Therapist-Mediated Post-Stroke Rehabilitation Using Haptic/graphic Error Augmentation **1151-1156**
Rozario, Sylvester Vijay (U. of Illinois at Chicago, Rehabilitaiton Institute of Chicago); Housman, Sarah (Rehabilitation Institute of Chicago); Kovic, Mark (Rehabilitation Inst. Chicago); Patton, James (Jim) (Rehab Institute of Chicago & U. of Illinois at Chicago)*

14:45-15:00 ThC13.6
Wireless Steering Mechanism with Magnetic Actuation for an Endoscopic Capsule **1204-1207**
Menciassi, Arianna (Scuola Superiore Sant'Anna); Valdastri, Pietro (Scuola Superiore Sant'Anna); quaglia, claudio (Scuola superioriore sant'anna); Buselli, Elisa (Scuola Superiore Sant'Anna); Dario, Paolo (Scuola Superiore Sant'Anna)*

ThC14: 13:30-15:00 Marquette III
9.4.1 Continuous Monitoring Systems (Oral Session)
Chair: Alan Rosenbloom, *Carnegie Mellon Univ.*
Co-Chair: Abraham Lee, *Univ. of California, Irvine*

13:30-13:45 ThC14.1
Capacitive On-Line Hematocrit Sensor Design Based on Impedance Spectroscopy for Use in Hemodialysis Machines **1208-1211**
Trebbels, Dennis (HSG-IMIT); Zengerle, Roland (Microfluidics); Hradetzky, David (HSG-IMIT)*

13:45-14:00 ThC14.2
A Flexible Pressure Monitoring System for Pressure Ulcer Prevention **1212-1215**
Yip, Marcus (Massachusetts Institute of Technology); He, David Da (Massachusetts Institute of Technology); Winokur, Eric (Massachusetts Inst. of Tech.); Gaudreau Balderrama, Amanda (Massachusetts Institute of Technology); Sheridan, Robert (Shriner's Hospital for Children Boston); Ma, Hongshen (University of British Columbia)*

14:00-14:15 ThC14.3
The Exploration & Forensic Analysis of Computer Usage Data in the Elderly **1216-1219**
Hatt, William J (Oregon Health & Science University, Central Campus); VanBaak, Edward (Oregon Health & Science University); Jimison, Holly (Oregon Health & Science University); Hagler, Stuart (Oregon Health and Science University); Hayes, Tamara (Oregon Health and Science University); Pavel, Michael (Oregon Health and Science University); Kaye, Jeffrey A. (Oregon Health and Science University)*

14:15-14:30 ThC14.4
Towards a Mobility Diagnostic Tool: Tracking Rollator Users' Leg Pose with a Monocular Vision System **1220-1225**
Ng, Samantha (University of Waterloo); Fakih, Adel (University of Waterloo); Fourney, Adam (University of Waterloo); Poupart, Pascal (University of Waterloo); Zelek, John (University of Waterloo)*

14:30-14:45 ThC14.5
Influence of Gas Temperature on the Performances of a Low Dead Space Capillary Type Pneumotachograph for Neonatal Ventilation **1226-1229**
Schena, Emiliano (University of Rome Campus Bio-Medico); Silvestri, Sergio (University Campus Bio-Medico)*

14:45-15:00 ThC14.6
Microdialysis Coupled with an Embedded Systems Controller and CMOS Image Sensor **1230-1233**
Subrebost, George (Carnegie Mellon Univ.); Rosenbloom, Alan (Carnegie Mellon Univ.); Gandhi, Heer (Carnegie Mellon Univ.)*

ThC15: 13:30-15:00 Marquette IX
10.2.3 eHealth, mHealth, Telemedicine Systems (Oral Session)
Chair: Constantinos Pattichis, *Univ. of Cyprus*
Co-Chair: Sergio Guillen, *Inst. Itaca*

13:30-13:45 ThC15.1
The MyHealthService Approach for Chronic Disease Management Based on Free Open Source Software and Low Cost Components **1234-1237**
Vognild, Lars K. (Northern Research Institute Tromsø (Norut)); Burkow, Tatjana M. (University Hospital of North-Norway); Luque, Luis Fernandez (Northern Research Institute Tromsø (Norut))*

13:45-14:00 ThC15.2
Mobile Patient Monitoring: The MobiHealth System **1238-1241**
Wac, Katarzyna (University of Geneva)*

14:00-14:15 ThC15.3
Multi-parametric system for the continuous assessment and monitoring of motor status in Parkinson's disease: an entropy-based gait comparison **1242-1245**
Reynold, Greenlaw (Oxford Computer Consultants); Arredondo, María Teresa (Technical University of Madrid); Estrada, Juan Jacobo (Polytechnic University of Madrid); Pansera, Mario (Universidad Politecnica de Madrid); Fotiadis, Dimitrios I. (University of Ioannina)*

14:15-14:30 ThC15.4
An Overview of Recent Health Care Support Systems for Eemergency and Mhealth Applications **1246-1249**
Kyriacou, Efthyvoulos (Frederick University Cyprus); Pattichis, Constantinos (University of Cyprus); Pattichis, Marios (University of New Mexico,)*

14:30-14:45 ThC15.5
Portable Emergency Telemedicine System Over Wireless Broadband and 3G Networks **1250-1253**
Hong, SungHye (Yonsei University); Kim, SangYong (Yonsei University); Kim, Jungchae (Yonsei University); Lim, DongKyu (Yonsei University); Jung, Seok Myung (Yonsei University); Kim, DongKeun (Sangmyung University, Seoul, Korea); Yoo, Sun K. (Yonsei University Health System)*

14:45-15:00 ThC15.6
TraumaStation: A Portable Telemedicine Station **1254-1257**
Rizou, Despina (Fraunhofer Institute for Computer Graphics); SACHPAZIDIS, ILIAS (Fraunhofer Institute); Salvatore, Luca (MEDCOM); SAKAS, Georgios (Fraunhofer Institute for Computer Graphics)*

ThC16: 13:30-15:00 Grand Ballroom - Salon A
S 1. Medical Device and Healthcare Industry: Trends and Opportunities I (Special Symposium)
Chair: Bin He, *Univ. of Minnesota*
Co-Chair: Gregory A. Worrell, *Mayo Clinic*

13:30-14:00 ThC16.1
Navigating through the opportunities in Neuromodulation to assure a scientific and cost-effectiveness base for best patient care ..... *
Kuntz, Richard (Medtronic, Inc. and Medtronic Neuromodulation)

14:00-14:30 ThC16.2
Neuromodulation: Approaching the 'Tipping Point' ..... *
Chavez, Chris (St. Jude Medical Neuromodulation)

14:30-15:00 ThC16.3
Medical Devices and the Aaudacity of Hope in Healthcare ..... *
Smith, Joseph (Johnson & Johnson Science and Technology)

ThDPo01: 15:00-16:40 Grand Ballroom - Salon E, F, G
1.2.2 Biomedical Signals and Systems II (Poster Session)

15:00-16:40 ThDPo01.1
Comparison between Voxelized, Volumized and Analytical Phantoms Applied to Radiotherapy Simulation with Monte Carlo **1258-1261**
Abella, Vicente (Politechnical University of Valencia); Miró, Rafael (Polytechnic University of Valencia); Juste, Belen (Polytechnic University of Valencia); Verdu, Gumersindo (Polytechnic University of Valencia)*

15:00-16:40 ThDPo01.2
Mathematical Modeling of a Tethered Bilayer Sensor Containing Gramicidin A Ion Channels **1262-1265**
Monfared, Sahar (University of British Columbia); Krishnamurthy, Vikram (University of British Columbia)*

15:00-16:40 ThDPo01.3
Development of Statistical Regression Models for Ventilation Estimation **1266-1269**
Liu, Shaopeng (University of Connecticut); Gao, Robert X. (University of Massachusetts Amherst); He, Qingbo (University of Connecticut); Staudenmayer, John (University of Massachusetts, Amherst); Freedson, Patty (University of Massachusetts Amherst)*

ThDPo02: 15:00-16:40 Grand Ballroom - Salon E, F, G
2.3.4 Biomedical Optical Imaging II (Poster Session)

ThDPo03: 15:00-16:40 Grand Ballroom - Salon E, F, G
3.2.2 Optical Sensors II (Poster Session)

ThDPo04: 15:00-16:40 Grand Ballroom - Salon E, F, G
6.7.1 Neural Circuits and Mechanisms (Poster Session)

ThDPo05: 15:00-16:40 Grand Ballroom - Salon E, F, G
6.11.4 Rehabilitation II (Poster Session)

15:00-16:40 ThDPo05.6
Tremor Suppression Orthoses for Parkinson's Patients: A Frequency Range Perspective **1565-1568**
Rahimi, Fariborz (University of Waterloo); almeida, Quincy (Wilfrid Laurier University); Wang, David (University of Waterloo); Janabi-Sharifi, Farrokh (Ryerson University)*

15:00-16:40 ThDPo05.7
An FES Cycling Control System Based on CPG **1569-1572**
Hou, Zeng-Guang (Chinese Academy of Sciences); Li, Pengfeng (Institute of Automation, Chinese Academy of Sciences); Zhang, Feng (Chinese Academy of Sciences)*

15:00-16:40 ThDPo05.8
Design and Evaluation of a Hybrid Passive and Active Gravity Neutral Orthosis (GNO) **1573-1576**
Koo, Benjamin (Columbia University Medical Center); Montes, Jacqueline (Columbia University); Gamarnik, Viktor (Columbia University); Yeager, Keith (Columbia University); Marra, Jonathan (Columbia University); Dunaway, Sally (Columbia University Medical Center); Montgomery, Megan (Columbia University); De Vivo, Darryl (Columbia University); Strauss, Nancy E. (Columbia University); Konofagou, Elisa (Columbia University); Kaufmann, Petra (Columbia University); Morrison, Barclay (Columbia University)*

15:00-16:40 ThDPo05.9
Design and Analysis of Ultrasonic Monaural Audio Guiding Device for the Visually Impaired **1577-1580**
Kim, Keonwook (Dongguk University); Kim, Hyunjai (IESystems Co.); Yun, Gihun (Dongguk University); Kim, Myungsoo (Dongguk University)*

15:00-16:40 ThDPo05.10
The Effects of Asymmetric Tonic Neck Reflex During Reaching Movements Following Stroke: Preliminary Results **1581-1584**
Lee, Song Joo (Northwestern University); Yao, Jun (Northwestern University); Acosta, Anamaria (Northwestern University); Dewald, Julius P. A. (Northwestern University)*

15:00-16:40 ThDPo05.11
Electro-Tactile Preference Identification Using Fuzzy Logic **1585-1588**
Fadali, M. Sami (University of Nevada, Reno); Shen, Yantao (University of Nevada, Reno); Jafarzadeh, Saeed (University of Nevada, Reno); Yi, Jingang (Rutgers University)*

15:00-16:40 ThDPo05.12
Phantom Limb Pain Treated by Far Infrared Ray **1589-1591**
Huang, Chi-Yu (National Taiwan University); Yang, Rong-Sen (College of Medicine, National Taiwan University); Kuo, Te-son (Nation Taiwan University); Hsu, Kai-Hsiung (National Ilan University)*

ThDPo06: 15:00-16:40 Grand Ballroom - Salon E, F, G
6.2.3 Neural Microsystems III (Poster Session)

15:00-16:40 ThDPo06.1
Highly Programmable Digital Controller for High-Density Epi-Retinal Prosthesis **1592-1595**
Chen, Kuanfu (University of California, Santa Cruz); Liu, Wentai (University of California, Santa Cruz)*

15:00-16:40 ThDPo06.2
Comparing different electrode configurations using the 10-10 international system in tDCS: a finite element model analysis **1596-1599**
Faria, Paula Cristina (University of Lisbon); Leal, Alberto (AL); Miranda, Pedro (Faculty of Science, University of Lisbon)*

15:00-16:40 ThDPo06.3
A Flexible Microelectrode for Mouse EEG **1600-1603**
Choi, Jee Hyun (Korea Institute of ScienceandTechnology,UniversityofScience and Technology); Koch, Klaus-Peter (Fraunhofer Institut für Biomedizinische Technik); Poppendieck, Wigand (Fraunhofer Institut für Biomedizinische Technik); Lee, Mina (Korea Institute of Science andTechnology,UniversityofScience and Technology)*

15:00-16:40 ThDPo06.4
Common Median Referencing for Improved Action Potential Detection with Multielectrode Arrays **1604-1607**
Rolston, John (Emory University School of Medicine); Gross, Robert (Emory University); Potter, Steve (Georgia Institute of Technology)*

ThDPo07: 15:00-16:40 Grand Ballroom - Salon E, F, G
10.7.2 Healthcare Information Systems (Poster Session)

ThE01: 16:40-18:10 Conrad B
1.2.1 EEG Signal Processing I (Oral Session)
Chair: Reza Fazel-Rezai, *Univ. of North Dakota*
Co-Chair: Richard D. Jones, *Van der Veer Inst.*

ThE06: 16:40-18:10 Conrad A
3.1.1 Acoustic, Mechanical, and Thermal Sensors (Oral Session)
Chair: Stanislav Emelianov, *Univ. of Texas at Austin*
Co-Chair: Michael Kolios, *Ryerson Univ.*

ThE07: 16:40-18:10 Marquette VII
12.1.2 Recent Advances in Translational Biophotonics and Nanophotonic Imaging Technologies (Oral Session)
Chair: Ilko Ilev, *US FDA*
Co-Chair: Vadim Backman, *Northwestern Univ.*

ThE08: 16:40-18:10 Marquette VIII
11.2.1 Biomedical Engineering Education (Oral Session)
Chair: Jorge E. Monzon, *Univ. Nacional del Nordeste*
Co-Chair: Willis J. Tompkins, *Univ. of Wisconsin - Madison*

17:40-17:55 ThE08.4
Real-Time Development of Data Acquisition and Analysis Software for Hands-On Physiology Education in Neuroscience: G-PRIME **2019-2021**
Lott, Gus (Howard Hughes Medical Institute); Bonow, Robert (Cornell University); land, bruce (cornell univ); Johnson, Bruce (Cornell University)*

17:55-18:10 ThE08.5
Global Engineering Education Initiative through Student Organization **2022-2024**
Sagstetter, Ann (University of Wisconsin-Madison); Vitzthum, Lucas (University of Wisconsin); Meyer, Jonathan (University of Wisconsin-Madison); Nimunkar, Amit (University of Wisconsin-Madison); Webster, John (University of Wisconsin Madison)*

ThE09: 16:40-18:10 Marquette II
5.9.1 Heart-Brain Connections (Oral Session)
Chair: Kenji Sunagawa, *Kyushu University*
Co-Chair: Maneesh Shrivastav, *Medtronic / Univ. of Minnesota*

16:40-16:55 ThE09.1
Effects of Electrical Stimulation of the Carotid Sinus Baroreflex Using the Rheos® Device on Ventricular-Vascular Coupling and Myocardial Efficiency Assessed by Pressure-Volume Relations in Non-Vagotomized Anesthetized Dogs **2025-2029**
Georgakopoulos, Dimitrios (CVRx Inc.); Wagner, Darrell (CVRx Inc.); Cates, Adam (CVRx Inc.); Irwin, Eric (CVRx Inc); Lovett, Eric (CVRx)*

16:55-17:10 ThE09.2
Feedback Control of Multiple Hemodynamic Variables with Multiple Cardiovascular Drugs **2030-2032**
Sugimachi, Masaru (Natl Cardio Center Research Inst); UEMURA, KAZUNORI (National Cardio. Center Research Inst); Kamiya, Atsunori (National Cardiovascular Center Research Institute); Shimizu, Shuji (National Cardiovascular Center Research Institute); Shishido, Toshiaki (National Cardiovascular Center Research Institute)*

17:10-17:25 ThE09.3
Spinal Cord Stimulation for Complex Regional Pain Syndrome **2033-2036**
Shrivastav, Maneesh (Medtronic / University of Minnesota); Musley, Shailesh (Medtronic)*

17:25-17:40 ThE09.4
Chronic Vagal Stimulation in Patients with Congestive Heart Failure **2037-2039**
De Ferrari, Gaetano M. (Fondazione IRCCS Policlinico San Matteo); Sanzo, Antonio (Fondazione IRCCS Policlinico San Matteo and University of Pavia); Schwartz, Peter J. (Fondazione IRCCS Policlinico San Matteo and UniversityofPavia)*

17:40-17:55 ThE09.5
Mechanisms of Blood Pressure Reduction by Prolonged Activation of the Baroreflex **2040-2042**
Iliescu, Radu (University of Mississippi Medical Center); Lohmeier, Thomas E. (University of Mississippi Medical Center)*

17:55-18:10 ThE09.6
Bionic Autonomic Neuromodulation Revolutionizes Cardiology in the 21st Century **2043-2045**
Sunagawa, Kenji (Kyushu University)*

ThE10: 16:40-18:10 Grand Ballroom - Salon C
6.2.2 Neural Microsystems II (Oral Session)
Chair: Robert Butera, *Georgia Inst. of Tech.*
Co-Chair: Arthur Erdman, *Univ. of Minnesota*

16:40-16:55 ThE10.1
A Microelectrode Array Incorporating An Optical Waveguide Device for Stimulation and Spatiotemporal Electrical Recording of Neural Activity **2046-2049**
Zhang, Jiayi (Brown University); Laiwalla, Farah (Brown University); Kim, Jennifer (Brown University); URABE, HAYATO (Brown University); Van Wagenen, Rick (Blackrock Microsystems); Song, Yoon-Kyu (Brown University); Connors, Barry W (Brown University); Nurmikko, Arto (Brown University)*

ThE11: 16:40-18:10 Marquette I
6.12.1 Evoked Potentials (Oral Session)
Chair: Daniel J. Strauss, *Comp. Diagn. & Biocyb. Unit*
Co-Chair: Yukio Kosugi, *Tokyo Inst. of Tech.*

ThE12: 16:40-18:10 Marquette VI
7.1.1 Tissue Engineering (Oral Session)
Chair: Wei Shen, *Univ. of Minnesota*
Co-Chair: Michael Cho, *Univ. of Illinois*

16:40-16:55 ThE12.1
Controlling Cellular Biomechanics of Human Mesenchymal Stem Cells **2090-2093**
Titushkin, Igor (University of Illinois at Chicago); Cho, Michael (University of Illinois)*

16:55-17:10 ThE12.2
Tuning Hydrogel Properties for Applications in Tissue Engineering **2094-2096**
Burdick, Jason (University of Pennsylvania)*

17:10-17:25 ThE12.3
Device for the Control of Oxygen Concentration in Multiwell Cell Culture Plates **2097-2100**
Oppegard, Shawn (University of Illinois at Chicago); Eddington, David (University of Illinois at Chicago)*

17:25-17:40 ThE12.4
Designer Protein-Based Scaffolds for Neural Tissue Engineering **2101-2102**
Straley, Karin (Stanford University); Heilshorn, Sarah (Stanford University)*

17:40-17:55 ThE12.5
Temporal and Spatial Control Over Soluble Protein Signaling for Musculoskeletal Tissue Engineering **2103-2105**
Murphy, William (University of Wisconsin)*

17:55-18:10 ThE12.6
Upstream Mechanotaxis Behavior of Endothelial Cells **2106-2110**
Song, Sukhyun (Korea Advanced Institute of Science and Technology); Kim, Minah (Korea Advanced Institute of Science and Technology); Shin, Jennifer Hyunjong (KAIST)*

ThE13: 16:40-18:10 Conrad D
8.5.1 Interactive Control of Powered Lower Limb Prostheses (Oral Session)
Chair: Eric Perreault, *Northwestern Univ.*
Co-Chair: Daniel Ferris, *Univ. of Michigan*

16:40-16:55 ThE13.1
Toward the Development of a Neural Interface for Lower Limb Prosthesis Control **2111-2114**
Hargrove, Levi (Rehabilitation Institute of Chicago); Huang, He (University of Rhode Island); Schultz, Aimee (Rehabilitation Institute of Chicago); Lock, Blair (Rehabilitation Institute of Chicago); Lipschutz, Robert (Rehabilitation Institute of Chicago); Kuiken, Todd (Rehabilitation Institute of Chicago)*

16:55-17:10 ThE13.2
Control Strategy for Stabilizing Force with Goal-Equivalent Joint Torques Is Frequency-Dependent During Human Hopping **2115-2118**
Yen, Jasper (Georgia Institute of Technology); Chang, Young-Hui (Georgia Institute of Technology)*

17:10-17:25 ThE13.3
Robotic Lower Limb Exoskeletons Using Proportional Myoelectric Control **2119-2124**
Ferris, Daniel (University of Michigan); Lewis, Cara (University of Michigan)*

17:25-17:40 ThE13.4
Phase-Based Control of the Central Pattern Generator for Locomotion **2125-2128**
Vogelstein, R. Jacob (Johns Hopkins University); Etienne-Cummings, Ralph (Johns Hopkins University); Cohen, Avis (University of Maryland College Park)*

17:40-17:55 ThE13.5
Slacking by the Human Motor System: Computational Models and Implications for Robotic Orthoses **2129-2132**
Reinkensmeyer, David (University of California); Akoner, Mine (University of California at Irvine); Ferris, Daniel (University of Michigan); Gordon, Keith (Rehabilitation Institute of Chicago)*

ThE14: 16:40-18:10 Marquette III
9.1.1 Muscle and Nerve Stimulation (Oral Session)
Chair: George O'Clock, *Univ. of Minnesota*
Co-Chair: David Guiraud, *INRIA*

16:40-16:55 ThE14.1
Electrotherapeutic Device/Protocol Design Considerations for Visual Disease Applications 2133-2136
O'Clock, George (University of Minnesota); Jarding, John (Acuity Medical Inc.)*

16:55-17:10 ThE14.2
Neuro-Muscular Electrical Stimulation Training Enhances Maximal Aerobic Capacity in Healthy Physically Active Adults 2137-2140
Crognale, Domenico (University College Dublin); Crowe, Louis (University College Dublin); devito, giuseppe (University College Dublin); Minogue, Conor M (Biomedical Research Ltd); Caulfield, Brian (UCD)*

17:10-17:25 ThE14.3
Low Intensity Pulsed Ultrasound Increases the Mechanical Properties of the Healing Tissues at Bone-Tendon Junction 2141-2144
Lu, Tracy Minhua (Shenzhen University); Zheng, Yongping (The Hong Kong Polytechnic University); Huang, Qinghua (South China University of Technology); Lu, Hong Bin (The Chinese University of Hong Kong); Qin, Ling (The Chinese University of Hong Kong)*

17:25-17:40 ThE14.4
Development of a Multi – Electrode Electrical Stimulation Device to Improve Chronic Wound Healing 2145-2148
Weber, Sonja (University of Ulster); Vonhoff, Philipp Alexis (University of Ulster); Owens, Frank (University of Ulster); Byrne, John Anthony (University of Ulster); McAdams, Eric (University of Ulster)*

17:40-17:55 ThE14.5
A Hemodynamic Study of Popliteal Vein Blood Flow: The Effect of Bed Rest and Electrically Elicited Calf Muscle Contractions 2149-2152
Broderick, Barry (National University of Ireland Galway); O'Briain, David E. (Department of Surgery, National University of Ireland, Galway, University Road, Galway, Ireland and Galway University Hospitals,); Breen, Paul (National University of Ireland Galway); Kearns, Stephen R. (National University of Ireland, Galway, University Road, Galway, Ireland and Galway University Hospitals, Galway, Ireland.); OLaighin, Gearoid (National University of Ireland Galway)*

17:55-18:10 ThE14.6
Design and Analysis of a Transcutaneous Telemetry Device for Brain Stimulator 2153-2156
Wang, Weiming (Tsinghua University); Hao, Hongwei (Tsinghua University); Ma, Bozhi (Tsinghua University); Liu, FangJun (Tsinghua University); Hu, Chunhua (Tsinghua University); Li, Luming (Tsinghua University)*

ThE15: 16:40-18:10 Marquette IX
10.3.1 Enterprise-Wide Image Management (Oral Session)
Chair: Seong Mun, *Virginia Tech.*
Co-Chair: Elliot B. Sloane, *CHIRP*

16:40-16:55 ThE15.1
Potential Impact of HITECH Security Regulations on Medical Imaging 2157-2160
Prior, Fred (Washington University School of Medicine); Ingeholm, Mary Lou (Georgetown University); Levine, Betty (Georgetown University); Tarbox, Lawrence (Washington University in St. Louis, School of Medicine)*

16:55-17:10 ThE15.2
Conversion to Use of Digital Chest Images for Surveillance of Coal Workers' Pneumoconiosis (Black Lung) 2161-2163
Levine, Betty (Georgetown University); Ingeholm, Mary Lou (Georgetown University); Prior, Fred (Washington University School of Medicine); Mun, Seong (Virginia Tech); Freedman, Matthew Thomas (Georgetown University Medical Center); Weissman, David (National Institute for Occupational Safety and Health); Attfield, Michael (National Institute for Occupational Safety and Health Mailing); Wolfe, Anita (NIOSH); Petsonk, Edward (West Virginia University School of Medicine)*

ThE16: 16:40-18:10 Grand Ballroom - Salon A
S 1. Medical Device and Healthcare Industry: Trends and Opportunities II (Special Symposium)
Chair: Robert Tranquillo, *Univ. of Minnesota*
Co-Chair: Bin He, *Univ. of Minnesota*

ThE18: 16:40-18:10 Marquette IV
1.2.7 Neural Signal Processing (Oral Session)
Chair: Nitish Thakor, *Johns Hopkins Univ.*
Co-Chair: Justin Dauwels, *MIT*

17:25-17:40 ThE18.4
Scaling Exponents of EEG Are Related to the Temporal Process of the Therapeutic Hypothermia Following Ischemic Brain Injury **2192-2195**
Jiang, Dineng (Shanghai Jiao Tong University); Wu, Wenqing (Shanghai Jiao Tong University); Jia, Xiaofeng (Johns Hopkins School of Medicine); Qiu, Yihong (Shanghai Jiao Tong University); Zhu, Yisheng (Shanghai Jiaotong University); Thakor, Nitish (Johns Hopkins University); Tong, Shanbao (Shanghai Jiao Tong University)*

17:40-17:55 ThE18.5
Long-Term Assessment of Post-Cardiac-Arrest Neurological Outcomes with Somatosensory Evoked Potential in Rats **2196-2199**
Kang, Xiaoxu (Johns Hopkins University); Koenig, Matthew (Johns Hopkins School of Medicine); Xiong, Wei (Johns Hopkins University); Puttgen, Hans Adrian (Johns Hopkins University); Jia, Xiaofeng (Johns Hopkins School of Medicine); Geocadin, Romergryko (Johns Hopkins University); Thakor, Nitish (Johns Hopkins University)*

17:55-18:10 ThE18.6
Automatic Recognition of Postures and Activities in Stroke Patients **2200-2203**
Sazonov, Edward (Clarkson University); Fulk, George (Clarkson University); Sazonova, Nadezhda (Clarkson University); Schuckers, Stephanie (Clarkson University)*

ThBPL1: 19:40-20:10 Grand Ballroom
Plenary Lecture II
Chair: Bin He, *Univ. of Minnesota*

19:40-20:10 ThBPL1.1
The History of Short-Term and Long-Term Pacing ..... *
Bakken, Earl (Medtronic, Inc.)*

Friday, 4 September 2009

FrPL1: 08:30-09:30 Grand Ballroom - Salon D
Conference Keynote Lecture
Chair: Yongmin Kim, *Univ. of Washington*

08:30-09:30 FrPL1.1
Use of New Nanotechnology-based DNA Sequencing Technologies to Illuminate Cellular Regulation and Defense ..... *
Fire, Andrew Zachary (Stanford University School of Medicine)*

FrKN2L: 09:40-11:10 Grand Ballroom - Salon A
Theme Keynote II
Chair: Xiaochuan Pan, *Univ. of Chicago*

09:40-10:25 FrKN2L.1
Imaging and Optical Biopsy Using Optical Coherence Tomography ..... *
Fujimoto, James G. (Massachusetts Institute of Technology)*

10:25-11:10 FrKN2L.2
Photoacoustic Tomography: High-resolution in vivo Imaging of Optical Contrast at New Depths ..... *
Wang, Lihong (Washington University in St. Louis)*

