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Information Technology in Biomedicine

June 15-16, 2020

Conference program

Conference organizers:



Silesian University
of Technology

Faculty of Biomedical Engineering
Department of Informatics and
Medical Devices

Monday, June 15th, 2020

09:00	Opening	
Moderator: <i>prof. Ewa Piętka</i>		
09:15	Invited lecture: <i>prof. Metin Akay</i> Advanced Technologies for BRAIN Initiatives	
Medical Data Analysis and Artificial Intelligence Chair: <i>prof. Michał Strzelecki, dr. Joanna Czajkowska</i>		
10:15	3-D Tissue Image Reconstruction from Digitized Serial Histologic Sections to Visualize Small Tumor Nests in Lung Adenocarcinomas <i>Bartomiej Pyciński, Yukako Yagi, Ann E. Walts, Arkadiusz Gertych</i>	
10:30	MRFU-Net: A Multiple Receptive Field U-Net for Environmental Microorganism Image Segmentation <i>Chen Li, Jinghua Zhang, Xin Zhao, Frank Kulwa, Zihan Li, Hao Xu, Hong Li</i>	
10:45	The Influence of Age on Morphometric and Textural Vertebrae Features in Lateral Cervical Spine Radiographs <i>Patrycja Mazur, Rafał Obuchowicz, Adam Piórkowski</i>	
11:00	Videoplethysmographic Measurements of Pulse Wave Velocity and Pulse Transit Time <i>Anna Pajqk, Piotr Augustyniak</i>	
11:15	Biomechanical Methods of Validating Animations <i>Filip Wróbel, Dominik Szajerman, Adam Wojciechowski</i>	
11:30	One 'Stop Smoking' to Take Away, Please! A Preliminary Evaluation of an AAT Mobile App <i>Tanja Joan Eiler, Tobias Forneberg, Armin Grünwald, Alla Machulska, Tim Klucken, Katharina Jahn, Björn Niehaves, Carl Friedrich Gethmann, Rainer Brück</i>	
11:45	The Classifier Algorithm for Recognition of Basic Driving Scenarios <i>Rafał Doniec, Szymon Sieciński, Natalia Piaseczna, Katarzyna Mocny-Pachońska, Marta Lang, Jacek Szymczyk</i>	
12:00	Break	
12:30	e-Poster Session Chair: <i>prof. Ziemowit Ostrowski, dr. Jan Juszczyk</i>	
	Deep Learning Approach to Subepidermal Low Echogenic Band Segmentation in High Frequency Ultrasound <i>Joanna Czajkowska, Wojciech Dziurawicz, Paweł Badura, Szymon Korzekwa</i>	A Review of Clustering Methods in Microorganism Image Analysis <i>Chen Li, Frank Kulwa, Jinghua Zhang, Zihan Li, Hao Xu, Xin Zhao</i>
	Deep Learning Approach to Automated Segmentation of Tongue in Camera Images for Computer-Aided Speech Diagnosis <i>Agata Sage, Zuzanna Miadońska, Michał Kręćchwost, Joanna Trzaskalik, Ewa Kwaśniok, Paweł Badura</i>	Evaluation of Shape from Shading Surface Reconstruction Quality for Liver Phantom <i>Mateusz Bas, Dominik Spinczyk</i>
	Pancreas and Duodenum – Automated Organ Segmentation <i>Piotr Zarychta</i>	Evaluation of the Effect of a PCL/nanoSiO ₂ Implant on Bone Tissue Regeneration Using X-Ray Micro-Computed Tomography <i>Magdalena Jędzierowska, Marcin Binkowski, Robert Koprowski, Zygmunt Wróbel</i>
	Flow in a Myocardial Bridge Region of a Coronary Artery – Experimental Rig and Numerical Model <i>Bartłomiej Melka, Marcin Nowak, Marek Rojczyk, Maria Gracka, Wojciech Adamczyk, Ziemowit Ostrowski, Ryszard Bialecki</i>	Numerical Model of the Aortic Valve Implanted Within Real Human Aorta <i>Marcin Nowak, Wojciech Adamczyk, Bartłomiej Melka, Ziemowit Ostrowski, Ryszard Bialecki</i>
	Establishment of an in-Silico Model for Simulation of Dehydration Process in Human Skin to Compare Output Parameter with Clinical Study <i>Jana Viehbeck, Alexandra Speich, Svetlana Ustinov, Dominik Böck, Michael Wiehl, Rainer Brück</i>	SAR Evaluation in Human Head Models with Cochlear Implant near PIFA Antenna Inside a Railway Vehicle <i>Mariana Benova, Jana Mydlova, Zuzana Psenakova, and Maros Smondrk</i>
	Monitoring Temperature-Related Hazards Using Mobile Devices and a Thermal Camera <i>Mariusz Marzec</i>	
13:30	Lunch break	
Moderator: <i>prof. Ewa Piętka</i>		
14:30	Invited lecture: <i>prof. Stephen Wong</i> Convergent AI in Precision Medicine – Reduce Wastes, Do No Harm, and Avoid Misdiagnosis	
15:30	Concert	