FrA01: 09:40-11:10 Conrad B
1.8.1 Coupling and Synchronizations (Oral Session)
Chair: Shangkai Gao, *Tsinghua Univ.*
Co-Chair: Fabio Babiloni, *Univ. of Rome*

09:40-09:55 FrA01.1
Analysis of the Connection Redundancy in Functional Networks from High-Resolution EEG: A Preliminary Study **2204-2207**
Babiloni, Fabio (University of Rome); De Vico Fallani, Fabrizio (Universita' La Sapienza); Astolfi, Laura (University of Rome); Vecchiato, Giovanni (University of Rome Sapienza); Salinari, Serenella (La Sapienza University); Mattia, Donatella (Fondazione Santa Lucia IRCCS)*

FrA02: 09:40-11:10 Conrad C
1.4.6 Biomedical Signal Classification V (Oral Session)
Chair: Olivier Meste, *UNSA-CNRS*

10:55-11:10 FrA02.6

Complexity Analysis of Pathological Voices by Means of Hidden Markov Entropy Measurements **2248-2251**

Arias-Londoño, Julián David (Universidad Nacional de Colombia sede Manizales); Godino-Llorente, Juan Ignacio (Universidad Politécnica de Madrid); Castellanos-Dominguez, Germán (Universidad Nacional de Colombia); Sáenz-Lechón, Nicolás (Universidad Politécnica de Madrid); Osma-Ruíz, Víctor (Universidad Politécnica de Madrid)*

FrA03: 09:40-11:10 — Grand Ballroom - Salon B

2.2.1 Biomedical Acoustic Imaging I (Oral Session)

Chair: Emad Ebbini, *Univ. of Minnesota*

09:40-09:55 FrA03.1

Liver Elasticity and Viscosity Quantification Using Shearwave Dispersion Ultrasound Vibrometry (SDUV) **2252-2255**

Chen, Shigao (Mayo Clinic College of Medicine); Urban, Matthew (Mayo Clinic College of Medicine); pislaru, Cristina (Mayo Clinic College of Medicine); Kinnick, Randy (Mayo Clinic); Greenleaf, James (Mayo Clinic)*

09:55-10:10 FrA03.2

A Reduced Multiplier Beamformer Architecture for Ultrasound Imaging Systems **2256-2259**

Magee, David (Texas Instruments); Ali, Murtaza (Texas Instruments)*

10:10-10:25 FrA03.3

Experimental Characterization of a Vector Doppler System Based on a Clinical Ultrasound Scanner **2260-2263**

Eranki, Avinash (George Mason University); Sikdar, Siddhartha (George Mason University)*

10:25-10:40 FrA03.4

Optimization of Doppler Velocity Echocardiographic Measurements Using an Automatic Contour Detection Method **2264-2267**

Gaillard, Emmanuel (IRCM); Kadem, Lyes (Concordia University); Pibarot, Philippe (Laval University); Durand, Louis-Gilles (IRCM)*

10:40-10:55 FrA03.5

Estimating Vascular Volume Fraction in a Network of Small Blood Vessels with High-Frequency Power Doppler Ultrasound **2268-2271**

Pinter, Stephen Z. (University of Western Ontario); Lacefield, James C. (University of Western Ontario)*

10:55-11:10 FrA03.6

Tissue Vibration Pulsatility for Arterial Bleeding Detection Using Doppler Ultrasound **2272-2275**

Xie, Zhiyong (University of Washington); Kim, Eung-Hun (University of Washington); Kim, Yongmin (University of Washington)*

FrA04: 09:40-11:10 — Duluth Room

2.5.4 Electrical Source and Impedance Imaging (Oral Session)

Chair: Eung Je Woo, *Kyung Hee Univ.*

Co-Chair: Rosalind Sadleir, *Univ. of Florida*

09:40-09:55 FrA04.1

Magnetic Flux Density Measurement with Balanced Steady State Free Precession Pulse Sequence for MREIT: A Simulation Study **2276-2278**

Woo, Eung Je (Kyung Hee University); Lee, Soo Yeol (Kyung Hee University); Minhas, Atul S. (Kyung Hee University)*

09:55-10:10 FrA04.2

Experimental Setup for Developing Acousto-Electric Interaction Imaging **2279-2283**

Gendron, Mathieu (Ecole Polytechnique de Montreal); Guardo, Robert (Ecole Polytechnique de Montréal); Bertrand, Michel (Ecole Polytechnique)*

10:10-10:25 FrA04.3

Implementation of a Fast Reconfigurable Array for Tissue Impedance Characterization **2284-2287**

Habibi, Mohammad (University of Wisconsin - Milwaukee); Klemer, David (University of Wisconsin - Milwaukee); Raicu, Valerica (University of Wisconsin - Milwaukee)*

FrA05: 09:40-11:10 Marquette IV & V
SS 7. Stimulus Funding – and the Impact on the Medical and Biological Engineering Enterprise (Special Session)
Chair: Benjamin Corb, *American Inst. for Medical and Biological Engrg*

FrA06: 09:40-11:10 Conrad A
3.1.2 Acoustic, Mechanical and Bioelectrical Sensors (Oral Session)
Chair: Victor Lubecke, *Univ. of Hawaii Manoa*
Co-Chair: Mike McShane, *Texas A&M Univ.*

FrA08: 09:40-11:10 Marquette VIII
4.1.1 Structural Bioinformatics and Computational Proteomics (Oral Session)
Chair: Pengyu Ren, *University of Texas at Austin*
Co-Chair: Jie Liang, *University of Illinois at Chicago*

FrA09: 09:40-11:10 Marquette II
5.6.2 Cardiovascular Pulmonary Modeling (Computational) (Oral Session)
Chair: Masaru Sugimachi, *Natl Cardio Center Research Inst*
Co-Chair: John K-J. Li, *Rutgers Univ.*

FrA10: 09:40-11:10 Grand Ballroom - Salon C
6.3.3 Minisymposium: Neuromodulation
Chair: Dominique Durand, *Case Western Res. Univ.*

FrA11: 09:40-11:10 Marquette I
6.10.2 Virtual Reality in Rehabilitation (Oral Session)
Chair: Paolo Bonato, *Harvard Medical School*
Co-Chair: Emily Keshner, *Temple Univ.*

FrA12: 09:40-11:10 Marquette VI
7.3.1 Biomaterials (Oral Session)
Chair: Chun Wang, *Univ. of Minnesota*
Co-Chair: Shuming Nie, *Emory Univ.*

FrA13: 09:40-11:10 Conrad D
8.1.1 Therapeutic Robotics for Restoration of Function: Upper Extremity (Oral Session)
Chair: James Patton, *Rehab Inst. of Chicago & U. of Illinois at Chicago*
Co-Chair: Eugenio Guglielmelli, *Campus Bio-Medico Univ.*

FrA14: 09:40-11:10 Marquette III
S 3. Benefits and Pitfalls of University - Industry Collaborations (Special Symposium)
Chair: Deiter Haemmerich, *Medical Univ. of South Carolina*
Co-Chair: Wayne McDaniel, *Univ. of Missouri*

FrA15: 09:40-11:10 Marquette IX
10.1.1 Body Sensor Networks (Oral Session)
Chair: Yuan-Ting Zhang, *The Chinese Univ. of Hong Kong*
Co-Chair: Harry Tyrer, *Univ. of Missouri - Columbia*

09:55-10:10 FrA15.2
A Low-Complexity Medium Access Control Framework for Body Sensor Networks **2446-2449**
Wang, Bo (Shenzhen Institute of Advanced Technology); Wang, Lei (Shenzhen Institute of Advanced Technology); Huang, Bangyu (Shenzhen Institute of Advanced Technology); Wu, Dan (Shenzhen Institute of Advanced Technology); Lin, Shaojie (Shenzhen Institute of Advanced Technology); Zhang, Yuan-Ting (The Chinese University of Hong Kong); Chen, Wei (Wuhan University of Technology)*

10:10-10:25 FrA15.3
Packet Loss Mitigation for Biomedical Signals in Healthcare Telemetry **2450-2453**
Garudadri, Harinath (Qualcomm); Baheti, Pawan (Qualcomm)*

10:25-10:40 FrA15.4
Motion-Based Wake-Up Scheme for Ambulatory Monitoring in Wireless Body Sensor Networks **2454-2457**
Pek, Isaac (Institute for Infocomm Research); Waluyo, Agustinus Borgy (Institute for Infocomm Research); Yeoh, Wee Soon (Institute for Infocomm Research); Chen, Xiang (Institute for Infocomm Research)*

10:40-10:55 FrA15.5
Biometrics Based Novel Key Distribution Solution for Body Sensor Networks **2458-2461**
Miao, Fen (Shenzhen Institute of Advanced Technology); Li, Ye (Shenzhen Institute of Advanced Technology); Jiang, Lei (Shenzhen Institute of Advanced Technology,Chinese Academy of Sciences); Zhang, Yuan-Ting (The Chinese University of Hong Kong)*

10:55-11:10 FrA15.6
Avatar – A Multi-Sensory System for Real Time Body Position Monitoring **2462-2465**
Jovanov, Emil (University of Alabama in Huntsville); Hanish, Nathan (Northrop Grumman Information Systems); Courson, Victor (Northrop Grumman); Stidham, Jonathan (University of Alabama in Huntsville); Stinson, Hunter (University of Alabama in Huntsville); Webb, Christopher (University of Alabama in Huntsville); Kevin Denny, Kevin (UAH)*

FrA17: 09:40-11:10 Directors Row 4
SS 2. How to Effectively Deliver an Oral Presentation (Special Session)
Chair: Christopher James, *Univ. of Southampton*
Co-Chair: Cristian A. Linte, *Robarts Res. Inst.*

FrBPo01: 11:10-12:30 Grand Ballroom - Salon E, F, G
1.4.4 Biomedical Signal Classification III (Poster Session)

11:10-12:30 FrBPo01.1
Detection system of motor epileptic seizures through motion analysis with 3D accelerometers **2466-2469**
Jallon, Pierre (CEA Grenoble); Bonnet, Stéphane (CEA Léti MINATEC); Antonakios, Michel (CEA Léti Minatec); Guillemaud, Regis (CEA Léti MINATEC)*

11:10-12:30 FrBPo01.2
Robust Common Spatial Filters with a Maxmin Approach **2470-2473**
Kawanabe, Motoaki (Fraunhofer FIRST); Vidaurre, Carmen (Fraunhofer Institute); Scholler, Simon (Fraunhofer FIRST); Muller, Klaus-Robert (Fraunhofer FIRST)*

11:10-12:30 FrBPo01.3
Integrated Speech Enhancement for Functional MRI Environment **2474-2477**
Pathak, Nishank (UT Dallas); Milani, Ali (University of Texas at Dallas); Panahi, Issa (University of Texas at Dallas); Briggs, Richard (UT Southwestern Medical Center at Dallas)*

11:10-12:30 FrBPo01.4
A New Approach for ICD Rhythm Classification Based on Support Vector Machines **2478-2481**
Kamousi, Baharan (Stanford University/ U of Minnesota); Tewfik, Ahmed (University of Minnesota); wang, Paul (Stanford University)*

FrBPo02: 11:10-12:30 Grand Ballroom - Salon E, F, G
2.1.3 MR Acquisition and Reconstruction (Poster Session)

FrBPo03: 11:10-12:30 Grand Ballroom - Salon E, F, G
2.1.4 MR Diffusion Imaging (Poster Session)

FrBPo04: 11:10-12:30 Grand Ballroom - Salon E, F, G
2.5.5 Biomedical Microwave Imaging (Poster Session)

FrBPo05: 11:10-12:30 Grand Ballroom - Salon E, F, G
3.6.2 Micro- and Nanotechnologies (Poster Session)

FrBPo06: 11:10-12:30 Grand Ballroom - Salon E, F, G
4.3.3 Multiscale Biomedical Modeling (Poster Session)

FrBPo08: 11:10-12:30 Grand Ballroom - Salon E, F, G
6.8.1 Localization & Connectivity (Poster Session)

FrBPo09: 11:10-12:30 Grand Ballroom - Salon E, F, G
6.8.3 EMG and Neuromuscular Systems (Poster Session)

FrBPo10: 11:10-12:30 Grand Ballroom - Salon E, F, G
9.1.3 Internally Applied Therapeutic Devices II (Poster Session)

11:10-12:30 FrBPo10.23
Construction of Modular Novel Bioartificial Liver Support System **3095-3098**
Liu, Jianfeng (Institue of Electrical Engineering, Chinese Academy of Sciences); Song, Tao (Chinese Academy of Sciences); Jiang, Wei (Institute of Electrical Engineering, Chinese AcademyofSciences); Yimin, Zhang (Zhejiang University); Lanjuan, Li (Zhejiang University)*

11:10-12:30 FrBPo10.24
Direct Current Ablation Destroys Multi-Stage Fibrosarcomas in Rats **3099-3104**
Schroeppel, Edward (OncoStim, Inc.); Kroll, Kai (OncoStim, Inc.); Damon, Michael (OncoStim, Inc.); Kroll, Ashford (OncoStim, Inc.)*

FrKN3L: 13:30-15:00 Grand Ballroom - Salon A
Theme Keynote III
Chair: Zhi-Pei Liang, *Univ. of Illinois at Urbana-Champaign*
Co-Chair: Gregory A. Worrell, *Mayo Clinic*

13:30-14:15 FrKN3L.1
Frontiers in Biomedical Imaging with Ultrahigh Magnetic Fields ..... *
Ugurbil, Kamil (University of Minnesota)*

14:15-15:00 FrKN3L.2
Magnetic Resonance Elastography ..... *
Ehman, Richard L. (Mayo Clinic)*

FrC01: 13:30-15:00 Conrad B
1.2.3 Heart Sound Analysis (Oral Session)
Chair: Todd R. Reed, *Univ. of Hawaii, Manoa*
Co-Chair: Paulo Carvalho, *Univ. of Coimbra*

13:30-13:45 FrC01.1
A Computational Model of Cardiovascular Physiology and Heart Sound Generation **3105-3110**
Watrous, Raymond L. (Zargis Medical Corporation)*

13:45-14:00 FrC01.2
A Portable Graphical Representation Tool for Phonocardiograms **3111-3114**
Reed, Nancy E. (University of Hawaii); Nie, Yanhan (University of Hawaii); Mahnke, Christopher (TRIPLER ARMY MEDICAL CENTER)*

14:00-14:15 FrC01.3
Automated Heartsound Analysis/Computer-Aided Auscultation: A Cardiologist's Perspective and Suggestions for Future Development **3115-3118**
Mahnke, Christopher (TRIPLER ARMY MEDICAL CENTER)*

14:15-14:30 FrC01.4
Noise Detection During Heart Sound Recording **3119-3123**
Kumar, Dinesh (University of Coimbra); Carvalho, Paulo (University of Coimbra); Antunes, Manual (University of Coimbra); Henriques, Jorge (University of Coimbra)*

14:30-14:45 FrC01.5
Assessing Systolic Time-Intervals from Heart Sound: A Feasibility Study **3124-3128**
Carvalho, Paulo (University of Coimbra); Paiva, Rui Pedro (University of Coimbra); Couceiro, Ricardo (University of Coimbra); Henriques, Jorge (University of Coimbra); Quintal, Isabel (Centro Hospitalar de Coimbra); Muehlsteff, Jens (Philips); Aubert, Xavier (Philips Research Laboratories Europe, Aachen, GERMANY); Antunes, Manual (University of Coimbra)*

14:45-15:00 FrC01.6
Assessing PEP and LVET from Heart Sounds: Algorithms and Evaluation **3129-3133**
Paiva, Rui Pedro (University of Coimbra); Carvalho, Paulo (University of Coimbra); Aubert, Xavier (Philips Research Laboratories Europe, Aachen, GERMANY); Muehlsteff, Jens (Philips); Henriques, Jorge (University of Coimbra); Antunes, Manual (University of Coimbra)*

FrC02: 13:30-15:00 Conrad C
1.5.1 Principal Component Analysis and Independent Component Analysis (Oral Session)
Chair: Christopher James, *Univ. of Southampton*
Co-Chair: Issa Panahi, *Univ. of Texas at Dallas*

13:30-13:45 FrC02.1
Overcoming Measurement Time Variability in Brain Machine Interface **3134-3137**
Gowreesunker, B. Vikrham (University of Minnesota Twin Cities); Tewfik, Ahmed (University of Minnesota); Tadipatri, Vijay Aditya (University of Minnesota); Ince, Nuri Firat (University of Minnesota); Ashe, James (University of Minnesota); Pellizzer, Giuseppe (VA Medical Center)*

13:45-14:00 FrC02.2
An Optimal Spatial Filtering Electrode for Brain Computer Interface **3138-3141**
Besio, W. G. (University of Rhode Island); Kay, Steven (University of Rhode Island); Liu, Xiang (University of Rhode Island)*

14:00-14:15 FrC02.3
A Graph-Laplacian-Based Feature Extraction Algorithm for Neural Spike Sorting **3142-3145**
Ghanbari, Yasser (Southern Methodist University); Spence, Larry (Plexon Inc); Papamichalis, Panos (Southern Methodist University)*

14:15-14:30 FrC02.4
A Motion Sequence Fusion Technique Based on PCA for Activity Analysis in Body Sensor Networks **3146-3149**
Ghasemzadeh, Hassan (University of Texas at Dallas); Guenterberg, Eric (University of California, Los Angeles); Ostadabbas, Sarah (University of Texas at Dallas); Jafari, Roozbeh (University of Texas at Dallas)*

14:30-14:45 FrC02.5
Selective–Tap Blind Signal Processing for Speech Separation **3150-3153**
Kokkinakis, Kostas (University of Texas at Dallas); Loizou, Philipos (University of Texas at Dallas)*

14:45-15:00 FrC02.6
On Spatio-Temporal Component Selection in Space-Time Independent Component Analysis: An Application to Ictal EEG **3154-3157**
James, Christopher (University of Southampton); Demanuele, Charmaine (University of Southampton)*

FrC03: 13:30-15:00 Grand Ballroom - Salon B
2.5.3 Electrical Impedance Imaging (Oral Session)
Chair: Ryan Halter, *Dartmouth Coll.*
Co-Chair: Ulrich Katscher, *Philips Res. Europe - Hamburg*

13:30-13:45 FrC03.1
Electrical Conductivity Imaging Using MRI Measurement of the Magnetic Field Vector **3158-3161**
Joy, Michael L.G. (University of Toronto); Nachman, Adrian I. (University of Toronto); DeMonte, Tim P. (Field Metrica Inc.); Wang, Dinghui (University of Toronto); Ma, Weijing (University of Toronto)*

13:45-14:00 FrC03.2
Electrical Conductivity Imaging Using Magnetic Resonance Tomography **3162-3164**
Katscher, Ulrich (Philips Research Europe - Hamburg); Voigt, Tobias (Philips Research Europe - Hamburg); Findeklee, Christian (Philips Research Europe - Hamburg)*

14:00-14:15 FrC03.3
Animal and Human Imaging Experiments in Magnetic Resonance Electrical Impedance Tomography (MREIT) **3165-3168**
Woo, Eung Je (Kyung Hee University)*

14:15-14:30 FrC03.4
Detection of Intraventricular Blood Using EIT in a Neonatal Piglet Model **3169-3172**
Sadleir, Rosalind (University of Florida); Tang, Te (University of Florida); Tucker, Aaron (University of Florida); Borum, Peggy (University of Florida); Weiss, Michael D. (University of Florida)*

FrC05: 13:30-15:00 Marquette IV & V
9.2.1 Neuromuscular Incapacitation Devices (Oral Session)
Chair: Dorin Panescu, *NewCardio, Inc.*
Co-Chair: Wayne McDaniel, *Univ. of Missouri*

FrC06: 13:30-15:00 Conrad A
3.5.1 Wireless Sensors and Telemetry (Oral Session)
Chair: Sameer Sonkusale, *Tufts Univ.*
Co-Chair: Maysam Ghovanloo, *Georgia Inst. of Tech.*

FrC07: 13:30-15:00 Marquette VII
12.1.3 Recent Advances in Novel Optical Imaging Technologies (Oral Session)
Chair: Xingde Li, *Johns Hopkins Univ.*
Co-Chair: Lev Perelman, *Beth Israel Deaconess Medical Center, Harvard Medical School*

FrC08: 13:30-15:00 Marquette VIII
4.3.2 Model Identification and Parameter Estimation (Oral Session)
Chair: May Dongmei Wang, *Georgia Tech. and Emory Univ.*

FrC09: 13:30-15:00 Marquette II
5.3.2 Cardiac Electrophysiology (Mapping, CRT, ICD, Ablation, Arrhythmias) (Oral Session)
Chair: Nick Skadsberg, *Medtronic, Inc.*
Co-Chair: Guanglin Li, *Chinese Acad. of Sciences*

FrC10: 13:30-15:00 Grand Ballroom - Salon C
6.7.2 Deep Brain Stimulation I (Oral Session)
Chair: Kendall Lee, *Mayo Clinic*
Co-Chair: David Mogul, *Illinois Inst. of Tech.*

FrC11: 13:30-15:00 Marquette I
6.1.1 Neural Modeling and Computing I (Oral Session)
Chair: John White, *University of Utah*
Co-Chair: Tay Netoff, *Univ. of Minnesota*

FrC12: 13:30-15:00 Marquette VI
7.6.1 Cellular Force Transduction (Oral Session)
Chair: Nathan Sniadecki, *University of Washington*
Co-Chair: Kris Noel Dahl, *Carnegie Mellon University*

FrC13: 13:30-15:00 Conrad D
8.4.1 Human-Robot Interaction I (Oral Session)
Chair: José del R. Millán, *Swiss Federal Inst. of Tech. Lausanne*
Co-Chair: Jose M. Carmena, *Univ. of California, Berkeley*

FrC14: 13:30-15:00 Marquette III
9.1.2 Ablation Therapies (Oral Session)
Chair: Timothy Bigelow, *Iowa State Univ.*
Co-Chair: John Anthony Pearce, *Univ. of Texas at Austin*

FrC15: 13:30-15:00 Marquette IX
10.5.1 Computer-Aided Decision Making I (Oral Session)
Chair: Donna L. Hudson, *Univ. of California, San Francisco*
Co-Chair: Raouf Naguib, *Coventry Univ.*

13:45-14:00 FrC15.2
Fuzzy Naive Bayesian Model for Medical Diagnostic Decision Support **3409-3412**
Wagholikar, Kavishwar (University of Pune); Vijayraghavan, Sundararajan (Center for Development of Advanced Computing (CDAC)); Deshpande, Ashok (University of California,)*

14:00-14:15 FrC15.3
Piecewise-Linear Trend Detection in Longitudinal Physiological Measurements **3413-3416**
Redmond, Stephen James (University of New South Wales); Basilakis, Jim (University of NSW); Celler, Branko George (University of New South Wales); Lovell, Nigel H (University of New South Wales)*

14:15-14:30 FrC15.4
A Platform for Testing and Comparing of Real-Time Decision-Support Algorithms in Mobile Environments **3417-3420**
Khitrov, Maxim (U.S. Army Medical Res. and Materiel Command); Rutishauser, Matthew (Intelesense Technologies, Inc.); Montgomery, Kevin (Intelesense Technologies); Reisner, Andrew (Massachusetts General Hospital); Reifman, Jaques (U.S. Army Medical Research)*

14:30-14:45 FrC15.5
REFEROCOD: A Probabilistic Method to Medical Coding Support **3421-3424**
Lecornu, Laurent (GET ENST Bretagne); THILLAY, Gregoire (Institut Telecom, telecom Bretagne); Le Guillou, Clara (University Hospital); Garreau, Pierre Jean (University Hospital (CHU)); SALIOU, Philippe (University Hospital (CHU)); JANTZEM, Hélène (University Hospital (CHU)); Puentes, John (TELECOM Bretagne - INSERM); Cauvin, Jean-Michel (Universitary Hospital (CHU))*

14:45-15:00 FrC15.6
Decision Support System for Resource Allocation in Emergency Management **3425-3428**
Kondaveti, Russell (University of Massachusetts, Amherst); Ganz, Aura (University of Massachusetts, Amherst)*

FrC17: 13:30-15:00 Directors Row 4
SS 1. Meet the Editors (Special Session)
Chair: Andrew Laine, *Columbia Univ.*
Co-Chair: Bruce Wheeler, *Univ. of Florida*

FrDPo01: 15:00-16:40 Grand Ballroom - Salon E, F, G
1.3.4 Biomedical Nonlinear Dynamics (Poster Session)

15:00-16:40 FrDPo01.1
Fractal, Entropic and Chaotic Approaches to Complex Physiological Time Series Analysis: A Critical Appraisal **3429-3432**
Li, Cheng (Fudan University); Ding, Guang-Hong (Fudan University); Wu, Guoqiang (Fudan University); Poon, Chi-Sang (Massachusetts Institute of Technology)*

15:00-16:40 FrDPo01.2
Bifurcations in Morris-Lecar Model Exposed to DC Electric Field **3433-3436**
Che, Yanqiu (Tianjin University); Wang, Jiang (Tianjin University); Li, Huiyan (Tianjin Univ of Technology & Ed); wei, xile (Tianjin University); Deng, Bin (Tianjin Universiy); Dong, Feng (tianjin University)*

15:00-16:40 FrDPo01.3
A Comparison of Linear and Chaotic Measures for Rat Hippocampal EEG during Different Vigilance States **3437-3440**
Ning, Taikang (Trinity College); Grare, Adam (Trinity College); Ning, James (Dartmouth College)*

15:00-16:40 FrDPo01.4
Detrended Fluctuation Analysis of EEG in Detecting Cross Modal Plasticity in Brain for Blind **3441-3444**
Manickam, Kalaivani (Jerusalem College of Engineering,); Gurubharan, Ravindaran (Anna University)*

FrDPo02: 15:00-16:40 Grand Ballroom - Salon E, F, G
1.9.3 Pattern Recognition Methods for Data Mining (Poster Session)

FrDPo03: 15:00-16:40 Grand Ballroom - Salon E, F, G
2.4.2 X-ray CT (Poster Session)

FrDPo04: 15:00-16:40 Grand Ballroom - Salon E, F, G
2.7.4 Biomedical Image Analysis and Processing (Poster Session)

FrDPo05: 15:00-16:40 Grand Ballroom - Salon E, F, G
3.3.2 Bioelectric Sensors II (Poster Session)

FrDPo06: 15:00-16:40 Grand Ballroom - Salon E, F, G
3.5.3 Wireless Sensors and Systems (Poster Session)

FrDPo07: 15:00-16:40 Grand Ballroom - Salon E, F, G
4.2.2 Algorithms and Tools for Genomics and Proteomics (Poster Session)

FrDPo08: 15:00-16:40 Grand Ballroom - Salon E, F, G
4.3.4 Physiological Modeling and Algorithms for Physiome (Poster Session)

FrDPo09: 15:00-16:40 Grand Ballroom - Salon E, F, G
5.4.1 Respiratory Function (Poster Session)

15:00-16:40 FrDPo09.1
Optimal Tissue Types in the Thoracic Electrical Impedance Model for Thoracic Electrical Bioimpedance (TEB) Studies **3913-3916**
Akhand, Mohammad Shafiul Haque (The University of Queensland); Trakic, Adnan (The University of Queensland); Terrill, Philip Ian (University of Queensland); Liu, Feng (The University of Queensland); Wilson, Stephen (University of Queensland); Crozier, Stuart (The University of Queensland)*

15:00-16:40 FrDPo09.2
Simulated Central Apnea Detection Using the Pressure Variance **3917-3920**
Townsend, Daphne (Carleton University); Holtzman, Megan (Carleton University); Goubran, Rafik A. (Carleton University); Frize, Monique (Carleton University); Knoefel, Frank-Dietrich (SCO Health Service)*

15:00-16:40 FrDPo09.3
Classification of Breathing Events Using Load Cells under the Bed **3921-3924**
Beattie, Zachary Todd (Oregon Health & Science University); Hagen, Chad (Oregon Health & Science University); Pavel, Michael (Oregon Health and Science University); Hayes, Tamara (Oregon Health and Science University)*

15:00-16:40 FrDPo09.4
Evaluation of the Respiratory Muscular Function by Means of Diaphragmatic Mechanomyographic Signals in COPD Patients **3925-3928**
Sarlabous, Leonardo (Universitat Politècnica de Catalunya (UPC)); Torres, Abel (Universitat Politècnica de Catalunya (UPC), Institute for Bioengineering of Catalonia (IBEC) and CIBER de Bioingeniería, Biomate); Fiz Fernandez, José Antonio (Navarra Hospital); Gea, Joaquim (IMIM- Hospital del Mar, UPF, CIBERES); Martínez-Llorens, Juana M. (IMIM- Hospital del Mar, UPF, CIBERES); Jané, Raimon (Universitat Politècnica de Catalunya)*

FrDPo10: 15:00-16:40 Grand Ballroom - Salon E, F, G
5.6.1 Cardiovascular Modeling (Poster Session)

15:00-16:40 FrDPo10.1
On the Ill-Conditioned Nature of the Intracardiac Inverse Problem **3929-3931**
Bates, Jason H T (University of Vermont, College of Medicine); Spector, Peter (University of Vermont and Fletcher Allen Health Care)*

15:00-16:40 FrDPo10.2
Simulation of AV Hysteresis Pacing Using an Integrated Dual Chamber Heart and Pacer Model **3932-3935**
Lian, Jie (Micro Systems Engineering, Inc.); Garner, Garth (Micro Systems Engineering Inc); Kraetschmer, Hannes (Micro Systems Engineering Inc); Muessig, Dirk (Micro Systems Engineering, Inc.)*

15:00-16:40 FrDPo10.3
Effects of Elevated Homocysteine Hormone on Electrical Activity in the Human Atrium: A Simulation Study **3936-3939**
Law, Phillip R (The University of Manchester); Kharche, Sanjay (University of Manchester); Stott, Jonathan (The University of Manchester); Zhang, Henggui (University of Manchester)*

15:00-16:40 FrDPo10.4
The Pressure Recovery Ratio: The Invasive Index of LV Relaxation During Filling. Model-Based Prediction with In-Vivo Validation **3940-3943**
Zhang, Wei (Washington University); Shmuylovich, Leonid (Washington University in St Louis); Kovács, Sándor J (Washington University in St Louis)*

15:00-16:40 FrDPo10.5
The Effects of Non-Linearities on Shear Stress in Periodic Flow in Axi-Symmetric Vessels **3944-3947**
Park, Chang Sub (University of Oxford); Payne, Stephen John (University of Oxford)*

15:00-16:40 FrDPo10.6
Shock Induced Electrical Activation in Structurally Detailed Models of Pig Left-Ventricular Tissue **3948-3951**
Trew, Mark L. (University of Auckland); Ashton, Jesse L (University of Auckland); Caldwell, Bryan (University of Auckland); Smaill, Bruce (University of Auckland)*

15:00-16:40 FrDPo11.12

FrE01: 16:40-18:10 Conrad B
1.2.4 Signal Processing and Physiological System Modeling (Oral Session)
Chair: Zahra Moussavi, *Univ. of Manitoba*

16:40-16:55 FrE01.1

16:55-17:10 FrE01.2

17:10-17:25 FrE01.3

17:25-17:40 FrE01.4

17:40-17:55 FrE01.5

FrE02: 16:40-18:10 Conrad C
1.5.2 Independent Component Analysis (Oral Session)
Chair: Metin Akay, *Arizona State Univ.*
Co-Chair: Jose Principe, *Univ. of Florida*

16:40-16:55 FrE02.1

16:55-17:10 FrE02.2

17:10-17:25 FrE02.3

FrE03: 16:40-18:10 Grand Ballroom - Salon B
2.1.5 Magnetic Resonance Imaging (Oral Session)
Chair: Ed X. Wu, *The Univ. of Hong Kong*
Co-Chair: Jim Xiuquan Ji, *Texas A&M Univ.*

FrE04: 16:40-18:10 Duluth Room
2.3.1 Optical Imaging, Microscopy, and Infrared Imaging I (Oral Session)
Chair: Taner Akkin, *Univ. of Minnesota*
Co-Chair: Hao Zhang, *Univ. of Wisconsin-Milwaukee*

FrE05: 16:40-18:10 Marquette IV & V
3.8.1 BioNano Technology (Oral Session)
Chair: Jordan Green, *Johns Hopkins Univ.*
Co-Chair: Ilko Ilev, *US FDA*

FrE06: 16:40-18:10 Conrad A
3.11.1 Wearable Technologies I (Oral Session)
Chair: Maysam Ghovanloo, *Georgia Inst. of Tech.*
Co-Chair: Claudine Gehin, *INSA Lyon*

16:40-16:55 FrE06.1
Development of Data Communication System with Ultra High Frequency Radio Wave for Implantable Artificial Hearts **4110-4115**
Tsujimura, Shinichi (University of Tsukuba); Yamagishi, Hiroto (University of Tsukuba); Sankai, Yoshiyuki (University of Tsukuba)*

16:55-17:10 FrE06.2
Development of CNT-Based Inductors for Integrated Biosensors **4116-4119**
Kim, Bruce (University of Alabama)*

17:10-17:25 FrE06.3
Design and Validation of an Ambulatory System for the Measurement of the Microcirculation in the Capillaries: µHematron Device **4120-4123**
TOUMI, DAREEN (INSA Lyon); Gehin, Claudine (INSA Lyon); Dittmar, Andre (INSA Lyon); McAdams, Eric (University of Ulster)*

17:25-17:40 FrE06.4
Stretchable Interconnections for Flexible Electronic Systems **4124-4127**
Lin, Jianhui (Tsinghua University); YAN, Bing (Tsinghua University); WU, Xiaoming (Tsinghua University); REN, Tianling (Tsinghua University); LIU, Litian (Tsinghua University)*

17:40-17:55 FrE06.5
Thermal Parameters Measurement on Fire Fighter During Intense Fire Exposition **4128-4131**
Oliveira, Aurélien (INSA Lyon); Gehin, Claudine (INSA Lyon); DELHOMME, Georges (INSA Lyon); Dittmar, Andre (INSA Lyon); McAdams, Eric (University of Ulster)*

17:55-18:10 FrE06.6
Design, Simulation and Fabrication of a Low Cost Capacitive Tactile Shear Sensor for a Robotic Hand **4132-4135**
Shashank, Arridh (University of New South Wales and Sydney Medical School.); Tiwana, Mohsin I. (University of New South Wales); Redmond, Stephen James (University of New South Wales); Lovell, Nigel H (University of New South Wales)*

FrE07: 16:40-18:10 Marquette VII
3.4.1 Biological and Chemical Sensors (Oral Session)
Chair: Ruikang Wang, *Oregon Health & Science Univ.*
Co-Chair: Babak Parviz, *Univ. of Washington*

16:40-16:55 FrE07.1
Skin Characteristics by Laser Generated Surface Waves **4136-4139**
Huang, Zhihong (University of Dundee); L'Etang, Adele J (University Of Dundee)*

16:55-17:10 FrE07.2
A Comparison of Retinal Prosthesis Electrode Array Substrate Materials **4140-4143**
Weiland, James (University of Southern California); Humayun, Mark (University of Southern California); Eckhardt, Helmut (Premitec, Inc.); Ufer, Stefan (Premitec Inc.); LAUDE, Lucien (USC); Basinger, Brooke (University of Southern California); Tai, Yu-Chong (California Institute of Technology)*

17:10-17:25 FrE07.3
Combining Microfluidics and Electrochemical Detection **4144-4146**
Ferrigno, Rosaria (Université Claude Bernard Lyon 1); Pittet, Patrick (Université Claude Bernard Lyon 1); STEPHAN, Khaled (Université Claude Bernard Lyon 1); Leca-Bouvier, Béatrice (Université Claude Bernard Lyon 1); Galvan, Jean-Marc (CPE); Renaud, Louis (Universite Claude Bernard Lyon 1); Morin, Pierre (Université Lyon1 Claude Bernard)*

17:25-17:40 FrE07.4
Microfluidic Cellular and Molecular Detection for Lab-On-A-Chip Applications **4147-4149**
Lee, Abraham (University of California, Irvine)*

17:40-17:55 FrE07.5
Novel Laser Therapy and Diagnosis Using Mid-Infrared Laser **4150-4153**
Awazu, Kunio (Osaka University); Ishii, Katsunori (Osaka University); Hazama, Hisanao (Osaka University)*

17:55-18:10 FrE07.6
Fluorescence Biosensing in Nanopores **4154-4157**
Karolin, Jan Olof (University of Strathclyde); Birch, David (University of Strathclyde)*

FrE08: 16:40-18:10 Marquette VIII
4.7.1 Emerging Topics in Computational Bioinformatics and Systems Biology (Oral Session)
Chair: May Dongmei Wang, *Georgia Tech and Emory University*
Co-Chair: Daniel A. Beard, *Medical Coll. of Wisconsin*

16:40-16:55 FrE08.1
Ontologies for Cancer Nanotechnology Research **4158-4161**
Thomas, Dennis George (Washington University in St. Louis); Pappu, Rohit (Washington University in St. Louis); Baker, Nathan (Washington University in St. Louis)*

16:55-17:10 FrE08.2
Emerging Translational Bioinformatics: Knowledge-Guided Biomarker Identification for Cancer Diagnostics **4162-4165**
Phan, John H. (Georgia Institute of Technology); Yin-Goen, Qiqin (Emory University); Young, Andrew N (Emory University); Wang, May Dongmei (Georgia Tech and Emory University)*

17:10-17:25 FrE08.3
Structure of Brain Functional Networks **4166-4170**
Kuchaiev, Oleksii (University of California, Irvine); Wang, Po T (University of California Irvine); Nenadic, Zoran (UC Irvine); Przulj, Natasa (University of California Irvine)*

17:25-17:40 FrE08.4
Design of Experiments for Identification of Complex Biochemical Systems with Applications to Mitochondrial Bioenergetics **4171-4174**
Vinnakota, Kalyan (Medical College of Wisconsin); Beard, Daniel A. (Medical College of Wisconsin); Dash, Ranjan (Medical College of Wisconsin)*

17:40-17:55 FrE08.5
Visual Annotation of the Gene Database **4175-4177**
Wen, Jing (University of Illinois At Chicago); Wang, Xishu (University of Illinois At Chicago); Kibbe, Warren (Northwestern University); Lin, Simon (Northwestern University); Lu, Hui (University of Illinois at Chicago)*

17:55-18:10 FrE08.6
SimpleVisGrid: Grid Services for Visualization of Diverse Biomedical Knowledge and Molecular Systems Data **4178-4181**
Stokes, Todd (Georgia Institute of Technology); Wang, May Dongmei (Georgia Tech and Emory University)*

FrE09: 16:40-18:10 Marquette II
5.11.1 Nonlinear Dynamics in Cardiac Electrophysiology (Oral Session)
Chair: Alena Talkachova, *University of Minnesota*

16:40-17:10 FrE09.1
Effects of Hypocalcemia on Electrical Restitution and Ventricular Fibrillation **4182-4185**
Riccio, Mark (Cornell University); Hua, Fei (Cornell University); Lomonte, Dina (Cornell University); Venator, Kurt (Cornell University); Cerda-Gonzalez, Sophia (Cornell University); Gilmour, Robert (Cornell University)*

17:10-17:25 FrE09.2
Spatial Heterogeneity of Restitution Properties and the Onset of Alternans **4186-4189**
Dobrovolny, Hana Maria (Ryerson University); Berger, Carolyn (Duke University Physics Department); Brown, Ninita H. (Duke University); Neu, Wanda Krassowska (Duke University); Gauthier, Daniel J (Duke University)*

17:25-17:40 FrE09.3
Electrotonic Effects on Action Potential Duration in Perfused Rat Hearts **4190-4193**
Walton, Richard David (University of Leeds); Bernus, Olivier (University of Leeds)*

17:40-17:55 FrE09.4
Monitoring Intramyocardial Reentry Using Alternating Transillumination **4194-4197**
Mitrea, Bogdan G (SUNY Upstate Medical University); Wellner, Marcel (SUNY Upstate Medical University); Pertsov, Arkady M. (SUNY Upstate Medical University)*

17:55-18:10 FrE09.5
Measures of Cardiac Contractility Variability During Ischemia **4198-4201**
Patangay, Abhilash (Boston Scientific Corporation); Zhang, Yi (Boston Scientific Corporation); Lewicke, Aaron (Boston Scientific)*

FrE10: 16:40-18:10 Grand Ballroom - Salon C

6.5.1 Neural Sensing and Applications (Oral Session)
Chair: Pedram Mohseni, *Case Western Reserve University*
Co-Chair: Dustin Tyler, *Case Western Res. Univ.*

16:40-16:55 FrE10.1
A Micropower Support Vector Machine Based Seizure Detection Architecture for Embedded Medical Devices **4202-4205**
Shoeb, Ali (Massachusetts Institute of Technology); Carlson, David (Medtronic); Panken, Eric (Medtronic); Denison, Timothy (Medtronic)*

16:55-17:10 FrE10.2
Improved Decoding of Limb-State Feedback from Natural Sensors **4206-4209**
Wagenaar, Joost (University of Pittsburgh); Ventura, Valerie (Carnegie Mellon University); Weber, Douglas (University of Pittsburgh)*

17:10-17:25 FrE10.3
Neural Sensing of Electrical Activity with Stretchable Microelectrode Arrays **4210-4213**
Yu, Zhe (Columbia University); Graudejus, Oliver (Princeton University); Lacour, Stéphanie (University of Cambridge); Wagner, Sigurd (Princeton University); Morrison, Barclay (Columbia University)*

17:25-17:40 FrE10.4
A Biomimetic Adaptive Algorithm and Low-Power Architecture for Implantable Neural Decoders **4214-4217**
Rapoport, Benjamin Isaac (Massachusetts Institute of Technology); Wattanapanitch, Woradorn (Massachusetts Institute of Technology); Penagos, Hector L. (Massachusetts Institute of Technology); Musallam, Sam (Caltech); Anderson, Richard A. (Caltech); Sarpeshkar, Rahul (Massachusetts Institute of Technology)*

17:40-17:55 FrE10.5
Micropower Non-Contact EEG Electrode with Active Common-Mode Noise Suppression and Input Capacitance Cancellation **4218-4221**
Chi, Yu (UCSD); Cauwenberghs, Gert (University of California San Diego)*

17:55-18:10 FrE10.6
A Configurable IC for Wireless Real-Time In Vivo Monitoring of Chemical and Electrical Neural Activity **4222-4225**
Roham, Masoud (Case Western Reserve University); Blaha, Charles (University of Memphis); Garris, Paul (Mayo Clinic); Lee, Kendall (Mayo Clinic); Mohseni, Pedram (Case Western Reserve University)*

FrE11: 16:40-18:10 Marquette I

6.1.2 Neural Modeling and Computing II (Oral Session)
Chair: John White, *University of Utah*
Co-Chair: Dominique Durand, *Case Western Res. Univ.*

16:40-17:10 FrE11.1
Mechanisms of Coherent Activity in Hippocampus and Entorhinal Cortex **4226-4227**
White, John (University of Utah); Fernandez, Fernando (University of Utah); Kispersky, Tilman (Boston University)*

FrE12: 16:40-18:10 Marquette VI
7.8.1 Cellular Therapies and Regenerative Medicine (Oral Session)
Chair: Bradley E. Layton, *Drexel Univ.*
Co-Chair: Chun Wang, *Univ. of Minnesota*

FrE13: 16:40-18:10 Conrad D
8.8.1 Multiscale Biomechanics (Oral Session)
Chair: Vicente Grau, *Univ. of Oxford*
Co-Chair: Victor Barocas, *Univ. of Minnesota*

FrE14: 16:40-18:10 Marquette III
9.3.1 Image-Guided Therapies (Oral Session)
Chair: Dieter Haemmerich, *Medical Univ. of South Carolina*
Co-Chair: John Bischof, *Univ. of Minnesota*

17:40-17:55 FrE14.5
Periodic Contrast-Enhanced Computed Tomography for Thermal Ablation Monitoring: A Feasibility Study **4299-4302**
Brace, Christopher (University of Wisconsin); Mistretta, Charles (University of Wiscosin); Hinshaw, J Louis (University of Wisconsin); Lee, Fred (University of Wisconsin)*

17:55-18:10 FrE14.6
Numerical Models of Laser Fusion of Intestinal Tissues **4303-4306**
Pearce, John Anthony (University of Texas at Austin)*

FrE15: 16:40-18:10 Marquette IX
10.4.2 Ambient Assisted Living, Smart Homes for the Elderly with Chronic Diseases (Oral Session)
Chair: Toshiyo Tamura, *Chiba Univ.*
Co-Chair: Majd Alwan, *AAHSA*

16:40-16:55 FrE15.1
Passive In-Home Health and Wellness Monitoring: Overview, Value and Examples **4307-4310**
Alwan, Majd (American Association of Homes and Services for the Aging(AAHSA))*

16:55-17:10 FrE15.2
Privacy and Social Implications of Distinct Sensing Approaches to Implementing Smart Homes for Older Adults **4311-4314**
Demiris, George (University of Washington)*

17:10-17:25 FrE15.3
How Do Health Care Providers Perceive Technologies for Monitoring Older Adults? **4315-4318**
Thompson, Hilaire (University of Washington); Thielke, Stephen (University of Washington)*

17:25-17:40 FrE15.4
Sleep Assessment Using a Passive Ballistocardiography-Based System: Preliminary Validation **4319-4322**
Mack, David (WellAWARE Systems); Patrie, James (University of Virginia); Felder, Robin (The University of Virginia); Suratt, Paul (University of Virginia Medical School); Alwan, Majd (American Association of Homes and Services for the Aging(AAHSA))*

17:40-17:55 FrE15.5
A Fully Automated Health-Care Monitoring at Home without Attachment of Any Biological Sensors and Its Clinical Evaluation **4323-4326**
Motoi, Kosuke (Kanazawa University); Ueno, Hiroshi (Imizu City Hospital); Kuwae, Yutaka (Fujimoto Hayasuzu Hospital); Ikarashi, Akira (Ishikawa Sunrise Industries Creation); Yuji, Tadahiko (Fujimoto Hayasuzu Hospital); Higashi, Yuji (Fujimoto Hayasuzu Hospital); Tanaka, Shinobu (Kanazawa University); Fujimoto, Toshiro (Fujimoto Hayasuzu Hospital); Asanoi, Hidetsugu (Imizu City Hospital); Yamakoshi, Ken-ichi (Kanazawa University)*

17:55-18:10 FrE15.6
Recreation Activity Monitoring System Using Proximity Sensors **4327-4330**
Tsukamoto, Sosuke (Tokyo Denki University); Tsumagari, Yuko (Fujimoto Hayasuzu Hospital); Hoshino, Hiroshi (Tokyo Denki University); Tamura, Toshiyo (Chiba University)*

FrE16: 16:40-18:10 Grand Ballroom - Salon A
S 2. Federal Funding in Biomedical Engineering (Special Symposium)
Chair: Bin He, *Univ. of Minnesota*
Co-Chair: Semahat Demir, *National Science Foundation*

16:40-17:00 FrE16.1
Cohen, Zohara (National Institute of Biomedical Imaging and Bioengineering, NIH)

17:00-17:20 FrE16.2
Demir, Semahat (National Science Foundation)

17:20-17:40 FrE16.3
Charles, John B. (NASA Johnson Space Center)

17:40-18:00 FrE16.4
Xu, Guo Feng (National Institutes of Health)

FrE17: 16:40-18:10 Directors Row 4
SS 3. Writing Scientific Articles (Special Session)
Chair: Matthias Reumann, *IBM T. J. Watson Res. Center*
Co-Chair: Cristian A. Linte, *Robarts Res. Inst.*

Saturday, 5 September 2009

SaPL1: 08:30-09:30 Grand Ballroom - Salon D
Plenary Lecture III
Chair: Xiaochuan Pan, *Univ. of Chicago*

08:30-09:30 SaPL1.1
Biological Engineering & Systems Biology – New Opportunities for Engineers in Biotech/Pharma Industry ..... *
Lauffenburger, Douglas (Massachusetts Institute of Technology)*

SaKN4L: 09:40-11:10 Grand Ballroom - Salon A
Theme Keynote IV
Chair: Bruce Wheeler, *Univ. of Florida*

09:40-11:10 SaKN4L.1
Molecular Imaging with PET, A Revolution in Biological Research and Practice of Medicine ..... *
Alavi, Abass (University of Pennsylvania School of Medicine)*

SaA01: 09:40-11:10 Conrad B
1.2.8 Biomedical Modelling (Oral Session)
Chair: Dong Ming, *Tianjin Univ.*
Co-Chair: Daniel A. Beard, *Medical Coll. of Wisconsin*

09:40-09:55 SaA01.1
Forecasting Intracranial Pressure Elevation Using Pulse Waveform Morphology 4331-4334
Hamilton, Robert (University of California, Los Angeles); Xu, Peng (University of California, Los Angeles); Vespa, Paul (University of California, Los Angeles); Bergsneider, Marvin (University of California, Los Angeles); Hu, Xiao (University of California, Los Angeles)*

09:55-10:10 SaA01.2
Enhanced EMG Signal Processing for Simultaneous and Proportional Myoelectric Control 4335-4338
Nielsen, Johnny Luther Gredal (Aalborg University); Holmgaard, Steffen (Aalborg University); Jiang, Ning (Aalborg University); Farina, Dario (Aalborg University); parker, philip (university of new brunswick); Englehart, Kevin (University of New Brunswick)*

10:10-10:25 SaA01.3
A Fuzzy Logic Model for Hand Posture Control Using Human Cortical Activty Recorded by Micro-ECoG Electrodes 4339-4342
vinjamuri, ramana (Univ. of Pittsburgh); Weber, Douglas (Univ. of Pittsburgh); Degenhart, Alan (Univ. of Pittsburgh); Collinger, Jennifer (Univ. of Pittsburgh); Sudre, Gustavo (Carnegie Melon Univ.); Adelson, P. David (Children's Neuroscience Institute, Phoenix Children's Hospital); Holder, Deborah (Univ. of Pittsburgh); Boninger, Michael (Univ. of Pittsburgh); Schwartz, Andrew (Univ. of Pittsburgh); Crammond, Donald (Univ. of Pittsburgh); Tyler-Kabara, Elizabeth (Univ. of Pittsburgh); Wang, Wei (Univ. of Pittsburgh)*

10:25-10:40 SaA01.4
Data Mining of Patients on Weaning Trials from Mechanical Ventilation Using Cluster Analysis and Neural Networks 4343-4346
Arizmendi, Carlos (Technical University of Catalonia (UPC)); Romero, Enrique (Technical University of Catalonia (UPC)); Alquezar, René (Technical University of Catalonia (UPC)); Caminal, Pere (Technical University of Catalonia (UPC)); Diaz, Ivan (Hospital de la Santa Creu i Sant Pau); Benito, Salvador (Hospital de la Santa Creu i Sant Pau); Giraldo, Beatriz (Universitat Poiltècnica de Catalunya)*

SaA02: 09:40-11:10 Conrad C
1.3.1 Nonlinear Dynamic Analysis of Biomedical Signals (Oral Session)
Chair: David Westwick, *Univ. of Calgary*
Co-Chair: Robert Edward Kearney, *McGill Univ.*

SaA03: 09:40-11:10 Grand Ballroom - Salon B
2.1.6 MR Cardiovascular Imaging (Oral Session)
Chair: Jim Xiuquan Ji, *Texas A&M Univ.*
Co-Chair: Yi Wang, *Cornell Univ.*

09:55-10:10 SaA03.2

A MRI Myocardial Perfusion Analysis Tool **4387-4390**

Née, Guillaume (Greyc CNRS 6072 - Université de Caen - Ensicaen); Jehan-Besson, Stéphanie (Laboratoire LIMOS); Brun, Luc (Greyc CNRS 6072 - Université de Caen - Ensicaen); Revenu, Marinette (Greyc CNRS 6072 - Université de Caen - Ensicaen); Hamon, Michèle (CHU Caen); Hamon, Martial (CHU Caen); Perrin, Muriel (GE)*

10:10-10:25 SaA03.3

An Image Processing Algorithm for the In-Vivo Quantification and Visualization of Septum Motion in Type III B - Aortic Dissections with Cine Magnetic Resonance Imaging **4391-4394**

Karmonik, Christof (The Methodist Hospital Neurological Inst); Bismuth, Jean (The Methodist Hospital DeBakey Heart and Vascular Center); Davies, Mark (The Methodist DeBakey Heart and Vascular Center); Younes, Houssam (The Methodist DeBakey Heart and Vascular Center); Lumsden, Alan (The Methodist DeBakey Heart and Vascular Center)*

10:25-10:40 SaA03.4

MR Investigation of the Coupling between Myocardial Fiber Architecture and Cardiac Contraction **4395-4398**

Wu, Yin (Shenzhen Institute of Advanced Technology); Wu, Ed X. (The University of Hong Kong)*

10:40-10:55 SaA03.5

Segmentation and Length Measurement of the Abdominal Blood Vessels in 3D MRI Images **4399-4402**

Babin, Danilo (Ghent University)*

10:55-11:10 SaA03.6

An Automated Quantification of the Transmural Myocardial Infarct Extent Using Cardiac DE-MR Images **4403-4406**

EL-Berbari, Racha (INSERM); Kachenoura, Nadjia (INSERM); FROUIN, Frederique (INSERM); Herment, Alain (INSERM); Mousseaux, Elie (HEGP); Bloch, Isabelle (Télécom ParisTech - CNRS UMR 5141 LTCI)*

SaA04: 09:40-11:10 Duluth Room

2.2.2 Ultrasound Imaging I (Oral Session)

Chair: Elisa Konofagou, *Columbia Univ.*

Co-Chair: Andrew Laine, *Columbia Univ.*

09:40-09:55 SaA04.1

Key Parameters for Precise Lateral Displacement Estimation in Ultrasound Elastography **4407-4410**

Luo, Jianwen (Columbia University); Konofagou, Elisa (Columbia University)*

09:55-10:10 SaA04.2

Measurement of Tissue Mechanical Properties with Shear Wave Dispersion Ultrasound Vibrometry (SDUV) **4411-4414**

Greenleaf, James (Mayo Clinic); Urban, Matthew (Mayo Clinic College of Medicine); Chen, Shigao (Mayo Clinic College of Medicine)*

10:10-10:25 SaA04.3

Vibro-Acoustography Imaging Applications for the Prostate **4415-4419**

Fatemi, Mostafa (Mayo Clinic); Mitri, Farid G. (Mayo Clinic)*

10:25-10:40 SaA04.4

Screening of Thyroid Nodules by Ultrasound Elastography Using Diastolic Strain Variation **4420-4423**

Luo, Si (University of Washington); Kim, Eung-Hun (University of Washington); Dighe, Manjiri (University of Washington); Kim, Yongmin (University of Washington)*

10:40-10:55 SaA04.5

Ultrasonic Viscoelasticity Imaging of Nonpalpable Breast Lesions **4424-4427**

Qiu, Yupeng (University of Illinois at Urbana-Champaign); Insana, Michael F. (University of Illinois)*

10:55-11:10 SaA04.6

In Vitro Renal Cortex Elasticity and Viscosity Measurements with Shearwave Dispersion Ultrasound Vibrometry (SDUV) on Swine Kidney **4428-4431**

Amador, Carolina (Mayo Clinic College of Medicine); Urban, Matthew (Mayo Clinic College of Medicine); Warner, Lizette (Mayo Clinic); Greenleaf, James (Mayo Clinic)*

SaA05: 09:40-11:10 Marquette V
2.9.2 Neuroimaging I (Oral Session)
Chair: Bradley Roth, *Oakland Univ.*
Co-Chair: Michael L.G. Joy, *Univ. of Toronto*

09:40-09:55 SaA05.1
Magnetic Resonance Electric Property Imaging of Brain Tissues **4432-4435**
Zhang, Xiaotong (University of Minnesota); Zhu, Shanan (Zhejiang University); He, Bin (University of Minnesota)*