Tuesday, June 16th, 2020

Moderator: prof. Paweł Badura

09:00 Invited lecture: **Krzysztof Osior**
Future of Medical Image Processing Technology

09:45 Invited lecture: **Michał Smoliński**
Artificial Intelligence in Medical Diagnosis - Current State Challenges and Perspectives

10:30 Invited lecture: **prof. Jens Hauelsen**
Resonance and Entrainment in the Brain

11:15 **Break**

Special Session: Sound & Motion in Physiotherapy & Physioprevention

Chair: prof. Andrzej W. Mitas

11:45 Sound Generation by Body Actions in Music Motor Feedback – Physiotherapy
Bruce Turner

12:00 Methods Supporting the Understanding of Structural Information by Blind People and Selected Aspects of their Evaluation
Michał Maćkowski, Katarzyna Rojewska, Mariusz Dzieciąg, Katarzyna Bielecka, Mateusz Bas, Dominik Spinczyk

12:15 Application of Original System to Support Specialist Physiotherapy D4S in Correction of Postural Defects as Compared to other Methods – A Review
Karol Bibrowicz, Tomasz Szurmik, Anna Lipowicz, Andrzej W. Mitas

12:30 Psycho-Physiological State Changes Assessment Based on Thermal Face Image – Preliminary Results
Marta Danch-Wierzchowska, Marcin Bugdol, Andrzej W. Mitas

12:45 Methods for Assessing the Subject's Multidimensional Psychophysiological State in Terms of Proper Rehabilitation
Anna Mańka, Patrycja Romaniszyn, Monika N. Bugdol, Andrzej W. Mitas

13:00 Behavioral and Physiological Profile Analysis while Exercising – Case Study
Patrycja Romaniszyn, Damian Kania, Monika N. Bugdol, Anita Pollak, Andrzej W. Mitas

13:15 Methods of Therapy of Scoliosis and Technical Functionalities of DISC4SPINE (D4S) Diagnostic and Therapeutic System
Tomasz Szurmik, Karol Bibrowicz, Anna Lipowicz, Andrzej W. Mitas

13:30 **Break**

Special Session: Sound & Motion in Physiotherapy & Physioprevention

Chair: prof. Andrzej W. Mitas

13:45 Effect of Various Types of Metro-Rhythmic Stimulations on the Variability of Gait Frequency
Robert Michnik, Katarzyna Nowakowska-Lipiec, Anna Mańka, Sandra Niedzwiedz, Patrycja Twardawa, Patrycja Romaniszyn, Bruce Turner, Aneta Danecka, Andrzej W. Mitas

14:00 Computer-Based Analysis of Spontaneous Infant Activity: a Pilot Study
Iwona Doroniewicz, Daniel Ledwoń, Monika N. Bugdol, Katarzyna Kieszczyńska, Alicja Affanasowicz, Małgorzata Matyja, Dariusz Badura, Andrzej W. Mitas, Andrzej Myśliwiec

14:15 Cross-Modal Music-Emotion Retrieval Using DeepCCA
Naoki Takashima, Frédéric Li, Marcin Grzegorzek, Kimiaki Shirahama

14:30 Multimodal Signal Acquisition for Pain Assessment in Physiotherapy
Aleksandra Badura, Maria Bieñkowska, Aleksandra Masłowska, Robert Czarlewski, Andrzej Myśliwiec, Ewa Pietka

14:45 Classification of Heat-induced Pain Using Physiological Signals
Philip J. Gouverneur, Frédéric Li, Tibor M. Szikszay, Waclaw M. Adamczyk, Kerstin Luedtke, Marcin Grzegorzek

15:00 **Break**

Discussion Panel: Biomedical Engineering in Physiotherapy

Chair: prof. Andrzej Mitas

Panelists:
dr Roman Kostur - Consultant of the Silesian Voivodeship in the field of Physiotherapy,
prof. Małgorzata Matyja, prof. Andrzej Myśliwiec, prof. Andrzej Małecki,
prof. Tomasz Szurmik, dr. Karol Bibrowicz

16:15 **Closing**