09:55-10:10 SaA05.2
Functional MRI of Postnatal Visual Development in Normal Rat Superior Colliculi **4436-4439**
Chan, Kevin C. (The University of Hong Kong); Xing, Kai (The University of Hong Kong); Cheung, Matthew M. (The University of Hong Kong); Zhou, Iris Yuwen (The University of Hong Kong); Wu, Ed X. (The University of Hong Kong)*

10:10-10:25 SaA05.3
Extended Time-Frequency Granger Causality for Evaluation of Functional Network Connectivity in Event-Related FMRI Data **4440-4443**
Havlicek, Martin (Brno University of Technology); Jan, Jiri (Brno University of Technology); Calhoun, Vince (The Mind Research Network/University of New Mexico); Brazdil, Milan (Masaryk University Brno)*

10:25-10:40 SaA05.4
A Bayesian Spatio - Temporal Approach for the Analysis of Fmri Data with Non - Stationary Noise **4444-4448**
Oikonomou, Vangelis (University of Ioannina); Tripoliti, Evanthia (University of Ioannina); Fotiadis, Dimitrios I. (University of Ioannina)*

10:40-10:55 SaA05.5
Effect on BOLD Sensitivity Due to Susceptibility-Induced Echo Time Shift in Spiral-In Based Functional MRI **4449-4452**
Zhuo, Yue (University of Illinois at Urbana-Champaign); Sutton, Bradley P. (University of Illinois at Urbana-Champaign)*

SaA06: 09:40-11:10 Conrad A
3.1.3 Sensor Technology (Oral Session)
Chair: Gang Yao, *Univ. of Missouri*
Co-Chair: Lei Wang, *Shenzhen Inst. of Advanced Tech.*

09:40-09:55 SaA06.1
Accelerometer Based Measurement for the Mapping of Neck Surface Vibrations During Vocalized Speech **4453-4456**
Nolan, Mark (Dublin Institute of Technology); Madden, Brian (Dublin Institute of Technology); Burke, Edward (Dublin Institute of Technology)*

09:55-10:10 SaA06.2
Intervention of Cardiomyocyte Death Based on the Impedance-Sensing Technique of Monitoring Cell Adhesion **4457-4460**
Qiu, Yiling (Boston University); Liao, Ronglih (Brigham and Women's Hospital, Harvard Medical School); Xin, Zhang (Boston University)*

10:10-10:25 SaA06.3
Validation of Human Skin Models in the MHz Region. **4461-4464**
Huclova, Sonja (ETH Zurich); Froehlich, Juerg (Swiss Federal Institute of Technology Zurich (ETH)); Falco, Lisa (Solianis Monitoring AG); Dewarrat, François (Solianis Monitoring AG); Talary, Mark S. (Solianis Monitoring AG); Vahldieck, Ruediger (ETH Zurich)*

10:25-10:40 SaA06.4
Monitoring Change of Body Fluids During Physical Exercise Using Bioimpedance Spectroscopy **4465-4468**
Beckmann, Lisa (RWTH Aachen University); Hahne, Sebastian (RWTH Aachen University); Medrano, Guillermo (Aachen University); Kim, Saim (RWTH Aachen University); Walter, Marian (RWTH Aachen University); Leonhardt, Steffen (RWTH Aachen University)*

SaA07: 09:40-11:10 Marquette VII
3.10.1 Minisymposium: Frontier of Nano Magnetic Materials, Devices and Systems in Biomedical Applications
Chair: Jianping Wang, *Univ. of Minnesota*
Co-Chair: Michael Neuman, *Michigan Tech. Univ.*

SaA08: 09:40-11:10 Marquette VIII
4.3.1 Algorithm for Physiome and Physiological Modeling (Oral Session)
Chair: Peter Hunter, *Univ. of Auckland*
Co-Chair: Daniel A. Beard, *Medical College of Wisconsin*

10:55-11:10 SaA08.6
Skin-Electrode Circuit Model for Use in Optimizing Energy Transfer in Volume Conduction Systems 4508-4511
Hackworth, Steven A. (University of Pittsburgh); Sun, Mingui (University of Pittsburgh); Sclabassi, Robert (University of Pittsburgh)*

SaA09: 09:40-11:10 Marquette II
5.3.1 Cardiac Electrophysiology (Oral Session)
Chair: Lu Fei, *Univ. of Minnesota*
Co-Chair: Abhijit Patwardhan, *Univ. of Kentucky*

09:40-09:55 SaA09.1
A Morphologically Realistic Shell Model of Atrial Propagation and Ablation 4512-4515
Al Abed, Amr (University of New South Wales); Dokos, Socrates (University of New South Wales); Lovell, Nigel H (University of New South Wales)*

09:55-10:10 SaA09.2
A New Approach to Measure the Contribution of Restitution to Repolarization Alternans 4516-4518
Agarwal, Anuj (University of Kentucky); Patwardhan, Abhijit (University of Kentucky)*

10:10-10:25 SaA09.3
Variability of Action Potential Duration in Pharmacologically Induced Long QT Syndrome Type 1 4519-4522
Ring, Caroline (Duke University); Idriss, Salim F. (Duke University Medical Center); Neu, Wanda Krassowska (Duke University)*

10:25-10:40 SaA09.4
A Novel Near-Infrared Voltage-Sensitive Dye Reveals the Action Potential Wavefront Orientation at Increased Depths of Cardiac Tissue 4523-4526
Walton, Richard David (University of Leeds); Mitrea, Bogdan G (SUNY Upstate Medical University); Pertsov, Arkady M. (SUNY Upstate Medical University); Bernus, Olivier (University of Leeds)*

10:40-10:55 SaA09.5
Enhanced Susceptibility to Alternans in a Rabbit Model of Chronic Myocardial Infarction 4527-4530
Lou, Qing (Washington University in St. Louis); Efimov, Igor (Washington University in St. Louis)*

SaA10: 09:40-11:10 Grand Ballroom - Salon C
6.4.3 Brain-Computer Interface (Oral Session)
Chair: Han Yuan, *University of Minnesota*
Co-Chair: Cuntai Guan, *Inst. for Infocomm Res.*

09:40-09:55 SaA10.1
Adaptive Active Auditory Brain Computer Interface 4531-4534
Hong, Bo (Tsinghua university); Lou, Bin (Tsinghua University); Guo, Jing (Tsinghua University); Gao, Shangkai (Tsinghua University)*

09:55-10:10 SaA10.2
Cortical Decoding of Individual Finger and Wrist Kinematics for an Upper-Limb Neuroprosthesis 4535-4538
Aggarwal, Vikram (Johns Hopkins University); Tenore, Francesco (Johns Hopkins University); Acharya, Soumyadipta (Johns Hopkins University); Schieber, Marc (University of Rochester); Thakor, Nitish (Johns Hopkins University)*

10:10-10:25 SaA10.3
Cortical Imaging of Sensorimotor Rhythms for BCI Applications 4539-4542
Yuan, Han (University of Minnesota); He, Bin (University of Minnesota)*

10:25-10:40 SaA10.4
Comparison of Designs towards a Subject-Independent Brain-Computer Interface Based on Motor Imagery 4543-4546
Lotte, Fabien (Insitute for Infocomm Research); Guan, Cuntai (Institute for Infocomm Research); Ang, Kai Keng (Institute for Infocomm Research)*

10:40-10:55 SaA10.5
EEG-Based Online Two-Dimensional Cursor Control **4547-4550**
Huang, Dandan (Virginia Commonwealth University); Lin, Peter (National Institute of Neurological Disorders, NationalInstitutes of Health); Fei, Ding-Yu (Virginia Commonwealth University); Chen, Xuedong (Huazhong University); Bai, Ou (Virginia Commonwealth University)*

10:55-11:10 SaA10.6
Learning to Use a Brain-Machine Interface: Model, Simulation and Analysis **4551-4554**
Jimenez, Jessica (University of California Berkeley); Héliot, Rodolphe (UC Berkeley); Carmena, Jose M. (University of California, Berkeley)*

SaA11: 09:40-11:10 Marquette I
6.3.1 Neural Prostheses I (Oral Session)
Chair: James Weiland, *University of Southern California*
Co-Chair: Bradley Greger, *Univ. of Utah*

09:40-09:55 SaA11.1
Sparse Generalized Laguerre-Volterra Model of Neural Population Dynamics **4555-4558**
Song, Dong (University of Southern California); Chan, Rosa H. M. (University of Southern California); Marmarelis, Vasilis (University of Southern California); Hampson, Robert (Wake Forest University); Deadwyler, Sam (Wake Forest University); Berger, Theodore (University of Southern California)*

09:55-10:10 SaA11.2
Nonstationary Modeling of Neural Population Dynamics **4559-4562**
Chan, Rosa H. M. (University of Southern California); Song, Dong (University of Southern California); Berger, Theodore (University of Southern California)*

10:10-10:25 SaA11.3
Microfluidic Neurotransmiter-Based Neural Interfaces for Retinal Prosthesis **4563-4565**
Iezzi, Raymond (Mayo Clinic)*

10:25-10:40 SaA11.4
Preliminary Results from the ArgusTM II Epiretinal Prosthesis Feasibility Study **4566-4568**
Humayun, Mark (University of Southern California); Dorn, Jessy (Second Sight Medical Products); Humayun, Mark (USC / Doheny Eye Institute); Caspi, Avi (Second Sight); Filley, Eugene (Retina Foundation of the Southwest); Dagnelie, Gislin (Johns Hopkins Univ); Salzmann, Joel (Geneva University Hospitals); Santos, Arturo (Universidad de Guadalajara); Duncan, Jacque (UCSF); da Cruz, Lyndon (Moorfields Eye Hospital); Mohand Said, Saddek (Centre Hospitalier Universitaire des XV XX); Eliott, Dean (University of Southern California Keck School of Medicine); Greenberg, Robert (Second Sight Medical Products, Inc.); McMahon, Matthew J. (Second Sight Medical Products Inc)*

10:40-10:55 SaA11.5
Biomimetic Image Processing for Retinal Prosthesis – Simulated Vision Experiments **4569-4572**
Parikh, Neha (University of Southern California); McIntosh, Ben (University of Southern California); Tanguay, Armand (University of Southern California); Humayun, Mark (University of Southern California); Weiland, James (University of Southern California)*

10:55-11:10 SaA11.6
Multi-Scale Recordings for Neuroprosthetic Control of Finger Movements **4573-4577**
Baker, Justin (University of Utah); Bishop, William (Johns Hopkins Applied Physics Lab); Kellis, Spencer (University of Utah); Levy, Todd (Johns Hopkins University); House, Paul (University of Utah); Greger, Bradley (University of Utah)*

SaA12: 09:40-11:10 Marquette VI
7.2.1 Minisymposium: Bionanotechnology
Chair: John Bischof, *Univ. of Minnesota*
Co-Chair: Carston R. Wagner, *Univ. of Minnesota*

09:40-10:10 SaA12.1
Biomedical Nanotechnology for Molecular Imaging, Diagnostics, and Targeted Therapy **4578-4579**
Nie, Shuming (Emory University)*

SaA13: 09:40-11:10 Conrad D
8.4.2 Human-Robot Interaction II (Oral Session)
Chair: Silvestro Micera, *Scuola Superiore Sant'Anna*
Co-Chair: José del R. Millán, *Swiss Federal Inst. of Tech. Lausanne*

SaA14: 09:40-11:10 Marquette III
9.1.5 Internally Applied Therapeutic Devices I (Oral Session)
Chair: Doug Hettrick, *Medtronic, Inc.*
Co-Chair: Robert P. Patterson, *Univ. of Minnesota*

SaA15: 09:40-11:10 Marquette IX
10.7.1 Health Information Integration (Oral Session)
Chair: Emil Jovanov, *Univ. of Alabama in Huntsville*

SaA17: 09:40-11:10 Directors Row 4
SS 5. Negotiating your First Bioengineering Job: Academia, Private Sector or Government (Special Session)
Chair: Cristian A. Linte, *Robarts Res. Inst.*

SaA18: 09:40-11:10 Marquette IV
S 4. Clinical Data: From Medical Institutions to Industrial Research – IP Protection Approaches (Special Symposium)
Chair: Nicolas Chbat, *Philips Res. North America*

09:40-09:55 SaA18.1
Dennis, Charles (Medtronic)

09:55-10:10 SaA18.2
Herasevich, Vitaly (Mayo Clinic)

10:10-10:25 SaA18.3
Kettelberger, Denise (Faegre & Benson, LLP)

10:25-10:40 SaA18.4
Leonard, Robert (Faegre & Benson, LLP)

10:40-10:55 SaA18.5
Mark, Roger (Massachusetts Institute of Technology)

10:55-11:10 SaA18.6
Zaleski, John (Philips Research North America)

SaBPo01: 11:10-12:30 Grand Ballroom - Salon E, F, G
1.2.11 Biomedical Signal Processing (Poster Session)

11:10-12:30 SaBPo01.1
A Probabilistic Framework for Learning Robust Common Spatial Patterns 4658-4661
Wu, Wei (Masschusetts Institute of Technology); Chen, Zhe (Harvard Medical School/MIT); Gao, Shangkai (Tsinghua University); Brown, Emery N (MGH-Harvard Medical School-MIT)*

11:10-12:30 SaBPo01.2
Multiparameter Analysis of Heart Rate Variability Signal for the Investigation of High Risk Fetuses 4662-4665
Ferrario, Manuela (Politecnico di Milano); Magenes, Giovanni (University of Pavia); Campanile, Marta (Università Federico II di Napoli); Carbone, Imma Floriana (Università Federico II di Napoli); Di Lieto, Andrea (Università Federico II di Napoli); Signorini, Maria G. (Politecnico di Milano)*

11:10-12:30 SaBPo01.3
Adaptive Rule Based Fetal QRS Complex Detection Using Hilbert Transform 4666-4669
Ulusar, Umit Deniz (University of Arkansas at Little Rock); Govindan, Rathinaswamy (UAMS); Wilson, James (University of Arkansas at Little Rock); Lowery, Curtis (University of Arkansas for Medical Sciences); Preissl, Hubert (University of Tübingen); Eswaran, Hari (Univ of Arkansas for Medical Sci)*

11:10-12:30 SaBPo01.4
Multivariate Analysis of Intracranial Pressure (ICP) Signal Using Principal Component Analysis 4670-4673
Al-Zubi, Nayel (University of Liverpool); Momani, Lina (University of Liverpool); Alkharabsheh, Abdel Rahman (University of Liverpool); Al-Nuaimy, Waleed (University of Liverpool)*

11:10-12:30 SaBPo01.5
Auditory MEG Responses to Removal of a Tpone in C Major Scale Measured in a Pair of Reciprocal Oddball Schemes 4674-4677
Nemoto, Iku (Tokyo Denki University)*

SaBPo02: 11:10-12:30 Grand Ballroom - Salon E, F, G
2.10.2 Photo-Acoustic and Magneto-Acoustic Imaging (Poster Session)

11:10-12:30 SaBPo02.3
Pulsed Magneto-Acoustic Imaging **4771-4774**
Mehrmohammadi, Mohammad (University of Texas at Austin); Oh, Junghwan (Pukyong National University); aglyamov, salavat (University of Texas at Austin); Andrei, Karpiouk (University of Texas at Austin); Emelianov, Stanislav (University of Texas at Austin)*

SaBPo03: 11:10-12:30 Grand Ballroom - Salon E, F, G
2.9.3 Neuroimaging II (Poster Session)

11:10-12:30 SaBPo03.1
Manganese-Enhanced MRI of Hypoxic-Ischemic Brain Injuries Using Mn-DPDP **4775-4778**
Yang, Jian (Xi'an Jiaotong University); Wu, Ed X. (The University of Hong Kong)*

11:10-12:30 SaBPo03.2
Development of NTU Standard Chinese Brain Template: Morphologic and Functional Comparison with MNI Template Using Magnetic Resonance Imaging **4779-4782**
Jao, Tun (National Taiwan University); Chang, Chun-Yuan (National Taiwan University); Lee, Chia-Wei (National Taiwan University); Wu, Edzer (National Taiwan University); Ho, Chien Chang (National Taiwan University); Tsou, Chi-Hsuan (National Taiwan University); Chen, Der-Yow (National Taiwan University); Wu, Changwei (National Taiwan University); Chen, Jyh-Horng (National Taiwan University)*

11:10-12:30 SaBPo03.3
Accurate Activation Map Detection Using Bootstrap Resampling of Single Fmri Data **4783-4786**
Darki, Fahimeh (Tehran University of Medical Sciences); Oghabian, Mohammad Ali (Tehran University of Medical Sciences)*

11:10-12:30 SaBPo03.4
A Hybrid Approach for Compressive Neural Activity Detection with Functional MR Images **4787-4790**
Li, Chuan (the University of Alabama); hao, qi (the University of Alabama); guo, weihong (Case Western Reserved University); Hu, Fei (the University of Alabama)*

11:10-12:30 SaBPo03.5
Parameter Estimation in Arterial Spin Labeling MRI: Comparing the Four Phase Model and the Buxton Model with Fourier Transform **4791-4794**
Pham, Vincent (Texas A&M University); Xiaoping, Zhu (University of Manchester); Li, Ka-Loh (University of California); Ji, Jim Xiuquan (Texas A&M University)*

11:10-12:30 SaBPo03.6
On Clustering Fmri Using Potts and Mixture Regression Models **4795-4798**
Xia, Jing (University of Illinois at Urbana-Champaign); Liang, Feng (University of Illinois at Urbana-Champaign); Wang, Yongmei Michelle (University of Illinois at Urbana-Champaign)*

11:10-12:30 SaBPo03.7
The Relationship between Conductivity Uncertainties and EEG Source Localization Accuracy **4799-4802**
Wang, Gang (University of Minnesota); Yang, Lin (University of Minnesota); Worrell, Gregory A. (Mayo Clinic); He, Bin (University of Minnesota)*

SaBPo04: 11:10-12:30 Grand Ballroom - Salon E, F, G
3.11.2 Wearable Technologies II (Poster Session)

11:10-12:30 SaBPo04.1
I-NET: Interactive Neuro-Educational Technology to Accelerate Skill Learning **4803-4807**
Raphael, Giby (Advanced Brain Monitoring Inc); Berka, Chris (Advanced Brain Monitoring)*

11:10-12:30 SaBPo04.2
Radar Cross Section of Human Cardiopulmonary Activity for Recumbent Subject **4808-4811**
Kiriazi, John (University of Hawaii at Manoa); Boric-Lubecke, Olga (University of Hawaii Manoa); Lubecke, Victor (University of Hawaii Manoa)*

SaBPo05: 11:10-12:30 Grand Ballroom - Salon E, F, G
3.12.2 Implantable Technologies (Poster Session)

11:10-12:30 SaBPo05.1
Wireless Instantaneous Neurotransmitter Concentration Sensing System (WINCS) for Intraoperative Neurochemical Monitoring **4856-4859**
Kimble, Christopher (Mayo Clinic); Johnson, David (Mayo Clinic); Winter, Bruce (Mayo Clinic); Whitlock, Sidney (Mayo Foundation); Kressin, Ken (Mayo Clinic); Horne, April (Mayo Clinic); Robinson, Justin (Mayo Clinic); Bledsoe, Jonathan (Mayo Clinic); Tye, Susannah (Mayo Clinic); Chang, Su-Youne (Mayo Clinic); Agnesi, Filippo (Mayo Clinic); Griessenauer, Christoph (Mayo Clinic); Covey, Daniel (Mayo Clinic); Shon, Young-Min (Mayo Clinic); Bennet, Kevin E (Mayo Clinic); Garris, Paul (Mayo Clinic); Lee, Kendall (Mayo Clinic)*

11:10-12:30 SaBPo05.2
Energetic Analysis for Self-Powered Cochlear Implants **4860-4863**
Accoto, Dino (Scuola Superiore Sant'Anna); Calvano, Marta (University Campus Bio-Medico Rome); Campolo, Domenico (Campus Bio-Medico University); Salvinelli, Fabrizio (Università CAMPUS Bio-Medico); Guglielmelli, Eugenio (Campus Bio-Medico University)*

11:10-12:30 SaBPo05.3
Design and Fabrication of a Low Cost Implantable Bladder Pressure Monitor **4864-4867**
Axisa, Fabrice (IMEC); Jourand, Philippe (Katholieke Universiteit Leuven); Lippens, Evi (Ghent University); Rymarczyk-Machal, Monika (Ghent University); De Smet, Nele (Ugent); Schacht, Etienne (Ghent University); Vanfleteren, Jan (IMEC / Ghent University); Puers, Robert (Catholic University of Leuven); cornelissen, ria (Gent University)*

11:10-12:30 SaBPo05.4
Implantable Bioimpedance Monitor Using ZigBee **4868-4871**
Bogonez Franco, Paco (Technical University of Catalonia (UPC)); Bragos, Ramon (Technical University of Catalonia (UPC)); Bayes-Genis, Antoni (Hospital de la Santa Creu i Sant Pau); Rosell, Javier (Technical University of Catalonia)*

11:10-12:30 SaBPo05.5
A Wireless Batteryless In Vivo EKG and Core Body Temperature Sensing Microsystem with 60 Hz Suppression Technique for Untethered Genetically Engineered Mice Real-Time Monitoring **4872-4875**
Chaimanonart, Nattapon (Case Western Reserve University); Young, Darrin (Case Western Reserve University)*

11:10-12:30 SaBPo05.6
Energy-Quality System Design for In-Body Communication **4876-4879**
Zhang, Yuwei (Shenzhen Institute of Advanced Technology); Li, Ye (Shenzhen Institute of Advanced Technology); Qiao, Dengyu (Shenzhen Institute of Advanced Technology); Zhang, Yuan-Ting (The Chinese University of Hong Kong)*

11:10-12:30 SaBPo05.7
In Vitro Cytotoxicity Testing and the Application of Elastic Interconnection Technology for Short-Term Implantable Electronics **4880-4883**
Brosteaux, Dominique (Ghent University); Lippens, Evi (Ghent University); cornelissen, ria (Gent University); Carta, Riccardo (Catholic University of Leuven (K.U.Leuven)); Jourand, Philippe (Katholieke Universiteit Leuven); Puers, Robert (Catholic University of Leuven); Axisa, Fabrice (IMEC); Vervust, Thomas (UGent); Bossuyt, Frederick (TFCG IMEC Ghent); Vanfleteren, Jan (IMEC / Ghent University); Schacht, Etienne (Ghent University)*

SaBPo06: 11:10-12:30 Grand Ballroom - Salon E, F, G
4.7.2 Biomedical Modeling and Simulation (Poster Session)

11:10-12:30 SaBPo06.1
Combining Boolean Method with Delay Times for Determining Behaviors of Biological Networks **4884-4887**
Lyu, SuPing (Medtronic, Inc.)*

SaBPo07: 11:10-12:30 Grand Ballroom - Salon E, F, G
6.1.3 Computational Modeling of Neuromuscular Systems (Poster Session)

SaBPo08: 11:10-12:30 Grand Ballroom - Salon E, F, G
6.6.2 Neural Signal Processing II (Poster Session)

11:10-12:30 SaBPo08.3
Using Microstate Intensity for the Analysis of Spontaneous EEG: Tracking Changes from Alert to the Fatigue State **4982-4985**
Thuraisingham, Ranjit Arulnayagam (University of Technology Sydney); Tran, Yvonne (University of Technology, Sydney); Craig, Ashley (University of Technology, Sydney); Wijesuriya, Nirupama (The University of Sydney); Nguyen, Hung T. (University of Technology, Sydney)*

11:10-12:30 SaBPo08.4
Surface EMG Signal Decomposition Using Empirically Sustainable BioSignal Separation Principles **4986-4989**
Nawab, Syed Hamid (Boston University); De Luca, Carlo J. (Boston University); Chang, Shey-Sheen (Boston University)*

11:10-12:30 SaBPo08.5
Information Theoretical Assessment of Neural Spiking Activity with Temperature Modulation **4990-4993**
Madhok, Jai (Johns Hopkins School of Medicine); Jia, Xiaofeng (Johns Hopkins School of Medicine); Choi, Young-Seok (Johns Hopkins University School of medicine); Zhang, Dandan (Tsinghua University); Thakor, Nitish (Johns Hopkins University)*

11:10-12:30 SaBPo08.6
Effect of Remifentanil on the Nonlinear Electroencephalographic Entropy Parameters in Propofol Anesthesia **4994-4997**
Kortelainen, Jukka Johannes (University of Oulu); Koskinen, Miika (Helsinki University of Technology); Mustola, Seppo Tapani (South Karelia Central Hospital); Seppänen, Tapio (University of Oulu)*

11:10-12:30 SaBPo08.7
Research for the Characteristics of Alzheimer's Disease Using EEG **4998-5001**
Ueda, Taishi (Tokyo Institute of Technology); Yagi, Tohru (Tokyo Institute of Technology)*

11:10-12:30 SaBPo08.8
A Modification to the Group Delay and Simulated Annealing Technique for Characterization of Peripheral Nerve Fiber Size Distributions for Non-Deterministic Sampled Data **5002-5005**
Szlavik, Robert (California Polytechnic State University)*

11:10-12:30 SaBPo08.9
A Regularized Point Process Generalized Linear Model for Assessing the Functional Connectivity in the Cat Motor Cortex **5006-5009**
Chen, Zhe (Harvard Medical School/MIT); Putrino, David (Massachusetts General Hospital, Harvard Medical School); Ba, Demba (MIT); Ghosh, Soumya (University of Western Australia); Barbieri, Riccardo (MGH-Harvard Medical School-MIT); Brown, Emery N (MGH-Harvard Medical School-MIT)*

11:10-12:30 SaBPo08.10
Decoding Three-Dimensional Hand Kinematics from Electroencephalographic Signals **5010-5013**
Bradberry, Trent (University of Maryland); Gentili, Rodolphe (University of Maryland); Contreras-Vidal, José (University of Maryland)*

11:10-12:30 SaBPo08.11
Correlation of Sleep EEG Frequency Bands and Heart Rate Variability **5014-5017**
Abdullah, Haslaile (RMIT University); Holland, Gerard (St. Luke's Hospital); Cosic, Irena (RMIT University); Cvetkovic, Dean (RMIT University)*

11:10-12:30 SaBPo08.12
Emotion-Induced Higher Wavelet Entropy in the EEG with Depression During a Cognitive Task **5018-5021**
wei, ling (Shanghai University); Li, YingJie (Shanghai University); Ye, jiping (Shanghai University); Yang, Xiaoli (Purdue University Calumet); Wang, Jijun (Shanghai Mental Health Center, Shanghai Jiaotong University School of Medicine)*

SaBPo09: 11:10-12:30 Grand Ballroom - Salon E, F, G
8.1.3 Rehabilitation Robotics (Poster Session)

11:10-12:30 SaBPo09.1
Bio-Inspired Controller for a Dexterous Prosthetic Hand Based on Principal Components Analysis **5022-5025**
Matrone, Giulia (University of Pavia); Cipriani, Christian (Scuola Superiore Sant'anna); Secco, Emanuele Lindo (Eucentre); Carrozza, Maria Chiara (Scuola Superiore Sant'Anna); Magenes, Giovanni (University of Pavia)*

SaBPo11: 11:10-12:30 Grand Ballroom - Salon E, F, G
10.2.2 eHealth (Poster Session)

SaBPo12: 11:10-12:30 Grand Ballroom - Salon E, F, G
8.8.3 Biomechanical Modeling and Simulation II (Poster Session)

SaBPo13: 11:10-12:30 Grand Ballroom - Salon E, F, G
6.13.2 Diagnostic & Evaluation Techniques for Neurological Disorders II (Poster Session)

11:10-12:30 SaBPo13.6
A New Method for Reflex Threshold Estimation in Spastic Muscles **5300-5303**
Chardon, Matthieu (Rehabilitation Institute of Chicago); Suresh, Nina (Rehabilitation Institute of Chicago); Rymer, William Zev (Northwest. & Rehab Inst of Chicago)*

SaKN5L: 13:30-15:00 Grand Ballroom - Salon A
Theme Keynote V
Chair: John W. Clark, *Rice Univ.*

13:30-14:15 SaKN5L.1
Towards A Completely Biological Living Heart Valve Replacement ..... *
Tranquillo, Robert (University of Minnesota)*

14:15-15:00 SaKN5L.2
The VPH/Physiome Project: A Role for EMBS? ..... *
Hunter, Peter (University of Auckland)*

SaC01: 13:30-15:00 Conrad B
1.2.9 Biomedical Modelling and Simulation III (Oral Session)
Chair: Giovanni Magenes, *Univ. of Pavia*
Co-Chair: Mingui Sun, *Univ. of Pittsburgh*

13:30-13:45 SaC01.1
Implicit Wiener Series Analysis of Epileptic Seizure Recordings **5304-5307**
Barbero, Álvaro (Universidad Autónoma de Madrid); Franz, Matthias O. (HTWG Konstanz); van Drongelen, Wim (The University of Chicago); Dorronsoro, José R. (Universidad Autónoma de Madrid); Schölkopf, Bernhard (MPI for Biological Cybernetics); Grosse-Wentrup, Moritz (Max Planck Institute for Biological Cybernetics)*

13:45-14:00 SaC01.2
Identification of Small World Topologies in Neural Functional Connections Quantified by Phase Synchrony Measures **5308-5311**
Bolanos, Marcos (Michigan State University); Bernat, Edward (University of Minnesota); Aviyente, Selin (Michigan State University)*

14:00-14:15 SaC01.3
Quantizing and Characterizing the Variance of Hand Postures in a Novel Transformation Task **5312-5315**
vinjamuri, ramana (University of Pittsburgh); Crammond, Donald (University of Pittsburgh); Mao, Zhi-Hong (University of Pittsburgh)*

14:15-14:30 SaC01.4
EEG Dynamics During Music Appreciation **5316-5319**
Lin, Yuan-Pin (National Taiwan University); Jung, Tzyy-Ping (University of California San Diego); Chen, Jyh-Horng (National Taiwan University)*

14:30-14:45 SaC01.5
The Mechanism of Synchronization of Chemical Coupled Neurons **5320-5323**
Chen, Yingyuan (Tianjin University); Wang, Jiang (Tianjin University); Che, Yanqiu (Tianjin University); wei, xile (Tianjin University); Dong, Feng (tianjin University)*

14:45-15:00 SaC01.6
Automated Detection of Asynchrony in Patient-Ventilator Interaction **5324-5327**
Mulqueeny, Qestra Camille (University of New South Wales); Redmond, Stephen James (University of New South Wales); Lovell, Nigel H (University of New South Wales)*

SaC02: 13:30-15:00 Conrad C
1.3.2 Biomedical Modelling and Simulation II (Oral Session)
Chair: Ramakrishna Mukkamala, *Michigan State Univ.*
Co-Chair: Riccardo Barbieri, *MGH-Harvard Medical School-MIT*

13:30-13:45 SaC02.1
Dynamic Control of Maximal Ventricular Elastance in Conscious Dogs before and after Pacing-Induced Heart Failure **5328-5331**
Chen, Xiaoxiao (Michigan State University); Mukkamala, Ramakrishna (Michigan State University); Sala-Mercado, Javier (Wayne State University School of Medicine); Hammond, Robert (Wayne State University School of Medicine); Ichinose, Masashi (Wayne State University School of Medicine); Soltani, Soroor (Michigan State University); O'Leary, Donal (Wayne State University School of Medicine)*

13:45-14:00 SaC02.2
Identification of Vascular Responses to Exercise and Orthostatic Stress in Bed Rest-Induced Cardiovascular Deconditioning **5332-5335**
Aletti, Federico (Politecnico di Milano); Ferrario, Manuela (Politecnico di Milano); Tam, Enrico (Università degli studi di Bologna); Cautero, Michela (Università degli Studi di Verona); Cerutti, Sergio (Politecnico di Milano); Capelli, Carlo (Università di Verona); Baselli, Giuseppe (Politecnico di Milano)*

14:00-14:15 SaC02.3
Linear and Nonlinear Quantification of Respiratory Sinus Arrhythmia During Propofol General Anesthesia **5336-5339**
Chen, Zhe (Harvard Medical School/MIT); Purdon, Patrick L (Massachussetts General Hospital); Pierce, Eric (MGH / Harvard Medical School); Harrell, Priscilla Grace (MGH-Harvard Medical School); Walsh, John (Massachusetts General Hospital); Salazar, Andres F. (Massachussets General Hospital); Tavares, Casie (Massachusetts General Hospital); Brown, Emery N (MGH-Harvard Medical School-MIT); Barbieri, Riccardo (MGH-Harvard Medical School-MIT)*

14:15-14:30 SaC02.4
Low-Complexity Autoregressive Modeling of the Fast and Slow QT Adaptation to Heart Rate Changes **5340-5343**
Cabasson, Aline (University of Nice Sophia Antipolis); Meste, Olivier (UNSA-CNRS)*

14:30-14:45 SaC02.5
Novel Methods for Estimating the Ballistocardiogram Signal Using a Simultaneously Acquired Electrocardiogram **5344-5347**
Inan, Omer (Stanford University); Etemadi, Mozziyar (Stanford University); Wiard, Richard M. (Stanford University); Kovacs, Gregory T.A. (Stanford University); Giovangrandi, Laurent (Stanford University)*

14:45-15:00 SaC02.6
Subclinical Atherosclerosis Modeling: Integration of Coronary Artery Calcium Score to Framingham Equation **5348-5351**
Pessana, Franco (FICEN, Favaloro University); Armentano, Ricardo (Favaloro University); Chironi, Gilles (Hôpital Européen Georges Pompidou); Megnien, Jean Louis (Hôpital Européen Georges Pompidou); Mousseaux, Elie (HEGP); Simon, Alain (Hôpital Européen Georges Pompidou)*

SaC03: 13:30-15:00 Grand Ballroom - Salon B
2.3.3 Biomedical Optical Imaging I (Oral Session)
Chair: Atam Dhawan, *New Jersey Inst. of Tech.*
Co-Chair: Jing Bai, *Tsinghua Univ.*

13:30-13:45 SaC03.1
Multispectral Optical Imaging of Skin-Lesions for Detection of Malignant Melanomas **5352-5355**
Dhawan, Atam (New Jersey Institute of Technology); D'Alessandro, Brian (New Jersey Institute of Technology); Patwardhan, Sachin (Washington University/Medicine)*

SaC05: 13:30-15:00 Marquette V
2.9.1 Functional Biomedical Imaging (Oral Session)
Chair: Hae-Jeong Park, *Yonsei Univ.*
Co-Chair: Stephen LaConte, *Baylor Coll. of Medicine*

14:45-15:00 SaC05.6

Fmri Activation Pattern Recognition: A Novel Application of PCA in Language Network of Pediatric Localization Related Epilepsy **5397-5400**

You, Xiaozhen (Florida International University); Guillen, Magno (Florida International University); Bernal, Byron (Miami Children's Hospital); Gaillard, William (Children's National Medical Center); Adjouadi, Malek (Florida International University)*

SaC06: 13:30-15:00 Conrad A

3.5.2 Wireless Sensors (Oral Session)

Chair: Sameer Sonkusale, *Tufts Univ.*

Co-Chair: Bruce Towe, *Arizona Sate Univ.*

13:30-13:45 SaC06.1

Near-Field Wireless Magnetic Link for an Ingestible Cattle Health Monitoring Pill **5401-5404**

Hoskins, Seth (Kansas State University); Sobering, Timothy (Kansas State University); Andresen, Daniel (Kansas State University); Warren, Steve (Kansas State University)*

13:45-14:00 SaC06.2

Ambulatory Device for Urinary Incontinence Detection in Females **5405-5408**

Dan, Wang (University of Minnesota); Timm, Gerald W. (University of Minnesota); Erdman, Arthur (University of Minnesota); Tewfik, Ahmed (University of Minnesota)*

14:00-14:15 SaC06.3

An Integrated Circuit for Wireless Ambulatory Arrhythmia Monitoring Systems **5409-5412**

Kim, Hyejung (KAIST); Yazicioglu, Refet Firat (IMEC); Torfs, Tom (IMEC); Merken, Patrick (IMEC); Van Hoof, Chris (IMEC); Yoo, Hoi-Jun (KAIST)*

14:15-14:30 SaC06.4

A Small, Light-Weight, Low-Power, Multichannel Wireless Neural Recording Microsystem **5413-5416**

Borna, Amir (Graduate Student Research Assistant); Marzullo, Timothy (University of Michigan); Gage, Gregory J. (Univerisity of Michigan); Najafi, Khalil (University of Michigan)*

14:30-14:45 SaC06.5

An Accuracy Aware Low Power Wireless EEG Unit with Information Content Based Adaptive Data Compression **5417-5420**

Tolbert, Jeremy (Georgia Institute of Technology); Kabali, Pratik (Georgia Institute of Technology); Brar, simeranjit (Georgia Institute of Technology); Mukhopadhyay, Saibal (Georgia Institute of Technology)*

14:45-15:00 SaC06.6

Wireless Ultrasound-Powered Biotelemetry for Implants **5421-5424**

Towe, Bruce (Arizona Sate University); Larson, Patrick (Arizona State University); Gulick, Daniel (Arizona State University)*

SaC07: 13:30-15:00 Marquette VII

3.10.2 Magnetic Sensors (Oral Session)

Chair: Jian-Ping Wang, *Univ. of Minnesota*

Co-Chair: Keat Ghee Ong, *Michigan Tech. Univ.*

13:30-13:45 SaC07.1

Evolution of a Magnetic-Based Biomolecular Detection System **5425-5427**

Tamanaha, Cy (Naval Research Laboratory); Mulvaney, Shawn P. (Naval Research Laboratory); Rife, Jack (Naval Research Laboratory)*

13:45-14:00 SaC07.2

Microfluidic Package Design for Magnetoresistive Biosensors **5428-5431**

Tondra, Mark (Diagnostic Biosensors, LLC); Bardell, Ron (Microplumbers Microsciences LLC); Datta, Proyag (Louisiana State University)*

SaC08: 13:30-15:00 Marquette VIII
4.5.1 Current Progress in Modeling Regulatory, Metabolic, and Proteomic Networks (Oral Session)
Chair: Edmund Crampin, *University of Auckland*
Co-Chair: Jason Papin, *University of Virginia*

SaC09: 13:30-15:00 Marquette II

5.4.2 Cardiovascular Pulmonary Regulation (Neurohumoral, HRV) (Oral Session)

Chair: Nicolas Chbat, *Philips Res. North America*

Co-Chair: Chi-Sang Poon, *Massachusetts Inst. of Tech.*

13:30-13:45 SaC09.1

Modeling Cerebral Blood Flow and Regulation 5470-5473

Aoi, Mikio (North Carolina State University); Gremaud, Pierre (North Carolina State University); Tran, Hien (Department of Mathematics, North Carolina State University); Novak, Vera (Beth Isreal Deaconess Medical Center/Harvard Medical School); Olufsen, Mette (North Carolina State University)*

13:45-14:00 SaC09.2

A Comprehensive Cardiopulmonary Simulation Model for the Analysis of Hypercapnic Respiratory Failure 5474-5477

Chbat, Nicolas (Philips Research North America); Giannessi, Massimo (University of Bologna); Albanese, Antonio (University of Bologna); Ursino, Mauro (University of Bologna)*

14:00-14:15 SaC09.3

Electrode Structures for Acquisition and Neural Stimulation Controlling the Cardiovascular System 5478-5481

Steltenkamp, Siegfried (Fraunhofer Institut - IBMT); Becher, Kai (Fraunhofer IBMT); Doerge, Thomas (Fraunhofer Institute for Biomedical Engineering); Ruff, Roman (Fraunhofer Institut für Biomedizinische Technik); Hoffmann, Klaus-Peter (Fraunhofer Institut)*

14:15-14:30 SaC09.4

One-Dimensional Modelling of Pulse Wave Propagation in Human Airway Bifurcations in Space-Time Variables 5482-5485

Clavica, Francesco (Brunel University); Alastruey, Jordi (Imperial College London); Sherwin, Spencer (Imperial college London); Khir, Ashraf (Brunel University)*

14:30-14:45 SaC09.5

Induced Respiratory System Modeling by High Frequency Chest Compression Using Lumped System Identification Method 5486-5489

Lee, Jongwon (UNIVERSITY OF MINNESOTA); Lee, Yong Wan (University of Minnesota); O'Clock, George (University of Minnesota); Zhu, Xiaoming (University of Minnesota); Parhi, Keshab (University of Minnesota); Warwick, Warren J. (University of Minnesota)*

14:45-15:00 SaC09.6

Pulse Rate Analysis in Case of Central Sleep Apnea: A New Algorithm for Cardiac Rate Estimation 5490-5493

NGUYEN, Quang Vinh (École Nationale Supérieure des Sciences Appliquées et de); LE PAGE, Ronan (École Nationale Supérieure des Sciences Appliquées et de Technologie (ENSSAT)); GOUJON, Jean-Marc (École Nationale Supérieure des Sciences Appliquées et de Technologie (ENSSAT)); GUYADER, Patrick (École Nationale Supérieure des Sciences Appliquées et de Technologie (ENSSAT)); BILLON, Michel (École Nationale Supérieure des Sciences Appliquées et de Technologie (ENSSAT))*

SaC10: 13:30-15:00 Grand Ballroom - Salon C

6.4.1 Brain-Machine Interface I (Oral Session)

Chair: Daniel Moran, *Washington University in St. Louis*

Co-Chair: Jose M. Carmena, *Univ. of California, Berkeley*

13:30-13:45 SaC10.1

An Implantable Bi-Directional Brain-Machine Interface System for Chronic Neuroprosthesis Research 5494-5497

Stanslaski, Scott (Medtronic); cong, peng (Medtronic); Carlson, David (Medtronic); santa, wesley (Medtronic); Jensen, Randy (Medtronic); Molnar, Greg (Medtronic); Marks, William (Univ Ca Sf Sch Of Med); Shafquat, Afsah (Medtronic); Denison, Timothy (Medtronic)*

13:45-14:00 SaC10.2

Effective Brain-Computer Interfacing Using BCI2000 5498-5501

Schalk, Gerwin (Wadsworth Center, New York State Department of Health)*

SaC11: 13:30-15:00 Marquette I
6.2.1 Neural Microsystems I (Oral Session)
Chair: Patrick Wolf, *Duke University*
Co-Chair: Maysam Ghovanloo, *Georgia Inst. of Tech.*

SaC12: 13:30-15:00 Marquette VI
1.4.5 Biomedical Signal Classification IV (Oral Session)
Chair: Khosrow Behbehani, *Univ. of Texas at Arlington*
Co-Chair: Maria G. Signorini, *Pol. di Milano*

13:30-13:45 SaC12.1
A Continuous Evaluation of the Awake Sleep State Using Fuzzy Reasoning **5539-5542**
Fernandez-Pastoriza, Jose Maria (University of A Coruña); Álvarez-Estévez, Diego (University of A Coruña); Moret-Bonillo, Vicente (A Coruña University)*

13:45-14:00 SaC12.2
A New Measure to Quantify Sleepiness Using Higher Order Statistical Analysis of EEG **5543-5546**
Abeyratne, Udantha R (University of Queensland); Swarnkar, Vinayak (University of Queensland); Hukins, Craig (Prince Alexandra Hospital)*

14:00-14:15 SaC12.3
A Classification Algorithm Based on Spectral Features from Nocturnal Oximetry and Support Vector Machines to Assist in the Diagnosis of Obstructive Sleep Apnea **5547-5550**
Marcos, J. Victor (University of Valladolid, CIF: Q4718001C); Hornero, Roberto (University Of Valladolid); Álvarez, Daniel (University of Valladolid); del Campo, Félix (Hospital del Río Hortega); Zamarrón, Carlos (Hospital Clínico Universitario)*

14:15-14:30 SaC12.4
Normal Probability Testing of Snore Signals for Diagnosis of Obstructive Sleep Apnea **5551-5554**
Ghaemmaghami, Houman (The University of Queensland); Abeyratne, Udantha R (University of Queensland); Hukins, Craig (Prince Alexandra Hospital)*

14:30-14:45 SaC12.5
Automatic Detection of Sleep Macrostructure Based on Bed Sensors **5555-5558**
Mendez, Martin Oswaldo (politecnico di Milano); Matteucci, Matteo (Politecnico di Milano); Cerutti, Sergio (Politecnico di Milano); Bianchi, Anna Maria (Politecnico di Milano); Kortelainen, Juha Matti (VTT)*

14:45-15:00 SaC12.6
Detection of Obstructive Sleep Apnea in ECG Recordings Using Time-Frequency Distributions and Dynamic Features **5559-5562**
Quiceno-Manrique, Andrés Felipe (Universidad Nacional de Colombia, Sede Manizales); Alonso-Hernández, Jesús Bernardino (Universidad de Las Palmas de Gran Canaria); Travieso-González, Carlos (Universidad de Las Palmas de Gran Canaria); Ferrer-Ballester, Miguel Ángel (Universidad de Las Palmas de Gran Canaria); Castellanos-Dominguez, Germán (Universidad Nacional de Colombia)*

SaC13: 13:30-15:00 Conrad D
8.3.2 Robotic and Image-Guided Surgery I (Oral Session)
Chair: Cameron Riviere, *Carnegie Mellon Univ.*

13:30-13:45 SaC13.1
Patient Motion Tracking in the Presence of Measurement Errors **5563-5566**
Haidegger, Tamas (Budapest University of Technology and Economics/Dept. of Control Engineering and Information Technology (BME - IIT)); Benyo, Zoltan (Budapest Univ of Tech & Economics); Kazanzides, Peter (Johns Hopkins University)*

13:45-14:00 SaC13.2
Catheter Localization in the Left Atrium Using an Outdated Anatomic Reference for Guidance **5567-5570**
Koolwal, Aditya (Stanford University); Barbagli, Federico (Stanford University); Carlson, Christopher (Hansen Medical, Inc.); Liang, David (Stanford University)*

14:00-14:15 SaC13.3
Comparison of Visual Tracking Algorithms on in Vivo Sequences for Robot-Assisted Flexible Endoscopic Surgery **5571-5576**
Masson, Norbert (University of Strasbourg); Nageotte, Florent (University of Strasbourg); Zanne, Philippe (University of Strasbourg); Marescaux, jacques (IRCAD); de Mathelin, Michel (University of Strasbourg)*

14:15-14:30 SaC13.4
Design of a Telemanipulated System for Transluminal Surgery **5577-5582**
Bardou, Berengere (University of Strasbourg); Nageotte, Florent (University of Strasbourg); Zanne, Philippe (University of Strasbourg); de Mathelin, Michel (University of Strasbourg)*

14:30-14:45 SaC13.5
Hybrid Attitude Estimation for Laparoscopic Surgical Tools: A Preliminary Study **5583-5586**
REN, Hongliang (The Johns Hopkins University); Kazanzides, Peter (Johns Hopkins University)*

14:45-15:00 SaC13.6
Active Guidance for Laser Retinal Surgery with a Handheld Instrument **5587-5590**
RoblesValdivieso, Cristina (Carnegie Mellon University); Becker, Brian (Carnegie Mellon University); Biswas, Joydeep (Carnegie Mellon University); Lobes, Louis A. (University of Pittsburgh Medical Center); Riviere, Cameron (Carnegie Mellon University)*

SaC14: 13:30-15:00 Marquette III
9.5.1 Medical Device Design and Human Factors (Oral Session)
Chair: Mary Beth Privitera, *University of Cincinnati*
Co-Chair: Robert Hitchcock, *University of Utah*

13:30-13:45 SaC14.1
Medical Device Development **5591-5594**
Panescu, Dorin (NewCardio, Inc.)*

13:45-14:00 SaC14.2
Interconnections of Basic Science Research and Product Development in Medical Device Design **5595-5598**
Privitera, Mary Beth (University of Cincinnati)*

14:00-14:15 SaC14.3
Opportunity is Hidden in Plain Sight **5599-5601**
Johnson, Royce (Kinetic Concepts, Inc.)*

14:15-14:30 SaC14.4
Towards Sustainable Design for Single-Use Medical Devices **5602-5605**
Hanson, Jacob Joseph (University of Utah); Hitchcock, Robert (University of Utah)*

14:30-14:45 SaC14.5
Applied Ergonomics: Determining User Needs in Medical Device Design **5606-5608**
Privitera, Mary Beth (University of Cincinnati)*

14:45-15:00 SaC14.6
Medical Device Design Process **5609-5612**
Gilman, Byron (Galvani, Ltd.); Brewer, James (Galvani, Ltd.); Kroll, Mark (University of Minnesota)*

SaC15: 13:30-15:00 Marquette IX
10.5.3 Data Mining, Knowledge Discovery, Personalized Decision Support (Oral Session)
Chair: Dimitrios I. Fotiadis, *Univ. of Ioannina*
Co-Chair: Ronald Summers, *Loughborough Univ.*

13:30-13:45 SaC15.1
Semantic Subgroup Discovery: Using Ontologies in Microarray Data Analysis **5613-5616**
Lavrac, Nada (Jozef Stefan Institute); Kralj Novak, Petra (Jozef Stefan Institute); Mozetic, Igor (Jozef Stefan Institute); Podpecan, Vid (Jozef Stefan Institute); Motaln, Helena (National Institute of Biology); Petek, Marko (National Institute of Biology); Gruden, Kristina (National Institute of Biology)*

13:45-14:00 SaC15.2
Neighborhood Graph and Learning Discriminative Distance Functions for Clinical Decision Support **5617-5620**
Tsymbal, Alexey (Siemens AG); Huber, Martin (Siemens AG); Zhou, Shaohua Kevin (Siemens Corporate Research)*

SaC17: 13:30-15:00 Directors Row 4
SS 6. Women in Biomedical Engineering and Health Informatics: Careers, Diversity and Trends (Special Session)
Chair: Carolyn McGregor, *Univ. of Ontario Inst. of Tech*
Co-Chair: Monique Frize, *Carleton Univ.*

SaC18: 13:30-15:00 Marquette IV
2.7.1 Biomedical Image Analysis (Oral Session)
Chair: Ioannis Kakadiaris, *Univ. of Houston*
Co-Chair: Shishir Shah, *Univ. of Houston*

SaDPo01: 15:00-16:40 Grand Ballroom - Salon E, F, G
1.5.3 Principal Component Analysis (Poster Session)

15:00-16:40 SaDPo01.1
3D Point Correspondence by Minimum Description Length with 2DPCA **5657-5660**
Chen, Jiun-Hung (University of Washington); Shapiro, Linda G. (University of Washington)*

15:00-16:40 SaDPo01.2
Characterisation of Arteriovenous Fistula's Sound Recordings Using Principal Component Analysis **5661-5664**
Munguia M., Marco (National University of Engineering); Vásquez, Pablo (Lunds University); Mandersson, Bengt (Lund University)*

15:00-16:40 SaDPo01.3
TFR-Based Feature Extraction Using PCA Approaches for Iscrimination of Heart Murmurs **5665-5668**
Avendaño-Valencia, Luis David (Universidad Nacional de Colombia); Martínez-Tabares, Fernando (Universidad Nacional de Colombia, Sede Manizales); Acosta-Medina, Carlos Daniel (Universidad Nacional de Colombia); Godino-Llorente, Juan Ignacio (Universidad Politécnica de Madrid); Castellanos-Dominguez, Germán (Universidad Nacional de Colombia)*

15:00-16:40 SaDPo01.4
Fast PCA Via UTV Decomposition and Application on EEG Analysis **5669-5672**
Wongsawat, Yodchanan (Mahidol University)*

15:00-16:40 SaDPo01.5
Assessment of the Effects of Subthalamic Stimulation in Parkinson Disease Patients by Artificial Neural Network **5673-5676**
Muniz, Adriane Mara de Souza (Federal University of Rio de Janeiro); Liu, Wen (University of Kansas Medical Center); Liu, Hongzeng (University of Missouri-Kansas City); Lyons, Kelly E. (University of Kansas Medical Center); Pahwa, Rajesh (University of Kansas Medical Center); Nobre, Flavio Fonseca (Federal University of Rio de Janeiro); Nadal, Jurandir (Federal University of Rio de Janeiro)*

15:00-16:40 SaDPo01.6
Performance Evaluation of a Three-axial Accelerometry-based Respiration Monitoring for Ambient Assisted Living **5677-5680**
Jin, Anmin (Eindhoven University of Technology); Yin, Bin (Philips Research); Morren, Geert (Philips); Duric, Haris (Philips Research); Aarts, Ronald M. (Philips)*

SaDPo02: 15:00-16:40 Grand Ballroom - Salon E, F, G
1.6.2 Biomedical Adaptive Filtering II (Poster Session)

15:00-16:40 SaDPo02.1
Real-Time Estimation of the ECG-Derived Respiration (EDR) Signal Using a New Algorithm for Baseline Wander Noise Removal **5681-5684**
Poigai Arunachalam, Shivaram (South Dakota State University); Brown, Lewis (South Dakota State University)*

15:00-16:40 SaDPo02.2
Detection of Respiratory Rhythm from Photoplethysmographic Signal by Adaptive Morphological Filter **5685-5688**
Li, Jin (Xi'an Jiaotong University); Jin, Jie (Xi'an Jiaotong University); Sun, Weixin (Xi'an Jiaotong University)*

15:00-16:40 SaDPo02.3
Automated Beat Onset and Peak Detection Algorithm for Field-Collected Photoplethysmograms **5689-5692**
Chen, Liangyou (US Army Med Research & Matl Cmd); Reisner, Andrew (Massachusetts General Hospital); Reifman, Jaques (U.S. Army Medical Research)*

15:00-16:40 SaDPo02.4
Adjustment of Adaptive Sum Comb Filter for PPG Signals **5693-5696**
Pilt, Kristjan (Technical University of Tallinn); Meigas, Kalju (Tallinn University of Technology); Ferenets, Rain (Tallinn University of Technology); Kaik, Jüri (Tallinn University of Technology)*

SaDPo03: 15:00-16:40 Grand Ballroom - Salon E, F, G
2.6.2 Biomedical Image Reconstruction and Visualization (Poster Session)

SaDPo04: 15:00-16:40 Grand Ballroom - Salon E, F, G
2.7.7 Image Registration, Segmentation and Fusion (Poster Session)

15:00-16:40 SaDPo04.8
Shape-Aided Kidney Extraction in MR Urography **5781-5784**
Yang, Tang (University of Southern California, childrens hospital los angeles); Hollie, Jackson (University of Southern California and Keck School of Medicine, childrens hospital los angeles); susan, lee (University of Southern California and Keck School ofMedicine, childrens hospital los angeles); Nelson, Marvin (University of Southern California and Keck School of Medicine, childrens hospital los angeles); moats, rex (University of Southern California and Keck School ofMedicine, childrens hospital los angeles)*

15:00-16:40 SaDPo04.9
Quantitative Comparison of Segmentation Methods for In-Body Images **5785-5788**
Riaz, Farhan (Universidade do Porto); Coimbra, Miguel (Instituto de Telecomunicações / Universidade do Porto); Ribeiro, Mario Dinis (Universidade do Porto)*

15:00-16:40 SaDPo04.10
Variability in Human and Automatic Segmentation of Melanocytic Lesions **5789-5792**
Silletti, Alberto (University of Padova); Peserico, Enoch (University of Padova); Mantovan, Alessandra (University of Padova); Zattra, Edoardo (University of Padova); Peserico, Andrea (University of Padova); Belloni Fortina, Anna (University of Padova)*

15:00-16:40 SaDPo04.11
Non-Rigid Image Registration Using Local Histogram-Based Features **5793-5796**
luo, yishan (the hong kong university of science and technology); Chung, Albert C. S. (The Hong Kong Univ of Sci & Tech)*

15:00-16:40 SaDPo04.12
Multi-Structure Whole Brain Registration and Population Average **5797-5800**
Khan, Ali R. (Simon Fraser University); Beg, Mirza Faisal (Simon Fraser University)*

15:00-16:40 SaDPo04.13
Multi-Image Registration for Evaluating the 99mTc-TRODAT-1 of Parkinson's Rat Model **5801-5804**
Lee, Jiann-Der (Chang Gung University)*

15:00-16:40 SaDPo04.14
Automated PET/CT Brain Registration for Accurate Attenuation Correction **5805-5808**
Khurshid, Khawar (Michigan State University); McGough, Robert (Michigan State University); Berger, Kevin (Michigan State University)*

15:00-16:40 SaDPo04.15
Estimation of Anatomical Locations Using Standard Frame of Reference in Chest CT Scans **5809-5812**
Lee, Jaesung (Cornell University); Biancardi, Alberto (Cornell University); Reeves, Anthony (Cornell University); Yankelevitz, David (Weill Cornell Medical College); Henschke, Claudia (Weill Cornell Medical College)*

15:00-16:40 SaDPo04.16
Medical Image Fusion Scheme Using Complex Contourlet Transform Based on PCA **5813-5816**
Al-Azzawi, Nemir (Universiti sains Malaysia); Mat Sakim, Harsa Amylia (University Sains Malaysia); Wan Abdullah, Wan Ahmad Kamil (Universiti Sains Malaysia); Ibrahim, Haidi (Universiti Sains Malaysia)*

15:00-16:40 SaDPo04.17
An Anatomical Mouse Model for Multimodal Molecular Imaging **5817-5820**
Zhang, Xing (Institute of Automation, Chinese Academy of Sciences); Tian, Jie (Chinese Academy of Sciences); Feng, Jinchao (Beijing University of Technology); Zhu, Shouping (Institute of Automation, Chinese Academy of Sciences); Yan, Guorui (Chinese Academy of Science)*

15:00-16:40 SaDPo04.18
A New Multi-Modal Similarity Measure for Fast Gradient-Based 2D-3D Image Registration **5821-5824**
Pickering, Mark (The University of New South Wales); Abdullah Al, Muhit (The University of New South Wales); Scarvell, Jennie (The Canberra Hospital); Smith, Paul (The Canberra Hospital)*

15:00-16:40 SaDPo04.19
Parallel Registration of Multi-Modal Medical Image Triples Having Unknown Inter-Image Geometry **5825-5828**
Papp, Laszlo (Research Unit of Medical Image Processing); Zsoter, Norbert (Mediso Medical Imaging Systems); Szabo, Gergely (Mediso Medical Imaging Systems); Bejan, Csaba (Mediso Medical Imaging Systems); Szimjanovszki, Emil (Mediso Medical Imaging Systems); Henze, Eberhard (UK-SH Campus Kiel, Germany)*

SaDPo07: 15:00-16:40 Grand Ballroom - Salon E, F, G
4.6.2 Biomedical Data Management and Tools for Bioinformatics (Poster Session)

15:00-16:40 SaDPo07.6

Combining Sea Urchin Embryo Cell Lineages by Error-Tolerant Graph Matching **5918-5921**

Rubio-Guivernau, Jose Luis (Universidad Politécnica de Madrid); Luengo-Oroz, Miguel Angel (Universidad Politécnica de Madrid); Duloquin, Louise (CNRS); Savy, Thierry (Ecole Polytechnique); Peyrieras, Nadine (CNRS); Bourgine, Paul (Ecole Polytechnique); Santos, Andres (Universidad Politecnica Madrid)*

SaDPo08: 15:00-16:40 Grand Ballroom - Salon E, F, G

6.8.2 Learning and Adaption in Neuromuscular Systems (Poster Session)

15:00-16:40 SaDPo08.1

Multiple Interactions between Hemispheres of the Brain Modulating Coupling of Bilateral Movements **5922-5925**

Sakurada, Takeshi (Tokyo Institute of Technology); Gomi, Hiroaki (Nippon Telegraph and Telephone); ito, koji (Tokyo Institute of Technology)*

15:00-16:40 SaDPo08.2

Influence of Motor Imagery on Learning under Complex External Dynamics **5926-5929**

Anwar, Muhammad Nabeel (Tokyo Institute of Technology); Tomi, Naoki (Tokyo Institute of Technology); ito, koji (Tokyo Institute of Technology)*

15:00-16:40 SaDPo08.3

Brain Biomarkers of Motor Adaptation Using Phase Synchronization **5930-5933**

Gentili, Rodolphe (University of Maryland); Bradberry, Trent (University of Maryland); Hatfield, Bradley (University of Maryland); Contreras-Vidal, José (University of Maryland)*

15:00-16:40 SaDPo08.4

Reach to Grasp Kinematics and EMG Analysis of C6 Quadriplegic Subjects **5934-5937**

Jacquier-Bret, Julien (Université du Sud - Toulon - Var); Rezzoug, Nasser (Université du Sud Toulon-Var); Vallier, Jean-Marc (Université du Sud Toulon Var); Tournebise, Hubert (Hopital Renée Sabran); Gorce, Philippe (Université du Sud Toulon Var)*

15:00-16:40 SaDPo08.5

Effects of Environmental Instabilities on Endpoint Stiffness During the Maintenance of Human Arm Posture **5938-5941**

Krutky, Matthew (Northwestern University); Trumbower, Randy (Northwestern University); Perreault, Eric (Northwestern University)*

SaDPo09: 15:00-16:40 Grand Ballroom - Salon E, F, G

6.9.1 Neural Trauma and Regeneration (Poster Session)

15:00-16:40 SaDPo09.1

Developmental Effects of Low Frequency Magnetic Fields on P19-Derived Neuronal Cells **5942-5945**

Saito, Atsushi (University of Tokyo); Takayama, Yuzo (University of Tokyo); Moriguchi, Hiroyuki (University of Tokyo); Kotani, Kiyoshi (University of Tokyo); Jimbo, Yasuhiko (University of Tokyo)*

15:00-16:40 SaDPo09.2

Neural Signals in Cortex and Thalamus During Brain Injury from Cardiac Arrest in Rats **5946-5949**

Zhang, Dandan (Tsinghua University); Choi, Young-Seok (Johns Hopkins University School of medicine); Madhok, Jai (Johns Hopkins School of Medicine); Jia, Xiaofeng (Johns Hopkins School of Medicine); Koenig, Matthew (Johns Hopkins School of Medicine); Thakor, Nitish (Johns Hopkins University)*

15:00-16:40 SaDPo09.3

Microfluidic in Vivo Screen Identifies Compounds Enhancing Neural Regeneration **5950-5952**

Rohde, Christopher (Massachusetts Institute of Technology); Gilleland, Cody (Massachusetts Institute of Technology); Samara, Chrysanthi (MIT); Yanik, Mehmet Fatih (MIT)*

15:00-16:40 SaDPo09.4

Neural Signal Sensing, Transmission and Functional Regeneration on Different Toads' Bodies **5953-5956**

SHEN, Xiaoyan (Southeast University); Wang, Zhigong (Southeast University); Lü, Xiaoying (Southeast University); Jiang, Zhenglin (Nantong University); Li, Wenyuan (Southeast University); ZHAO, Xintai (Southeast University); HUANG, Zonghao (Southeast University)*

SaDPo10: 15:00-16:40 Grand Ballroom - Salon E, F, G
6.10.3 Robotics in Rehabilitation II (Poster Session)

15:00-16:40 SaDPo10.1
Design of an Exoskeleton for Index Finger Rehabilitation **5957-5960**
Wang, Ju (Beihang University); Li, Jiting (Beihang University); Zhang, Yuru (Beihang University); Wang, Shuang (Beihang University)*

15:00-16:40 SaDPo10.2
Training Stroke Patients with Continuous Tracking Movements: Evaluating the Improvement of Voluntary Control **5961-5964**
casadio, maura (Northwestern University); Giannoni, Psiche (ART Education and Rehabilitation Department srl); Morasso, Pietro (University of Genova); Sanguineti, Vittorio (University of Genoa); Squeri, Valentina (University of Genova); Vergaro, Elena (University of Genoa)*

15:00-16:40 SaDPo10.3
Development and Feasibility Study of a Sensory-Enhanced Robot-Aided Motor Training in Stroke Rehabilitation **5965-5968**
Liu, Wen (University of Kansas Medical Center)*

15:00-16:40 SaDPo10.4
Development of a Skin for Intuitive Interaction with an Assistive Robot **5969-5972**
Markham, Heather (University of Pittsburgh); Brewer, Bambi (Univ of Pittsburgh)*

15:00-16:40 SaDPo10.5
Development of an Interactive Upper Extremity Gestural Robotic Feedback System: From Bench to Reality **5973-5976**
Coleman Wood, Krista (Mayo Clinic Rochester); Lathan, Corinna (AnthroTronix, Inc.); Kaufman, Kenton (Mayo Clinic)*

15:00-16:40 SaDPo10.6
Kinematic Walking Analysis on a New Vehicle "Tread-Walk" with Active Velocity Control of Treadmill Belt **5977-5980**
Ando, Takeshi (Waseda University); Nihei, Misato (University of Tokyo); Ohki, Eiichi (Waseda University); Nakashima, YASUTAKA (Waseda University); Kobayashi, Yo (Waseda University); Fujie, Masakatsu G. (Waseda University)*

15:00-16:40 SaDPo10.7
A Clinical Study of Motor Imagery Brain-Computer Interface-Based Upper Limb Robotic Rehabilitation for Stroke **5981-5984**
Ang, Kai Keng (Institute for Infocomm Research); Guan, Cuntai (Institute for Infocomm Research); Chua, Karen Sui Geok (Tan Tock Seng Hospital Rehabilitation Centre); Ang, Beng Ti (National Neuroscience Institute); Kuah, Christopher Wee Keong (Tan Tock Seng Hospital Rehabilitation Centre); Wang, Chuanchu (Institute for Infocomm Research); Phua, Koksoon (Institute for Infocomm Research); Chin, Zheng Yang (Institute for Infocomm Research, Agency for Science Technology and Research); Zhang, Haihong (Institute for Infocomm Research)*

SaDPo11: 15:00-16:40 Grand Ballroom - Salon E, F, G
7.2.2 Cellular and Tissue Engineering, and Biomaterials (Poster Session)

15:00-16:40 SaDPo11.1
Engineering Analysis and Development of the Spheroid Reservoir Bioartificial Liver **5985-5988**
McIntosh, Malcolm (Mayo Clinic); Corner, Stephen (Mayo Clinic); Amiot, Bruce (Brami Biomedical, Inc.); Nyberg, Scott (Mayo Clinic)*

15:00-16:40 SaDPo11.2
Modeling Bimodal Vessel Effects on Radio and Microwave Frequency Ablation Zones **5989-5992**
Brannan, Joseph (Covidien, Energy-based Devices); Ladtkow, Casey (Covidien, Energy-based Devices)*

15:00-16:40 SaDPo11.3
Ensemble Stimulation of Embryoid Bodies Using Microfabricated ITO Substrates **5993-5996**
Takayama, Yuzo (University of Tokyo); Moriguchi, Hiroyuki (University of Tokyo); Saito, Atsushi (University of Tokyo); Kotani, Kiyoshi (University of Tokyo); Jimbo, Yasuhiko (University of Tokyo)*

15:00-16:40 SaDPo11.15
Measuring the Mechanical Properties of Cells Using Acoustic Microscopy **6042-6045**
Strohm, Eric (Ryerson University); Kolios, Michael (Ryerson University)*

15:00-16:40 SaDPo11.16
A Carbon Nanotube Gas Sensor Fabricated by Dielectrophoresis and Its Application for NH3 Detection **6046-6049**
Wang, Renhui (Zhejiang University); Li, Hongtao (Zhejiang University); Pan, Min (Zhejiang University)*

SaDPo12: 15:00-16:40 Grand Ballroom - Salon E, F, G
8.4.3 Human-Robot Interaction III (Poster Session)

15:00-16:40 SaDPo12.1
The Chewing Robot: A New Biologically-Inspired Way to Evaluate Dental Restorative Materials **6050-6053**
Raabe, Daniel (University of Bristol); Alemzadeh, Kazem (University of Bristol); Harrison, Andrew Joseph Lawrence (University of Bristol); Ireland, Anthony John (Bristol Dental Hospital)*

15:00-16:40 SaDPo12.2
Design and Implementation of Series Elastic Actuators for a Haptic Laparoscopic Device **6054-6057**
Basafa, Ehsan (Johns Hopkins University); Sheikholeslami, Majid (McGill University); Mirbagheri, Alireza (Research Center for Science and Technology In Medicine); Vossoughi, Gholamreza (Sharif University of Technology); Farahmand, Farzam (Sharif University of Technology)*

15:00-16:40 SaDPo12.3
A Study of the Effect of the Femoral Head Diameter on Prosthetic Hip Dislocation Using a Hip-Joint Motion Simulator **6058-6061**
Kiguchi, Kazuo (Saga University); Horie, Toru (Saga University); Yamashita, Akira (Saga University); Ueno, Masaru (Japan Medical Materials Corporation); kobayashi, Tsuneyuki (Japan Medical Materials Corporation); Mawatari, Masaaki (Saga University); Hotokebuchi, Takao (Saga University)*

15:00-16:40 SaDPo12.4
Capacitor Regenerative Braking System of Electric Wheelchair for Senior Citizen Based on Variable Frequency Chopper Control **6062-6067**
Takahashi, Yoshiaki (Chiba Institude of Technology); Seki, Hirokazu (Chiba Institute of Technology)*

15:00-16:40 SaDPo12.5
Magnetic Navigation of an Untethered Micro Device Using Four Stationary Coils **6068-6071**
Ha, Yong Hyun (Kyung Hee University); Choi, Kyung Moo (Kyung Hee University); Han, Byung Hee (Kyung Hee University); Cho, Min Hyoung (Kyung Hee University); Lee, Soo Yeol (Kyung Hee University)*

15:00-16:40 SaDPo12.6
MRI Compatibility Evaluation of a Piezoelectric Actuator System for a Neural Interventional Robot **6072-6075**
WANG, YI (Worcester Polytechnic Institute); Cole, Gregory (Worcester Polytechnic Institute); Su, Hao (Worcester Polytechnic Institute); Pilitsis, Julie (Umass Memorial Medical Center); Fischer, Gregory (Worcester Polytechnic Institute)*

15:00-16:40 SaDPo12.7
Improvement of Locomotive Performance of Capsular Microrobot Moving in GI Tract Using Position Based Feedback Control **6076-6079**
Park, Kitae (University of Science & Technology, Korea); Yang, Sungwook (Korear Inst of Science & Technology); Kim, Jinseok (Korea Institue of Science and Tech); Kim, Tae Song (Korea Institute of Science & Tech); Yoon, Eui-Sung (Korea Institute of Science & Tech)*

SaDPo13: 15:00-16:40 Grand Ballroom - Salon E, F, G
10.4.3 Technologies for Home Care (Poster Session)

15:00-16:40 SaDPo13.1
Development of the Irregular Pulse Detection Method in Daily Life Using Wearable Photoplethysmographic Sensor **6080-6083**
Suzuki, Takuji (Toshiba Corporation); Kameyama, Ken-ichi (Toshiba); Tamura, Toshiyo (Chiba University)*

15:00-16:40 SaDPo13.23
Signal Scavenging for Passive Monitoring in Eldercare Technology **6167-6170**
Tyrer, Harry (University of Missouri - Columbia); Neelgund, Rohan (University of Missouri,Columbia); Mohammed, Ashrafuddin (University of Missouri); Shriniwar, Uday (University)*

15:00-16:40 SaDPo13.24
Home E-Health System Integration in the Smart Home through a Common Media Server **6171-6174**
Pau, Iván (Universidad Politécnica de Madrid); Seoane, Fernando (University College of Borås); Lindecrantz, Kaj (University College of Borås); Valero, Miguel Ángel (Universidad Politécnica de Madrid); Carracedo, Justo (Universidad Politécnica de Madrid)*

15:00-16:40 SaDPo13.25
Dynamic Activity Classification Based on Automatic Adaptation of Postural Orientation **6175-6178**
Song, Sa-kwang (Electronics & Telecommunications Research Institute); Jang, Jaewon (Electronics & Telecom Research Inst); Park, Soo-Jun (Electr & Telecomm Research Inst)*

15:00-16:40 SaDPo13.26
Evaluation of Functional Deficits and Falls Risk in the Elderly – Methods for Preventing Falls **6179-6182**
Narayanan, Michael Ravi (University of New South Wales); Scalzi, Maria Elena (Politecnico di Milano); Redmond, Stephen James (University of New South Wales); Lord, Stephen (University of New South Wales); Celler, Branko George (University of New South Wales); Lovell, Nigel H (University of New South Wales)*

15:00-16:40 SaDPo13.27
Context-Aware Life-Logging for Persons with Mild Dementia **6183-6186**
Kikhia, Basel (Luleå University of Technology); Hallberg, Josef (Luleå University of Technology); Synnes, Kåre (University); ul Hussain Sani, Zaheer (Luleå University of Technology)*

15:00-16:40 SaDPo13.28
Fuzzy Inference Based Non-Daily Behavior Pattern Detection for Elderly People Monitoring System **6187-6192**
Seki, Hirokazu (Chiba Institute of Technology)*

15:00-16:40 SaDPo13.29
Development of Pointing Device Using DC-Coupled Electrooculogram **6193-6196**
Uchitomi, Hirotaka (Niigata University); Hori, Junichi (Niigata University)*

15:00-16:40 SaDPo13.30
Unsupervised Monitoring of Sitting Behavior **6197-6200**
Tessendorf, Bernd (ETH Zurich); Arnrich, Bert (Swiss Federal Institute of Technology Zurich); Schumm, Johannes (ETH Zurich); Setz, Cornelia (ETH Zurich); Troster, Gerhard (ETH Zurich)*

SaDPo14**:** 15:00-16:40 Grand Ballroom - Salon E, F, G
10.5.2 Computer-aided Decision Making II (Poster Session)

15:00-16:40 SaDPo14.1
A Numerical Model to study Auscultation Sounds under Pneumothorax conditions **6201-6204**
Ramakrishnan, Sridhar (Michigan State University); Udpa, Satish (Michigan State University); Udpa, Lalita (Michigan State University)*

15:00-16:40 SaDPo14.2
Practical Considerations for Optic Nerve Location in Telemedicine **6205-6209**
Karnowski, Thomas (Oak Ridge National Laboratory); Aykac, Deniz (Oak Ridge National Laboratory); Chaum, Edward (Univ of Tennessee Hamilton Eye Inst); Giancardo, Luca (University of Burgundy - Oak Ridge National Lab); Li, Yaqin (University of Tennesse Health Science Center); Tobin, Kenneth (Oak Ridge National Laboratory); Abramoff, Michael David (University of Iowa)*

15:00-16:40 SaDPo14.3
Reference-Free Automatic Quality Assessment of Tracheoesophageal Speech **6210-6213**
Huang, Andy (Queen's University); Falk, Tiago (Queen's University); Chan, Wai-Yip (Queen's University); Parsa, Vijay (University of Western Ontario); Doyle, Philip (University of Western Ontario)*

SaE01: 16:40-18:10 Conrad B
1.2.10 Biomedical Signals and Systems I (Oral Session)
Chair: Ozcan Ozdamar, *Univ. of Miami*
Co-Chair: Gian Domenico Pinna, *S. Maugeri Foundation, IRCCS*

16:40-16:55 SaE01.1
Myometrium Electromechanical Modeling for Internal Uterine Pressure Estimation by Electrohysterography **6259-6262**
Rabotti, Chiara (Eindhoven University of Technology); Mischi, Massimo (Eindhoven University of Technology); van Laar, O. E. H. Judith (Veldhoven Maxima Medical Center); Oei, S. Guid (Maxima Medisch Centrum, Veldhoven); Bergmans, Johannes Wilhelmus Maria (Eindhoven University of Technology)*

16:55-17:10 SaE01.2
High Resolution System for Improved Transient-Evoked Otoacoustic Emission Acquisition **6263-6266**
Bennett, Christopher (University of Miami); Ozdamar, Ozcan (University of Miami)*

17:10-17:25 SaE01.3
Rate Estimation for the Monitoring of Rehabilitation Exercises **6267-6270**
WENG, Kaili (UTS); Nguyen, Tuan Nghia (University of Technology, Sydney); Nguyen, Hung T. (University of Technology, Sydney); Su, Steven Weidong (University of Technology, Sydney)*

17:25-17:40 SaE01.4
Evaluating Indices of Age-Related Muscle Performance by Using Surface Electromyography **6271-6275**
Takada, Hiroki (Gifu University of Medical Science); Shiozawa, Tomoki (Aoyama Gakuin University); Takada, Masumi (Aichi Medical University School of Medicine); Iwase, Satoshi (Aichi Medical University School of Medicine); Miyao, Masaru (Nagoya University)*

17:40-17:55 SaE01.5
Relationship between Ventilatory Oscillations and Fractal Dimension of the EEG During Daytime Periodic Breathing in Heart Failure Patients **6276-6279**
Maestri, Roberto (S. Maugeri Foundation, IRCCS); La Rovere, Maria Teresa (S. Maugeri Foundation, IRCCS); Robbi, Elena (S. Maugeri Foundation, IRCCS); Pinna, Gian Domenico (S. Maugeri Foundation, IRCCS)*

17:55-18:10 SaE01.6
Surrogate Data Approaches to Assess the Significance of Directed Coherence: Application to EEG Activity Propagation **6280-6283**
Faes, Luca (University of Trento); Porta, Alberto (Universita' degli Studi di Milano); Nollo, Giandomenico (University of Trento)*

SaE02: 16:40-18:10 Conrad C
1.3.3 Nonlinear Dynamics and Analysis (Oral Session)
Chair: Elena Tolkacheva, *Univ. of Minnesota*
Co-Chair: Yihong Qiu, *Shanghai Jiao Tong Univ.*

16:40-16:55 SaE02.1
Characterising Infant Inter-Breath Interval Patterns During Active and Quiet Sleep Using Recurrence Plot Analysis **6284-6287**
Terrill, Philip Ian (University of Queensland); Wilson, Stephen (University of Queensland); Suresh, Sadasivam (Mater Children's Hospital); Cooper, David (Mater Misericordiae Children's Hospital)*

16:55-17:10 SaE02.2
Changes in Decibel Scale Wavelength Properties of EEG with Alertness Levels While Performing Sustained Attention Tasks **6288-6291**
Poosapadi Arjunan, Sridhar (RMIT University); Kant Kumar, Dinesh (RMIT university); Jung, Tzyy-Ping (University of California San Diego)*

17:10-17:25 SaE02.3
Detecting Complexity Abnormalities in Dyslexia Measuring Approximate Entropy of Electroencephalographic Signals **6292-6295**
Andreadis, Ioannis (Biomedical Simulations ang Imaging Laboratory); Giannakakis, Giorgos (Biomed Simulations & Imaging Lab); Papageorgiou, Charalabos (Eginition Hospital, Medical School, University of Athens); Nikita, Konstantina (National Technical University of Athens)*

17:25-17:40 SaE02.4
Spatial Analysis of Uterine EMG Signals: Evidence of Increased in Synchronization with Term **6296-6299**
HASSAN, Mahmoud (UTC-France); TERRIEN, Jeremy (Reykjavik University); Karlsson, Brynjar (Reykjavik University); Marque, Catherine (University of technology of compiegne)*

17:40-17:55 SaE02.5
Stochastic Resonance in Brain Activity Elicited by Auditory Stimuli **6300-6303**
Tanaka, Keita (Tokyo Denki University); Nemoto, Iku (Tokyo Denki University); Kawakatsu, Masaki (Tokyo Denki University); UCHIKAWA, Yoshinori (Tokyo Denki University)*

SaE03: 16:40-18:10 Grand Ballroom - Salon B
2.3.2 Optical Imaging, Microscopy, and Infrared Imaging II (Oral Session)
Chair: Hao Zhang, *Univ. of Wisconsin-Milwaukee*
Co-Chair: Taner Akkin, *Univ. of Minnesota*

16:40-16:55 SaE03.1
Real-Time Confocal Raman Imaging of a Drug Delivery System on Cardiac Leads **6304-6306**
Dong, Jinping (University of Minnesota); Polkinghorne, Jeannette (Boston Scientific); Heil, Ronald (Boston Scientific); Kemp, Ruth (University of Minnesota)*

16:55-17:10 SaE03.2
Probing Phase Segregation in Porphyrin-Polymer Blends with Multidimensional IR Spectroscopy **6307-6310**
Massari, Aaron (University of Minnesota, Twin Cities); Eigner, Audrey (University of Minnesota, Twin Cities)*

17:10-17:25 SaE03.3
Multiphoton Autofluorescence Microscopy and Second Harmonic Generation Microscopy of Oral Epithelial Neoplasms **6311-6313**
Vargas, Gracie (University of Texas Medical Branch); Shilagard, Tuya (University of Texas Medical Branch); Ho, Ki-Hong (University of Texas Medical Branch); McCammon, Susan (University of Texas Medical Branch)*

17:25-17:40 SaE03.4
Multi-Color Raman Nanotags for Tumor Cell Biomarker Detection **6314-6317**
Nyagilo, James (University of Texas at Arlington); Xiao, Ming (The university of Texas Southwestern Medical Center atDallas); Sun, Xiankai (University of Texas Southwestern Medical Center at Dallas); Dave, Digant (The University of Texas at Arlington)*

17:40-17:55 SaE03.5
Low Coherence Interferometer for Sensing Retardance Change During Neural Activity **6318-6320**
Al-Kaisi, Muhammad (University of Minnesota, Twin Cities); Akkin, Taner (University of Minnesota)*

17:55-18:10 SaE03.6
Optical Mapping of Electrical Heterogeneities in the Heart During Global Ischemia **6321-6324**
Matiukas, Arvydas (SUNY Upstate Medical University); Pertsov, Arkady M. (SUNY Upstate Medical University); KOTHARI, PARTH (University of Minnesota - Twin Cities); Tolkacheva, Elena (University of Minnesota)*

SaE04: 16:40-18:10 Duluth Room
2.10.1 Molecular Imaging (Oral Session)
Chair: Andreas Hielscher, *Columbia Univ.*
Co-Chair: Patrick La Riviere, *The Univ. of Chicago*

16:40-17:10 SaE04.1
Detecting Alterations in Cell Ultrastructure with Optical Imaging **6325-6326**
Backman, Vadim (Northwestern University); Taflove, Allen (Northwestern University)*

17:10-17:25 SaE04.2
Bioluminescence Tomography with CT/MRI Co-Registration **6327-6330**
Klose, Alexander (Columbia University)*

17:25-17:40 SaE04.3
Complete Angle Small Animal Fluorescence Imaging with Early-Arriving Photons **6331-6334**
Niedre, Mark (Northeastern Universtiy); Ntziachristos, Vasilis (Harvard University HMS/MGH)*

17:40-17:55 SaE04.4
Diffuse Optical Tomography & Spectroscopy in Breast Cancer Characterization & Therapy Monitoring at UPENN **6335-6337**
Choe, Regine (University of Pennsylvania)*

17:55-18:10 SaE04.5
On Sensitivity of Molecular Specific Photoacoustic Imaging Using Plasmonic Gold Nanoparticles **6338-6340**
Mallidi, Srivalleesha (University of Texas at Austin); Joshi, Pratixa P. (University of Texas at Austin); Sokolov, Konstantin (The UT M.D. Anderson Cancer Center); Emelianov, Stanislav (University of Texas at Austin)*

SaE05: 16:40-18:10 Marquette V
2.7.6 Biomedical Image Segmentation (Oral Session)
Chair: Jie Tian, *Chinese Acad. of Sciences*
Co-Chair: Steven M. Wright, *Texas A&M Univ.*

16:40-16:55 SaE05.1
GPU Accelerated Fuzzy Connected Image Segmentation by Using CUDA **6341-6344**
Zhuge, Ying (National Cancer Institute, NIH); Cao, Yong (Virginia Polytechnic Institute and State University); Miller, Robert (National Cancer Institute, NIH)*

16:55-17:10 SaE05.2
An Articulated Statistical Shape Model for Accurate Hip Joint Segmentation **6345-6351**
Kainmueller, Dagmar (Zuse Institute Berlin); Lamecker, Hans (INRIA Sophia Antipolis); Zachow, Stefan (Zuse Institute Berlin (ZIB))*

17:10-17:25 SaE05.3
Speckle-Initialized Dynamic Segmentation of the Prostate **6352-6355**
Besseling, René (Eindhoven University of Technology); Zinger, Svitlana (Eindhoven University of Technology); Wijkstra, Hessel (Academic Medical Center, University of Amsterdam); Hendrikx, Ad (Catharina hospital Eindhoven); Mischi, Massimo (Eindhoven University of Technology)*

17:25-17:40 SaE05.4
Spine Curve Modeling for Quantitative Analysis of Spinal Curvature **6356-6359**
Hay, Ori (Tel Aviv University); Rivlin, Ehud (Technion-Israel Institute of Technology); Hershkovitz, Israel (Faculty of Medicine, Tel Aviv University)*

17:40-17:55 SaE05.5
An Automated Method to Detect Interstitial Adipose Tissue in Thigh Muscles for Patients with Osteoarthritis **6360-6363**
Prescott, Jeffrey William (Ohio State University); Priddy, Michael (Ohio State University); Best, Thomas (Ohio State University Medical Center); Pennell, Michael (The Ohio State University Medical Center); Swanson, Mark (OSU); Haq, Furqan (Ohio State University Medical Center); Jackson, Rebecca D (The Ohio State University); Gurcan, Metin (The Ohio State University)*

17:55-18:10 SaE05.6
An Automated Method to Segment the Femur for Osteoarthritis Research **6364-6367**
Prescott, Jeffrey William (Ohio State University); Pennell, Michael (The Ohio State University Medical Center); Best, Thomas (Ohio State University Medical Center); Swanson, Mark (OSU); Haq, Furqan (Ohio State University Medical Center); Jackson, Rebecca D (The Ohio State University); Gurcan, Metin (The Ohio State University)*

SaE06: 16:40-18:10 Conrad A
3.6.1 Nano- and Micro-sensors (Oral Session)
Chair: Samuel Sia, *Columbia Univ.*
Co-Chair: Ilko Ilev, *US FDA*

16:40-16:55 SaE06.1
High-Speed Spinning-Disk Interferometry on the BioCD for Human Diagnostic Applications **6368-6371**
Nolte, David (Purdue University)*

16:55-17:10 SaE06.2
QD Barcodes for Biosensing and Detection **6372-6373**
Gao, Xiaohu (University of Washington)*

17:10-17:25 SaE06.3
Microfluidics Cell Culture with Sensing and SqueezeFluidics **6374-6375**
Takayama, Shuichi (University of Michigan)*

17:25-17:40 SaE06.4
Lensless Imaging for Point-Of-Care Testing **6376-6379**
SangJun, Moon (BWH); Keles, Hasan (Brigham and Woman's Hospital); Yun-Gon, Kim (Brigham and Woman's Hospital); Daniel, Kuritzkes (Brigham and Woman's Hospital); Demirci, Utkan (Harvard-MIT/HST)*

17:40-17:55 SaE06.5
Label-Free Microfluidic Characterization of Temperature-Dependent Biomolecular Binding **6380-6382**
Nguyen, ThaiHuu (Columbia University); Lin, Qiao (Columbia University)*

SaE07: 16:40-18:10 Marquette VII
3.12.1 Implantable Systems (Oral Session)
Chair: Mehmet R. Dokmeci, *Northeastern Univ.*
Co-Chair: Sang hun Lee, *Coll. of Medicine Korea Univ.*

16:40-16:55 SaE07.1
A Preferential Design Approach for Energy-Efficient and Robust Implantable Neural Signal Processing Hardware **6383-6386**
Narasimhan, Seetharam (Case Western Reserve University); Chiel, Hillel (Case Western Reserve University); Bhunia, Swarup (Case Western Reserve University)*

16:55-17:10 SaE07.2
Modeling and Optimization of Printed Spiral Coils in Air and Muscle Tissue Environments **6387-6390**
Jow, Uei-Ming (Georgia Institute of Technology); Ghovanloo, Maysam (Georgia Institute of Technology)*

17:10-17:25 SaE07.3
An Embedded PDMS Nanocomposite Strain Sensor toward Biomedical Applications **6391-6394**
Liu, Chao-Xuan (Louisiana State University); Choi, Jin-Woo (Louisiana State Univeristy)*

17:25-17:40 SaE07.4
Micro Package of Short Term Wireless Implantable Microfabricated Systems **6395-6399**
Bu, Leping (Huazhong University of Science & Technology); cong, peng (Case Western Reserve Univ.); Kuo, Hung-I (Case Western Reserve University); Ye, Xuesong (Zhejiang University); Ko, Wen (Case Western Reserve University)*

17:40-17:55 SaE07.5
Design and Fabrication of Neural Implant with Thick MicroChannels Based on Flexible Polymeric Materials **6400-6403**
Benmerah, Samia (University of Birmingham); Lacour, Stéphanie (University of Cambridge); Tarte, Edward (University of Birmingham)*

17:55-18:10 SaE07.6
Locomotive Micro-Implant with Active Electromagnetic Propulsion **6404-6407**
Pivonka, Daniel (Stanford); Poon, Ada S Y (Stanford University); Meng, Teresa (Stanford University)*

SaE08: 16:40-18:10 Marquette VIII
4.4.1 Advances in Theory and Clinical Applications of Biological Network Studies (Oral Session)
Chair: Ioannis Androulakis, *Rutgers University*
Co-Chair: Qing Nie, *University of California at Irvine*

16:40-16:55 SaE08.1
Multiscale Models for Synthetic Biology **6408-6411**
Kaznessis, Yiannis (University of Minnesota)*

16:55-17:10 SaE08.2
Nonlinear Bionetwork Structure Inference Using the Random Sampling-High Dimensional Model Representation (RS-HDMR) Algorithm **6412-6415**
Miller, Miles (MIT); Feng, Xiaojiang (Princeton University); Li, Genyuan (Princeton University); Rabitz, Herschel (Princeton University)*

SaE09: 16:40-18:10 Marquette II
5.8.1 Cardiovascular Signal Processing and Telemedicine (Oral Session)
Chair: Stanley Finkelstein, *Univ. of Minnesota*
Co-Chair: Jie Lian, *Micro Systems Engineering, Inc.*

SaE10: 16:40-18:10 Grand Ballroom - Salon C
6.4.2 Brain-Machine Interface II (Oral Session)
Chair: Gerwin Schalk, *Wadsworth Center, New York State Department of Health*
Co-Chair: Justin Williams, *Univ. of Wisconsin*

16:40-16:55 SaE10.1
Application of Support Vector Machines to Reliability-Based Automatic Repeat Request for Brain-Computer Interfaces **6457-6460**
Takahashi, Hiromu (Nagoya University); Yoshikawa, Tomohiro (Nagoya University); Furuhashi, Takeshi (Nagoya University)*

16:55-17:10 SaE10.2
A Half-Field Stimulation Pattern for SSVEP-based Brain-computer Interface **6461-6464**
Yan, Zheng (Tsinghua University); Gao, Xiaorong (Tsinghua University); Bin, guangyu (Tsinghua University); Hong, Bo (Tsinghua university); Gao, Shangkai (Tsinghua University)*

17:10-17:25 SaE10.3
Detection of Spontaneous Class-Specific Visual Stimuli with High Temporal Accuracy in Human Electrocorticography **6465-6468**
Miller, Kai J (University of Washington); Hermes, Dora (University Medical Center Utrecht); Schalk, Gerwin (Wadsworth Center, New York State Department of Health); Ramsey, Nick (University Medical Center Utrecht); Jagadeesh, Bharathi (University of Washington); denNijs, Marcel (University of Washington); Ojemann, Jeffrey G (University of Washington); Rao, Rajesh PN (University of Washington)*

17:25-17:40 SaE10.4
Motion Classification Using Epidural Electrodes for Low-Invasive Brain-Machine Interface **6469-6472**
Uejima, Takeshi (Ministry of Defense); Kita, Kahori (The University of Tokyo); Kato, Ryu (The University of Tokyo); Yokoi, Hiroshi (University of Tokyo)*

17:40-17:55 SaE10.5
Impact of Time-Frequency Representation to the Generalization Ability of Synthesized Time-Frequency Spatial Patterns Algorithm in Brain Computer Interface **6473-6476**
Yao, Jun (Northwestern University); Dewald, Julius P. A. (Northwestern University)*

17:55-18:10 SaE10.6
Optimization of Electrode Channels in Brain Computer Interfaces **6477-6480**
Kamrunnahar, Mst (Kamrun) (The Pennsylvania State University); Dias, Nuno S. (University of Minho); Schiff, Steven (Pennsylvania State University)*

SaE11: 16:40-18:10 Marquette I
6.7.3 Deep Brain Stimulation II (Oral Session)
Chair: Greg Molnar, *Medtronic*
Co-Chair: Aviva Abosch, *Univ. of Minnesota*

16:40-16:55 SaE11.1
One-Dimensional Representation of a Neuron in a Uniform Electric Field **6481-6484**
Radman, Thomas (City College CUNY); Datta, Abhishek (The City College of the CUNY); Bikson, Marom (The City College of New York)*

16:55-17:10 SaE11.2
Finite Difference Time Domain (FDTD) Modeling of Implanted Deep Brain Stimulation Electrodes and Brain Tissue **6485-6488**
Gabran, Salam (University of Waterloo); Saad, John (University of Waterloo); Salama, Magdy (University of Waterloo); Mansour, Raafat (University of Waterloo)*

17:10-17:25 SaE11.3
NeuroRighter: Closed-Loop Multielectrode Stimulation and Recording for Freely Moving Animals and Cell Cultures **6489-6492**
Rolston, John (Emory University School of Medicine); Gross, Robert (Emory University); Potter, Steve (Georgia Institute of Technology)*

SaE12: 16:40-18:10 Marquette VI
7.7.1 Electrical Fields at the Cell and Protein Scale (Oral Session)
Chair: Rafael Davalos, *Virginia Tech*
Co-Chair: Raphael Lee, *University of Chicago*

SaE13: 16:40-18:10 Conrad D
8.9.1 Orthopaedic and Musculoskeletal Biomechanics (Oral Session)
Chair: Yoshihiko Nakamura, *Univ. of Tokyo*
Co-Chair: Mitsuhiro Hayashibe, *INRIA*

16:40-16:55 SaE13.1
EMG-Based Neuromuscular Modeling with Full Physiological Dynamics and Its Comparison with Modified Hill Model **6530-6533**
Hayashibe, Mitsuhiro (INRIA); Guiraud, David (INRIA); POIGNET, Philippe (LIRMM, UMR CNRS 5506,University of Montpellier II)*

16:55-17:10 SaE13.2
Reconstruction and EMG-Informed Control, Simulation and Analysis of Human Movement for Athletics: Performance Improvement and Injury Prevention **6534-6537**
Demircan, Emel (Stanford University); Khatib, Oussama (Stanford University); Wheeler, Jason (Sandia National Laboratories); Delp, Scott (Stanford University)*

17:10-17:25 SaE13.3
Identification and Validation of FES Physiological Musculoskeletal Model in Paraplegic Subjects **6538-6541**
Benoussaad, Mourad (INRIA); Hayashibe, Mitsuhiro (INRIA); Fattal, Charles (PROPARA); POIGNET, Philippe (LIRMM, UMR CNRS 5506,University of Montpellier II); Guiraud, David (INRIA)*

17:25-17:40 SaE13.4
Characterization of Motor Skill Based on Musculoskeletal Model **6542-6545**
Murai, Akihiko (The University of Tokyo); Katsu, Yamane (University of Tokyo); Nakamura, Yoshihiko (University of Tokyo)*

17:40-17:55 SaE13.5
Computationally Fast Estimation of Muscle Tension for Realtime Bio-feedback **6546-6549**
Murai, Akihiko (The University of Tokyo); Kurosaki, Kosuke (The University of Tokyo); Katsu, Yamane (University of Tokyo); Nakamura, Yoshihiko (University of Tokyo)*

SaE14: 16:40-18:10 Marquette III
9.4.3 Diagnostic Devices and Instrumentation (Oral Session)
Chair: Mike McShane, *Texas A&M Univ.*
Co-Chair: Steven Johnson, *EMBS Buenaventura Chapter*

16:40-16:55 SaE14.1
Development of Effective Photoplethysmographic Measurement Techniques: From Contact to Non-Contact and from Point to Imaging **6550-6553**
Hu, Sijung (Loughborough University); Azorin Peris, Vicente (Loughborough University); Echiadis, Angelos (Loughborough University); Zheng, Jia (Loughborough University); Shi, Ping (Loughborough University)*

16:55-17:10 SaE14.2
Quantitative Spectral Reflectance Imaging Device for Intraoperative Breast Tumor Margin Assessment **6554-6556**
Ramanujam, Nimmi (Duke University)*

17:10-17:25 SaE14.3
Spatial Mapping of Real-Time Quantitative Shear Stress with Vascular Oxidative Stress **6557-6559**
Ai, Lisong (University of Southern California); Hsiai, John T. K. (USC)*

17:25-17:40 SaE14.4
Digital Microfluidic Chips for Chemical and Biological Applications **6560-6564**
Fair, Richard (Duke University)*

17:40-17:55 SaE14.5
Development of a Multispectral Tissue Characterization System for Optimization of an Implantable Perfusion Status Monitor for Transplanted Liver **6565-6568**
Baba, Justin S. (Oak Ridge National Laboratory); Letzen, Brian S. (Oak Ridge National Laboratory); Ericson, Nance (Oak Ridge National Laboratory); Coté, Gerard L. (Texas A&M); Xu, Weijian (VA Pittsburgh Healthcare System); Wilson, Mark A. (VA Pittsburgh Healthcare System)*

SaE15: 16:40-18:10 Marquette IX
10.6.1 Wireless Biomedical and Health Technologies (Oral Session)
Chair: Emil Jovanov, *Univ. of Alabama in Huntsville*
Co-Chair: Kwang S. Park, *Seoul National Univ.*

16:40-16:55 SaE15.1
Potential and Challenges of Body Area Networks for Personal Health **6569-6572**
Penders, Julien (Stichting IMEC Nederland); van de Molengraft, Jef (Holst Centre); Brown, Lindsay (Stichting IMEC Nederland); Grundlehner, Bernard (Holst Centre); Gyselinckx, Bert (Stichting IMEC-NL); Van Hoof, Chris (IMEC)*

16:55-17:10 SaE15.2
Nonintrusive Measurement of Biological Signals for Ubiquitous Healthcare **6573-6575**
Park, Kwang S. (Seoul National University)*

17:10-17:25 SaE15.3
Sensium: An Ultra-Low-Power Wireless Body Sensor Network Platform: Design & Application Challenges **6576-6579**
Wong, Alan Chi Wai (Toumaz Technology Ltd.); McDonagh, Declan (Toumaz Technology Ltd.); Omeni, Okundu (Toumaz Technology Ltd.); Nunn, Chris (Toumaz Technology Ltd.); Silveira, Miguel (Toumaz Technology Ltd.); Burdett, Alison (Toumaz Technology Ltd.)*

17:25-17:40 SaE15.4
Clinical Applications of Wearable Technology **6580-6583**
Bonato, Paolo (Harvard Medical School)*

17:40-17:55 SaE15.5
UK and Canadian Perspectives of the Effectiveness of Mobile Diabetes Management Systems **6584-6587**
Istepanian, Robert (Kingston University London); Cafazzo, Joseph (University Health Network); Seto, Emily (University Health Network); Logan, Alexander (Mount Sinai Hospital); Sungoor, Ala (Kingston University London)*

SaE16: 16:40-18:10 Grand Ballroom - Salon A
11.4.2 Minisymposium: People, Places and Companies Involved in the Early History of Biomedical Devices and Instrumentation
Chair: Robert P. Patterson, *Univ. of Minnesota*
Co-Chair: Ron Leder, *Univ. Nacional Autonoma de Mexico*

16:40-17:10 SaE16.1
Medical Alley: The Rise of the Medical Device Industry in Minnesota **6588-6589**
Rhees, David (Bakken Museum)*

17:10-17:40 SaE16.2
Evolution of Microcomputer-Based Medical Instrumentation **6590-6593**
Tompkins, Willis J. (University of Wisconsin - Madison)*

17:40-18:10 SaE16.3
Otto Schmitt's Contributions to Basic and Applied Biomedical Engineering and to the Profession **6594**
Patterson, Robert P. (University of Minnesota)*

SaE17: 16:40-18:10 Directors Row 4
SS 4. Pathways to Success in Biomedical Engineering: Early Career Development (Special Session)
Chair: Kaustubh Patil, *Medtronic, Inc.*

Sunday, 6 September 2009

SuA01: 08:30-10:00 — Conrad B
1.2.6 EEG Signal Processing II (Oral Session)
Chair: Chang-Hwan Im, *Yonsei Univ.*
Co-Chair: Yingchun Zhang, *Univ. of Minnesota*

SuA02: 08:30-10:00 — Conrad C
1.9.1 Data Mining and Biomedical Signal Processing (Oral Session)
Chair: Konstantina Nikita, *National Tech. Univ. of Athens*
Co-Chair: Kazuo Yana, *Hosei Univ.*

SuA03: 08:30-10:00 Grand Ballroom - Salon B
2.6.1 Biomedical Image Reconstruction and Retrieval (Oral Session)
Chair: Jong Chul Ye, *Korea Advanced Inst. of Science & Tech.*
Co-Chair: Mark Anastasio, *Illinois Inst. of Tech.*

SuA05: 08:30-10:00 Marquette V
2.7.8 Tumor Image Analysis (Oral Session)
Chair: Raj Rangayyan, *Univ. of Calgary*
Co-Chair: Shai Ashkenazi, *Univ. of Minnesota*

08:30-08:45 SuA05.1
Detection of Architectural Distortion in Prior Mammograms of Interval-Cancer Cases with Neural Networks **6667-6670**
Banik, Shantanu (Schulich); Rangayyan, Raj (University of Calgary); Desautels, J. E. Leo (University of Calgary)*

08:45-09:00 SuA05.2
Classification of Low Resolution Virtual Slides from Breast Tumor Sections: Comparison between Global and Local Analysis **6671-6674**
Oger, Myriam (François Baclesse Cancer Center - University of Caen); Belhomme, Philippe (University of Caen); Gurcan, Metin (The Ohio State University)*

09:00-09:15 SuA05.3
Identification of Different Types of Lymphoblasts in Acute Lymphoblastic Leukemia Using Relevance Vector Machines **6675-6678**
Gupta, Lalit (Philips Electronics India Ltd.); Jayavanth, Sanjay (Philips Research Asia - Bangalore); Ramaiah, Aruna (Philips Research Asia - Bangalore)*

09:15-09:30 SuA05.4
Computer-Aided Renal Cancer Quantification and Classification Via Histograms of Curvature-Related Features **6679-6682**
Linguraru, Marius George (National Institutes of Health); Wang, Shijun (National Institutes of Health); Shah, Furhawn (National Institutes of Health); Gautam, Rabindra (National Institutes of Health); Peterson, James (National Institutes of Health); Linehan, W. Marston (National Cancer Institutes); Summers, Ronald (National Institutes of Health)*

09:30-09:45 SuA05.5
Automatic Detection of Small Bowel Tumors in Capsule Endoscopy Based in Color Curvelet Covariance Statistical Texture Descriptors **6683-6686**
Barbosa, Daniel (University of Minho); Ramos, Jaime (Hospital dos Capuchos); Correia, Higino (University of Minho); Lima, Carlos Manuel Gregorio Santos (University of Minho)*

09:45-10:00 SuA05.6
Automated Classification of Renal Cell Carcinoma Subtypes Using Scale Invariant Feature Transform . **6687-6690**
Raza, Syed Hussain (Georgia Institute of Technology); Sharma, Yachna (Georgia Institute of Technology); Chaudry, Qaiser (Georgia Institute of Technology); Young, Andrew N (Emory University); Wang, May Dongmei (Georgia Tech and Emory University)*

SuA06: 08:30-10:00 Conrad A
3.7.1 BioMEMS (Oral Session)
Chair: Jun Zou, *Texas A & M Univ.*
Co-Chair: Shuichi Takayama, *Univ. of Michigan*

08:30-09:00 SuA06.1
Hybrid Micro-Technologies for Medical Applications **6691-6692**
Gianchandani, Yogesh (University of Michigan)*

09:00-09:15 SuA06.2
A Nano Grating Tunable MEMS Optical Filter for High-Speed On-Chip Multispectral Fluorescent Detection **6693-6695**
Truxal, Steven (University of Michigan); Huang, Nien-Tsu (University of Michigan); Kurabayashi, Katsuo (University of Michigan)*

SuA07: 08:30-10:00 Marquette VII
2.7.2 Cellular and Molecular Image Processing (Oral Session)
Chair: David Odde, *Univ. of Minnesota*
Co-Chair: Baowei Fei, *Case Western Res. Univ.*

SuA08: 08:30-10:00 Marquette VIII
4.2.1 Bioinformatics Algorithms for Genomics, Proteomics, Metabolomics, and Lipidomics (Oral Session)
Chair: Jiayu Liao, *University of California, Riverside*

SuA09: 08:30-10:00 Marquette II
5.1.2 Cardiovascular Diagnostics & Therapeutics (Oral Session)
Chair: Mark Kroll, *Univ. of Minnesota*
Co-Chair: Hairong zheng, *Shenzhen Inst. of Advanced Tech.*

09:45-10:00 SuA09.6
Non-Invasive Assessment of Cardiac Contractility on a Weighing Scale **6773-6776**
Etemadi, Mozziyar (Stanford University); Inan, Omer (Stanford University); Wiard, Richard M. (Stanford University); Giovangrandi, Laurent (Stanford University); Kovacs, Gregory T.A. (Stanford University)*

SuA10: 08:30-10:00 Grand Ballroom - Salon C
6.11.1 Functional Electrical Stimulation (FES) (Oral Session)
Chair: Dominique Durand, *Case Western Res. Univ.*

08:30-08:45 SuA10.1
Computational Modeling of Peripheral Nerve Stimulation **6777-6780**
Tracey, Brian (NEUROMetrix, Inc); Krastev, Plamen (Neurometrix, Inc); Han, Zhixiu (Neurometrix Inc); Williams, Michael (Neurometrix, Inc)*

08:45-09:00 SuA10.2
Intraurethral Activation of Excitatory Bladder Reflexes in Persons with Spinal Cord Injury **6781-6784**
Yoo, Paul (Duke University); Horvath, Eric (Duke University); Amundsen, Cindy (Duke University Medical Center); Webster, George (Duke University Medical Center); Grill, Warren (Duke University)*

09:00-09:15 SuA10.3
Muscle Fatigue of Quadriceps in Paraplegics: Comparison between Single vs. Multi-Pad Electrode Surface Stimulation **6785-6788**
Malešević', Nebojša (Faculty of Electrical Engineering, University of Belgrade); Popovic, Lana (Faculty of Electrical Engineering, University of Belgrade)*

09:15-09:30 SuA10.4
Motion Control of the Rabbit Ankle Joint Using a Flat Interface Nerve Electrode **6789-6792**
Park, Hyunjoo (Case Western Reserve University); Durand, Dominique (Case Western Reserve University)*

09:30-09:45 SuA10.5
Development of an Implanted Intramuscular EMG-Triggered FES System for Ambulation after Incomplete Spinal Cord Injury **6793-6797**
Dutta, Anirban (Howard Hughes Medical Institute); Kobetic, Rudi (Louis Stokes Veterans Affairs Medical Center); Triolo, Ronald J. (US Department of Veterans Affairs & Case Western Reserve University)*

09:45-10:00 SuA10.6
Single Channel Hybrid FES Gait System Using an Energy Storing Orthosis: Preliminary Design **6798-6801**
Durfee, William (University of Minnesota)*

SuA11: 08:30-10:00 Marquette I
6.6.1 Neural Signal Processing I (Oral Session)
Chair: Shanbao Tong, *Shanghai Jiao Tong University*
Co-Chair: Anastasios Bezerianos, *PATRAS*

08:30-09:00 SuA11.1
Predicting Perceptual Suppression from Local Field Potential in Visual Cortex **6802-6805**
Zhang, Hongmiao (Drexel University); Logothetis, Nikos K. (MPI for Biological Cybernetics); Liang, Hualou (Drexel University)*

09:00-09:15 SuA11.2
Stochastic Resonance Can Enhance Information Transmission of Supra-Threshold Neural Signals **6806-6809**
Kawaguchi, Minato (Waseda University); Mino, Hiroyuki (Kanto Gakuin University); Momose, Keiko (Waseda University); Durand, Dominique (Case Western Reserve University)*

09:15-09:30 SuA11.3
Correlation between Visual Stimulus Eccentricity and Multiscale Neuronal Activity in the Lateral Geniculate Nucleus **6810-6813**
Farkas, Agnes (University of Szeged); Tsarouchas, Nikolaos (UNIVERSITY OF PATRAS); Gombkoto, Peter (University of Szeged); Nagy, Attila (University of Szeged); Benedek, Gyorgi (University of Szeged); BEZERIANOS, Anastasios (UNIVERSITY OF PATRAS); Berenyi, Antal (University of Szeged)*

09:30-09:45 SuA11.4
Statistical Analysis and Modeling of Variance in the SA-I Mechanoreceptor Response to Sustained Indentation **6814-6817**
Lesniak, Daine (University of Virginia); Wellnitz, Scott (Baylor College of Medicine); Gerling, Gregory (University of Virginia); Lumpkin, Ellen (Baylor College of Medicine)*

09:45-10:00 SuA11.5
Influence of Subcortical Ischemic Stroke on Cortical Neural Network **6818-6821**
Zhu, Chengyu (Shanghai Jiao Tong University); Guo, Xiaoli (Shanghai Jiao Tong University); Wu, Wenqing (Shanghai Jiao Tong University); Jin, Zheng (the 5th People's Hospital of Shanghai); Qiu, Yihong (Shanghai Jiao Tong University); Zhu, Yisheng (Shanghai Jiaotong University); Tong, Shanbao (Shanghai Jiao Tong University)*

SuA12: 08:30-10:00 Marquette VI
7.9.1 Hybrid Organic Synthetic Biomaterials for Sensing and Actuation (Oral Session)
Chair: John David Wyndham Madden, *University of British Columbia*
Co-Chair: John Bischof, *Univ. of Minnesota*

08:30-09:00 SuA12.1
Artificial Muscle Actuators in Biorobotic Fish Fins **6822-6825**
Phelan, Chris (Drexel University); MacDonald, Robert (Shearwater scientific); Tangorra, James (Drexel University)*

09:00-09:15 SuA12.2
Artificial Muscles Based on Synthetic Dielectric Elastomers **6826-6829**
Pei, Qibing (UCLA)*

09:15-09:30 SuA12.3
Wearable Kinesthetic Systems and Emerging Technologies in Actuation for Upperlimb Neurorehabilitation **6830-6833**
De Rossi, Danilo (University of Pisa); Carpi, Federico (University of Pisa); Iorussi, federico (University of Pisa); Scilingo, Enzo Pasquale (University of Pisa); tognetti, alessandro (University of Pisa)*

09:30-09:45 SuA12.4
Thermo-Mechanical Characterization of Polypyrrole Compliance Using Stochastic System Identification. **6834-6837**
Pillai, Priam (Massachusetts Institute of Technology); Hunter, Ian (Massachusetts Institute of Technology)*

09:45-10:00 SuA12.5
Potential/Charge Induced Nanoporous Metal Actuators **6838-6841**
RAGHAVAN NADAR, VISWANATH (Forschungszentrum Karlsruhe,)*

SuA13: 08:30-10:00 Conrad D
8.1.2 Minisymposium: Frontiers of Microrobotics in Endo-and Transluminal Therapy
Chair: Paolo Dario, *Scuola Superiore Sant'Anna*
Co-Chair: Jacob Rosen, *Univ. of California - Santa Cruz*

08:30-08:45 SuA13.1
Miniaturized Robotic Devices for Endoluminal Diagnosis and Surgery: A Single-Module and a Multiple-Module Approach **6842-6845**
Menciassi, Arianna (Scuola Superiore Sant'Anna); Dario, Paolo (Scuola Superiore Sant'Anna)*

08:45-09:00 SuA13.2
Modular "Plug-And-Play" Capsules for Multi-Capsule Environment in the Gastrointestinal Tract **6846-6849**
Phee, Louis (Nanyang Technological University); Ting, Eng Kiat (Nanyang Technological University); Lin, Lin (Nanyang Technological University); HUYNH, VAN AN (NANYANG TECHNOLOGICAL UNIVERSITY); Kencana, Andy Prima (Nanyang Technological University); Wong, Kai-Juan (Nanyang Technological University); Tan, Su-Lim (Nanyang Technological University)*

09:00-09:15 SuA13.3
Some Control-Related Issues in Mini-Robotics for Endoluminal Surgery **6850-6855**
POIGNET, Philippe (LIRMM, UMR CNRS 5506,University of Montpellier II); chemori, ahmed (LIRMM); Zemiti, Nabil (Université Montpellier 2, CNRS/UM2); Liu, Chao (LIRMM Laboratory)*

09:15-09:30 SuA13.4
Characterization of SMA Actuator for Applications in Robotic Neurosurgery **6856-6859**
Desai, Jaydev (University of Maryland)*

09:30-09:45 SuA13.5
Teleoperation in Surgical Robotics – Network Latency Effects on Surgical Performance **6860-6863**
Rosen, Jacob (University of California - Santa Cruz); Lum, Mitchell (Intel Corp.); Lendvay, Thomas (University of Washington); Sinanan, Mika (University of Washington); Hannaford, Blake (University of Washington); Friedman, Diana (University of Washington); Wright, Andrew (University of Washington)*

SuA14: 08:30-10:00 Marquette III
9.4.4 Quantitative Metabolic Physiology (Oral Session)
Chair: Jon Moon, *Devicix, LLC*
Co-Chair: Kong Chen, *National Inst. of Health*

08:30-08:45 SuA14.1
Optimizing Energy Expenditure Detection in Human Metabolic Chambers **6864-6868**
Brychta, Robert (National Institutes of Diabetes and Digestive andKidneyDiseases, NIH); Rothney, Megan (GE); Skarulis, Monica (National Institutes of Health); Chen, Kong (National Institutes of Health)*

08:45-09:00 SuA14.2
Quantification of Food Intake Using Food Image Analysis **6869-6872**
Martin, Corby (Pennington Biomedical Research Center); KAYA, SERTAN (Louisiana State University); Gunturk, Bahadir (Louisiana State University)*

09:00-09:15 SuA14.3
A Novel Approach for Measuring Energy Expenditure in Free-Living Humans **6873-6877**
Melanson, Edward (University of Colorado Denver); Szuminsky, Neil (LifeChek LLC); Dykstra, John (MetaLogics Corporation)*

09:15-09:30 SuA14.4
Assessing the Metabolic Cost of Walking: The Influence of Baseline Subtractions **6878-6881**
Weyand, Peter (Southern Methodist University); Sandell, Rosalind (Southern Methodist University)*

09:30-09:45 SuA14.5
Integration of Multiple Physiological Signals to Evaluate the Human Body's Response to an Environmental Challenge. **6882-6884**
McKenzie, Jack (Philips Respironics)*

SuA15: 08:30-10:00 Marquette IX
10.2.1 Wireless and Ubiquitous Medical Devices (Oral Session)
Chair: Robert Istepanian, *Kingston Univ. London*
Co-Chair: Julien Penders, *Stichting IMEC Nederland*

08:30-08:45 SuA15.1
Understanding Energy Consumption of Sensor Enabled Applications on Mobile Phones **6885-6888**
Crk, Igor (University of Arizona); Albinali, Fahd (MIT); Hartman, John (University of Arizona); Gniady, Chris (University of Arizona)*

08:45-09:00 SuA15.2
Predicting Cardiovascular Disease from Real-Time Electrocardiographic Monitoring: An Adaptive Machine Learning Approach on a Cell Phone **6889-6892**
Jin, Zhanpeng (University of Pittsburgh); Sun, Yuwen (University of Pittsburgh); Cheng, Allen C. (University of Pittsburgh)*

09:00-09:15 SuA15.3
Time Encoding and Reconstruction of Multichannel Data by Brain Implants Using Asynchronous Sigma Delta Modulators **6893-6896**
Senay, Seda (University of Pittsburgh); Chaparro, Luis F. (University of Pittsburgh); Sclabassi, Robert (University of Pittsburgh); Sun, Mingui (University of Pittsburgh)*

SuA16: 08:30-10:00 Grand Ballroom - Salon A
6.11.2 Prosthetic Control (Oral Session)
Chair: Guanglin Li, *Chinese Acad. of Sciences*
Co-Chair: Kathleen H. Sienko, *Univ. of Michigan*

SuB01: 10:20-11:50 Conrad B
1.6.1 Biomedical Adaptive Filtering I (Oral Session)
Chair: Issa Panahi, *Univ. of Texas at Dallas*
Co-Chair: Massimo Mischi, *Eindhoven Univ. of Tech.*

SuB02: 10:20-11:50 Conrad C
1.9.2 Computational Genomics and Proteomics (Oral Session)
Chair: Konstantina Nikita, *National Tech. Univ. of Athens*

SuB03: 10:20-11:50 Grand Ballroom - Salon B
2.8.1 Image Visualization and Volume Rendering (Oral Session)
Chair: Anthony Reeves, *Cornell Univ.*
Co-Chair: Ashish Raj, *Weill Medical Coll. of Cornell Univ.*

10:20-10:35 SuB03.1
New Blockwise Permutation Tests Preserving Exchangeability in Functional Neuroimaging 6977-6980
Zhou, Chunxiao (University of Illinois at Urbana-Champaign); Wang, Yongmei Michelle (University of Illinois at Urbana-Champaign)*

10:35-10:50 SuB03.2
An Integrated Multimodality MR Brain Imaging Study: Gray Matter Tissue Loss Mediates the Association between Cerebral Hypoperfusion and Alzheimer's Disease 6981-6984
Tosun, Duygu (Center for Imaging Neurodegenerative Diseases)*

10:50-11:05 SuB03.3
Visualization and Segmentation of Liver Tumors Using Dynamic Contrast MRI 6985-6989
Raj, Ashish (Weill Medical College of Cornell University)*

11:05-11:20 SuB03.4
Local and Global Panoramic Imaging for Fluorescence Bladder Endoscopy 6990-6993
Behrens, Alexander (RWTH Aachen University); Stehle, Thomas (RWTH Aachen University); Gross, Sebastian (RWTH Aachen University); Aach, Til (RWTH Aachen University)*

11:20-11:35 SuB03.5
Automated 3-D Tracking of Centrosomes in Sequences of Confocal Image Stacks 6994-6997
Kerekes, Ryan (Oak Ridge National Laboratory); Gleason, Shaun S. (Oak Ridge National Laboratory); Trivedi, Niraj (St. Jude Children's Research Hospital); Solecki, David (St. Jude Children's Research Hospital)*

SuB05: 10:20-11:50 Marquette V
1.2.5 Biomedical Modelling and Simulation I (Oral Session)
Chair: Junichi Hori, *Niigata Univ.*
Co-Chair: Jie Zhang, *Medical School, Univ. of Minnesota*

10:20-10:35 SuB05.1
Spike Library Based Simulator for Extracellular Single Unit Neuronal Signals 6998-7001
Thorbergsson, Palmi Thor (Lund University); Jorntell, Henrik (Experimental Medical Science); Bengtsson, Fredrik (Experimental Medical Science); Garwicz, Martin (Lund University); Schouenborg, Jens (Lund University); Johansson, Anders (Lund University)*

10:35-10:50 SuB05.2
A Statistical Model for Multiphoton Calcium Imaging of the Brain 7002-7005
Malik, Wasim Q. (Massachusetts Institute of Technology); Schummers, James (Massachusetts Institute of Technology); Sur, Mriganka (MIT); Brown, Emery N (MGH-Harvard Medical School-MIT)*

10:50-11:05 SuB05.3
Medial-Lateral Postural Control in Older Adults Exhibits Increased Stiffness and Damping 7006-7009
Cenciarini, Massimo (University of Pittsburgh); Loughlin, Patrick (University of Pittsburgh); Sparto, Patrick (University of Pittsburgh); Redfern, Mark (University of Pittsburgh)*

11:05-11:20 SuB05.4
Using a Bi-Planar Postural Stability Model to Assess Children with Scoliosis 7010-7013
Riedel, Susan (Marquette University); Bustamante Valles, Karla (Marquette University); Harris, Gerald (Marquette University); Long, Jason (Medical College of Wisconsin); Graf, Adam (Shriners Hospital for Children); Krzak, Joe (Shriners Hospital of Chicago); Sturm, Peter (Shriners Hospitals for Children); Hassani, Sahar (Shriners Hospital of Chicago)*

11:20-11:35 SuB05.5
Dynamic Gesture Recognition Based on Multiple Sensors Fusion Technology 7014-7017
Wang, Wenhui (University of Science and Technology of China); Chen, Xiang (University of Science & Technology of China); Wang, Kong-qiao (Nokia); Zhang, Xu (University of Science & Technology of China); Yang, Jihai (University of Science and Technology of China)*

11:35-11:50 SuB05.6

Exploration on the Feasibility of Building Muscle-Computer Interfaces Using Neck and Shoulder Motions **7018-7021**

Zhang, Xu (University of Science & Technology of China); Chen, Xiang (University of Science & Technology of China); Lantz, Vuokko (Nokia); Yang, Jihai (University of Science and Technology of China); Wang, Kong-qiao (Nokia)*

SuB06: 10:20-11:50 Conrad A

3.9.2 Microfluidics Methods, Systems and Microtechnology (Oral Session)

Chair: Ali Khademhosseini, *Harvard-MIT*

Co-Chair: Shuichi Takayama, *Univ. of Michigan*

10:20-10:35 SuB06.1

Polyimide-Based Multi-Channel Arrayed Electrode for Measuring EEG Signal on the Skull of Mouse **7022-7025**

Baek, Dong-Hyun (Korea University); Lee, Eun-Joong (College of Health Science, Korea University.); Moon, Jin-hee (Seoul National University); Choi, Jee Hyun (Korea Institute of ScienceandTechnology,UniversityofScience and Technology); Pak, James Jungho (Korea University); Lee, Sang hun (College of Medicine Korea University)*

10:35-10:50 SuB06.2

Hollow Polymer Microneedle Array Fabricated by Photolithography Process Combined with Micromolding Technique **7026-7029**

Wang, Po-Chun (Georgia Tech); Allen, Mark (Georgia Institute of Technology)*

10:50-11:05 SuB06.3

A Passive Microfluidic Device for Plasma Extraction from Whole Human Blood **7030-7033**

Sollier, Elodie (CEA Leti Minatec); Cubizolles, Myriam (CEA Leti Minatec); Faivre, Magalie (CEA Leti Minatec); Fouillet, Yves (CEA Leti Minatec); Achard, Jean-Luc (Laboratoire des Ecoulements Géophysiques et industriels)*

11:05-11:20 SuB06.4

Improving Alternate Flow Mixing by Obstacles Located Along a Micro-Channel **7034-7036**

Miranda, Joao Mario (University of Minho); Teixeira, Jose (University of Minho); Vicente, Antonio (University of Minho); Correia, Higino (University of Minho); Minas, Graca (University of Minho)*

11:20-11:35 SuB06.5

Microfluidic Encapsulation of Cells in Alginate Capsules for High Throughput Screening **7037-7040**

Trivedi, Varun (Wayne State University); Ereifej, Evon (Wayne State University); Doshi, Ankur (Wayne State University); Sehgal, Priyanka (Wayne State University); VandeVord, Pamela (Wayne State University); Basu, Amar (Wayne State University)*

SuB07: 10:20-11:50 Marquette VII

11.1.1 Technology Development, Assessment and Management (Oral Session)

Chair: Mark Kroll, *Univ. of Minnesota*

10:20-10:35 SuB07.1

Is BIS Monitoring Cost-Effective? **7041-7044**

Abenstein, John Peter (Mayo Clinic College of Medicine)*

10:35-10:50 SuB07.2

A Protocol Design for Evaluation of Wearable Cuff-Less Blood Pressure Measuring Devices **7045-7047**

Yan, Renfei (The Chinese University of Hong Kong); Poon, Carmen CY (The Chinese University of Hong Kong); Zhang, Yuan-Ting (The Chinese University of Hong Kong)*

10:50-11:05 SuB07.3

Medical Devices for Developing Countries: Design Constraints and Approaches **7048-7051**

Nimunkar, Amit (University of Wisconsin-Madison); Baran, Jonathan (University of Wisconsin-Madison); Webster, John (University of Wisconsin Madison)*

11:05-11:20 SuB07.4

Cells to Society: Lactate and Neuromuscular Incapacitation Devices **7052-7056**

Marino, Bruno (Axonix Technologies); Stethem, Kenneth (Aegis Industries)*

11:20-11:35 SuB07.5
Proving Experience Speeds Medical Device Time to Market **7057-7060**
Lucke, Lori (Minnetronix Inc); Mickelson, Anne (Minnetronix, Inc.); Anderson, Dave (Minnetronix)*

11:35-11:50 SuB07.6
Security of the Food Supply Chain **7061-7064**
Setola, Roberto (Univ. CAMPUS Bio-Medico); De Maggio, Maria Carla (University Campus Bio-Medico of Rome)*

SuB08: 10:20-11:50 Marquette VIII
4.6.1 Biological and Medical Data Management, Ontology, Mining, and Visualization (Oral Session)
Chair: Gregory A. Worrell, *Mayo Clinic*

10:20-10:35 SuB08.1
Computing Human Image Annotation **7065-7068**
Channin, David Samuel (Northwestern University); Mongkolwat, Pattanasak (Northwestern University); Kleper, Vladimir (Northwestern University); Rubin, Daniel (Stanford University)*

10:35-10:50 SuB08.2
Entity/Quality-Based Logical Definitions for the Human Skeletal Phenome Using PATO **7069-7072**
Robinson, Peter (Charité - Universitätsmedizin Berlin)*

10:50-11:05 SuB08.3
Exploitation of Ontological Resources for Scientific Literature Analysis: Searching Genes and Related Diseases **7073-7078**
Jimeno-Yepes, Antonio Jose (European Bioinformatics Institute); Berlanga-Llavori, Rafael (Universitat Jaume I, Spain); Rebholz-Schuhmann, Dietrich (European Bioinformatics Institute)*

11:05-11:20 SuB08.4
Search of Phenotype-Related Candidate Genes Using Gene Ontology-Based Semantic Similarity and Protein Interaction Information: Application to Brugada Syndrome **7079-7082**
Massanet Vila, Raimon (Universitat Politècnica de Catalunya); Gallardo-Chacón, Joan-Josep (CIBER Bioengineering, Biomaterials, and Nanomedicin); Caminal, Pere (Technical University of Catalonia (UPC)); Perera, Alexandre (Universitat Poltècnica de Catalunya)*

11:20-11:35 SuB08.5
Multiscale Electrophysiology Format: An Open-Source Electrophysiology Format Using Data Compression, Encryption, and Cyclic Redundancy Check **7083-7086**
Brinkmann, Benjamin (Mayo Foundation); Bower, Mark (Mayo Clinic); Worrell, Gregory A. (Mayo Clinic); Stead, Matt (Mayo Clinic)*

11:35-11:50 SuB08.6
Transcription Factor Binding Site Detection through Position Cross-Mutual Information Variability Analysis **7087-7090**
Joan, Maynou Fernàndez (Universitat Politècnica de Catalunya); Vallverdu, Montserrat (Technical University of Catalonia); Claria, Francesc (Lleida University); Gallardo-Chacón, Joan-Josep (CIBER Bioengineering, Biomaterials, and Nanomedicin); Caminal, Pere (Technical University of Catalonia (UPC)); Perera, Alexandre (Universitat Poltècnica de Catalunya)*

SuB09: 10:20-11:50 Marquette II
5.10.1 Sleep Apnea (Oral Session)
Chair: Thomas Penzel, *Charite Univ. Hospital*
Co-Chair: W. G. Besio, *Univ. of Rhode Island*

10:20-10:35 SuB09.1
SleepMinder: An Innovative Contact-Free Device for the Estimation of the Apnoea-Hypopnoea Index. **7091-7094**
Zaffaroni, Alberto Antonio (Biancamed Ltd); de Chazal, Philip (BiancaMed Ltd); Heneghan, Conor (BiancaMed); Mc Nicholas, Walter (St. Vincent's University Hospital); Boyle, Patricia (St Vincents Private Hospital); Ronayne, Patricia (St Vincent's Healthcare Group)*

10:35-10:50 SuB09.2
Development of an Apnea Detector for Neonates Using Diaphragmatic Surface Electromyography **7095-7098**
Osorio, Juan Sebastián (Antioquia School of Engineering, CES Univ.); Torres, Róbinson (Antioquia School of Engineering, CES University); Ochoa, Jose Mauricio (Antioquia School of Engineering, CES Univ.); McLeod, Christopher N (Imperial College London)*

10:50-11:05 SuB09.3
Revised Recommendations for Computer-Based Sleep Recording and Analysis **7099-7101**
Penzel, Thomas (Charite University Hospital)*

11:05-11:20 SuB09.4
Automatic differentiation of obstructive and central hypopneas with esophageal pressure measurement during sleep **7102-7105**
Morgenstern, Christian (Institut de Bioenginyería de Catalunya); Schwaibold, Matthias (MCC-Med GmbH & Co KG); Randerath, Winfried (Klinikum Bethanien); Bolz, Armin (University of Karlsruhe); Jané, Raimon (Universitat Politècnica de Catalunya)*

11:20-11:35 SuB09.5
Sleep Disordered Breathing Detection Using Heart Rate Variability and R-Peak Envelope Spectrogram **7106-7109**
Al-Abed, Mohammad (University of Texas at Arlington); Manry, Michael (The University of Texas at Arlington); Burk, John R. (Sleep Consultants Inc.); Lucas, Edgar A (Sleep Consultants Inc.); Behbehani, Khosrow (University of Texas at Arlington)*

11:35-11:50 SuB09.6
Acoustic Obstructive Sleep Apnea Detection **7110-7113**
Yadollahi, Azadeh (University of Manitoba); Moussavi, Zahra (University of Manitoba)*

SuB10: 10:20-11:50 Grand Ballroom - Salon C
6.10.1 Robotics in Rehabilitation I (Oral Session)
Chair: James Patton, *Rehab Inst. of Chicago & U. of Illinois at Chicago*
Co-Chair: Jaydev Desai, *Univ. of Maryland*

10:20-10:35 SuB10.1
Robust Multivariable Strategy and Its Application to a Powered Wheelchair **7114-7117**
Nguyen, Tuan Nghia (University of Technology, Sydney); Nguyen, Hung T. (University of Technology, Sydney); Su, Steven Weidong (University of Technology, Sydney)*

10:35-10:50 SuB10.2
Adaptive Shared Control Strategies Based in the Bayesian Recursive Technique in an Intelligent Wheelchair **7118-7121**
Trieu, Tuyen Hoang (University of Technology, Sydney); Nguyen, Hung T. (University of Technology, Sydney); Willey, Keith (University of Technology, Sydney)*

10:50-11:05 SuB10.3
Development of Hand Rehabilitation System for Paralysis Patients - Universal Design Using Wire-Driven Mechanism - **7122-7125**
Yamaura, Hiroshi (The University of Tokyo); Matsushita, Kojiro (The University of Tokyo); Kato, Ryu (The University of Tokyo); Yokoi, Hiroshi (University of Tokyo)*

11:05-11:20 SuB10.4
Patient-Specific Walking Pattern Simulation in a Gait Trajectory Guiding Device **7126-7130**
Hasan, Muhammad Kamrul (Kyung Hee University, South Korea); Park, Jang Ho (Kyunghee University); Park, Seung-Hun (Kyung Hee Univercity); HWANG, SUN HEE (Kyung Hee University); Khang, Gon (Kyung Hee University)*

11:20-11:35 SuB10.5
Treadmill Motor Current Value Based Walk Phase Estimation **7131-7134**
Ohki, Eiichi (Waseda University); Nakashima, YASUTAKA (Waseda University); Ando, Takeshi (Waseda University); Fujie, Masakatsu G. (Waseda University)*

11:35-11:50 SuB10.6
Design and Development of an Upper Extremity Motion Capture System for a Rehabilitation Robot 7135-7138
Nanda, Pooja (Rochester Institute of Technology); Smith, Alan (Rochester Institute of Technology); Gebregiorgis, Adey (Rochester Institute of Technology); Brown, Edward (Rochester Institute of Technology)*

SuB11: 10:20-11:50 Marquette I
6.14.1 Tissue/Electrode Interface (Oral Session)
Chair: Hubert Lim, *Univ. of Minnesota*
Co-Chair: Jack Judy, *UCLA*

10:20-10:35 SuB11.1
Effects of adsorbed proteins, an antifouling agent and long-duration DC voltage pulses on the impedance of silicon-based neural microelectrodes 7139-7142
Sommakia, Salah (Purdue University); Rickus, Jenna (Purdue University); Otto, Kevin (Purdue University)*

10:35-10:50 SuB11.2
In Vitro and in Vivo Electrochemical Characterization of a Microfabricated Neural Probe 7143-7146
Musa, Silke (IMEC); Welkenhuysen, Marleen (IMEC); Prodanov, Dimiter (IMEC); Eberle, Wolfgang (IMEC); Bartic, Carmen (IMEC); Nuttin, Bart (KU Leuven); Borghs, Gustaaf (IMEC)*

10:50-11:05 SuB11.3
Penetrating Microelectrode Arrays with Low-Impedance Sputtered Iridium Oxide Electrode Coatings 7147-7150
Cogan, Stuart (EIC Laboratories, Inc.); Ehrlich, Julia (EIC Laboratories); Plante, Timothy D. (EIC Laboratories); Van Wagenen, Rick (Blackrock Microsystems)*

11:05-11:20 SuB11.4
Adhesion Molecules Promote Chronic Neural Interfaces Following Neurotrophin Withdrawal 7151-7154
Winter, Jessica (the Ohio State University); Han, Ning (the Ohio State University); Jensen, Ralph (Boston VA Healthcare System); Cogan, Stuart (EIC Laboratories, Inc.); Rizzo, Joseph F. (Boston VA Healthcare System)*

11:20-11:35 SuB11.5
An in Vitro System for Modeling Brain Reactive Responses and Changes in Neuroprosthetic Device Impedance 7155-7158
Frampton, John (SUNY at Albany); Hynd, Matthew (New York State Department of Health); Vargun, Aytekin (Rensselaer Polytechnic Institute); Roysam, Badrinath (Rensselaer Polytechnic Institute); Shain, William (New York State Department of Health)*

SuB12: 10:20-11:50 Marquette VI
8.8.2 Biomechanical Modeling and Simulation I (Oral Session)
Chair: Victor Barocas, *Univ. of Minnesota*
Co-Chair: Yo Kobayashi, *Waseda Univ.*

10:20-10:35 SuB12.1
Longitudinal Strain Estimation in Incompressible Cylindrical Tissues from Magnetic Resonance Imaging 7159-7163
Wei, Qi (Rutgers University); Pai, Dinesh K. (UBC)*

10:35-10:50 SuB12.2
Upper Extremity Biomechanical Model of Crutch-Assisted Gait in Children 7164-7167
Bhagchandani, Neha (Marquette University); Slavens, Brooke (Marquette University); Wang, Mei (Medical College of Wisconsin); Harris, Gerald (Marquette University)*

10:50-11:05 SuB12.3
A Morphological Approach to the Simulation of Forearm Motion 7168-7171
Fuernstahl, Philipp (ETH Zuerich); Schweizer, Andreas (Balgrist University Hospital); Nagy, Ladislav (Balgrist University Hospital); Szekely, Gabor (ETH Zurich); Harders, Matthias (Swiss Federal Institute of Technology (ETH))*

11:05-11:20 SuB12.4
The Effect of Modern Total Knee Arthroplasty on Muscle Balance at the Knee 7172-7175
Buford, William L (The Univ of Texas Medical Branch); Ivey, F. Marty (University of Texas Medical Branch); Loveland, Dustin M. (Univ. of Texas Medical Branch); Flowers, Christopher W. (University of Texas Medical Branch)*

11:20-11:35 SuB12.5
Development of a Kinematic 3D Carpal Model to Analyze in Vivo Soft-Tissue Interaction across Multiple Static Postures **7176-7179**
Marai, Georgeta Elisabeta (University of Pittsburgh); Crisco, Joseph (Brown University); Laidlaw, David (Brown University)*

11:35-11:50 SuB12.6
Dynamic AFM Elastography Reveals Phase Dependent Mechanical Heterogeneity of Beating Cardiac Myocytes **7180-7183**
Costa, Kevin D. (Mount Sinai School of Medicine); Azeloglu, Evren U. (Mount Sinai School of Medicine)*

SuB13: 10:20-11:50 Conrad D
8.2.1 BioMimetic Robotics I (Oral Session)
Chair: Cecilia Laschi, *Scuola Superiore Sant'Anna*

10:20-10:35 SuB13.1
Investigations of Mammalian Echolocation **7184-7187**
Edwards, David Steven (University of Southampton); Allen, Robert (University of Southampton); Papadopoulos, Timos (University of Southampton); Rowan, Daniel (University of Southampton); Kim, Su Yeon (University of Southampton); Wilmot-Brown, LaToya (University of Southampton)*

10:35-10:50 SuB13.2
Behavioral Match Evaluation of Spatial Cognition in Rats and Robots **7188-7191**
Barrera, Alejandra (Mexico's Autonomous Institute of Technology); Weitzenfeld, Alfredo (ITAM)*

10:50-11:05 SuB13.3
Design and Development of Biomimetic Quadruped Robot for Behavior Studies of Rats and Mice **7192-7195**
Ishii, Hiroyuki (Waseda University); Yuichi, Masuda (Waseda University); Miyagishima, Syunsuke (Faculty of Science and Engineering); Fumino, Shogo (Faculty of Science and Engineering); Takanishi, Atsuo (Waseda University); Laschi, Cecilia (Scuola Superiore Sant'Anna); Mazzolai, Barbara (Scuola Superiore Sant'Anna); Mattoli, Virgilio (Scuola Superiore Sant'Anna); Dario, Paolo (Scuola Superiore Sant'Anna)*

11:05-11:20 SuB13.4
Tools and Methods for Experimental In-Vivo Measurement and Biomechanical Characterization of an Octopus vulgaris Arm **7196-7199**
Margheri, Laura (Scuola Superiore Sant'Anna); Mazzolai, Barbara (Scuola Superiore Sant'Anna); Cianchetti, Matteo (Scuola Superiore Sant'Anna); Dario, Paolo (Scuola Superiore Sant'Anna); Laschi, Cecilia (Scuola Superiore Sant'Anna)*

11:20-11:35 SuB13.5
A Multi-Level Robotic Architecture for Biologically-Inspired Modeling **7200-7203**
Weitzenfeld, Alfredo (ITAM); Barrera, Alejandra (Mexico's Autonomous Institute of Technology)*

11:35-11:50 SuB13.6
Functional Contrast and Kinetic Analysis of Water-Dispersible Carbon Black Nanoparticles and MWNTs in Glucose Biosensors **7204-7207**
yang, hao (Zhejiang University); Yang, Xiaohe (Zhejiang University); Pan, Min (Zhejiang University); Chen, Yuquan (Zhejiang University)*

SuB14: 10:20-11:50 Marquette III
9.6.1 Safety and Medical Device Design (Oral Session)
Chair: Dustin Tyler, *Case Western Res. Univ.*
Co-Chair: Babak Ziaie, *Purdue Univ.*

10:20-10:35 SuB14.1
Safety Design for Medical Robots **7208-7211**
Kazanzides, Peter (Johns Hopkins University)*

10:35-10:50 SuB14.2
Twenty Year Experience with Implanted Neuroprostheses **7212-7215**
Kilgore, Kevin (MetroHealth Medical Center); Peckham, Hunter (Case Western Reserve University); Keith, Michael (MetroHealth Medical Center)*

SuB15: 10:20-11:50 Marquette IX
10.4.1 Technologies for Chronic Disease Management and Assisted Living (Oral Session)
Chair: Michael Pavel, *Oregon Health and Science Univ.*
Co-Chair: Constantinos Pattichis, *Univ. of Cyprus*

SuB16: 10:20-11:50 Grand Ballroom - Salon A
6.11.3 Rehabilitation I (Oral Session)
Chair: William Durfee, *Univ. of Minnesota*
Co-Chair: Mehdi Mirbagheri, *Northwestern Univ.*