



June 20-22, 2022

9th

International Conference
Information Technology in Biomedicine

Conference program

CONFERENCE ORGANIZER



Silesian University
of Technology



Faculty of Biomedical Engineering
Department of Medical Informatics
and Artificial Intelligence



Monday, June 20th, 2022

08:00	Registration
09:00	Opening
Moderators: prof. Ewa Piętka, prof. Ryszard Białecki	
09:15	Invited lecture: prof. Leif Rune Hellevik <i>Reflections on clinically relevant cardiovascular models and sensitivity analysis</i>
Special session: Sound & Motion Chair: prof. Andrzej W. Mitas	
10:00	The Effect of Therapeutic Commands on the Teaching of Maintaining Correct Static Posture <i>Damian Kania, Tomasz Szurmik, Karol Bibrowicz, Patrycja Romaniszyn-Kania, Mirosław Czak, Anna Mańka, Maria Rosiak, Bruce Turner, Anita Pollak, Andrzej W. Mitas</i>
10:15	Improving the Process of Verifying Employee Potential During Preventive Work Examinations – a Case Study <i>Marcin Bugdol, Anita Pollak, Patrycja Romaniszyn-Kania, Monika N. Bugdol, Magdalena Jesionek, Aleksandra Badura, Paulina Krasnodębska, Agata Szkiełkowska, Andrzej W. Mitas</i>
10:30	The Microphone Type and Voice Acoustic Parameters Values – A Comparative Study <i>Łukasz Pawelec, Anna Lipowicz, Mirosław Czak, Andrzej W. Mitas</i>
10:45	Coffee break
Moderator: prof. Andrzej W. Mitas	
11:15	Invited lecture: prof. Hartmut Witte <i>Active and assisted living - a modular assistive exoskeleton for the upper extremity</i>
Image analysis Chair: prof. Michał Strzelecki, dr. Joanna Czajkowska	
11:45	Comparison of Analytical and Iterative Algorithms for Reconstruction of Microtomographic Phantom Images and Rat Mandibular Scans <i>Paweł Lipowicz, Agnieszka Dardzińska-Głębocka, Marta Borowska, Ander Biguri</i>
12:00	Comparison of Interpolation Methods for MRI Images Acquired with Different Matrix Sizes <i>Adam Cieślak, Adam Piórkowski, Rafał Obuchowicz</i>
12:15	Preprocessing of Laryngeal Images from High-Speed Videoendoscopy <i>Justyna Kałuża, Paweł Strumiłło, Ewa Niebudek-Bogusz, Wioletta Pietruszewska</i>
12:30	Construction of a Cephalometric Image Based on Magnetic Resonance Imaging Data <i>Piotr Cenda, Rafał Obuchowicz, Adam Piórkowski</i>
13:00	Lunch
14:00	Analysis of Changes in Corneal Structure During Intraocular Pressure Measurement by Air-Puff Method <i>Magdalena Jędzierowska, Robert Koprowski, Sławomir Wilczyński</i>
14:15	Discrimination Between Stroke and Brain Tumour in CT Images Based on the Texture Analysis <i>Monika Kobus, Karolina Sobczak, Mariusz Jangas, Adrian Świątek, Michał Strzelecki</i>
14:30	The Influence of Textural Features on the Differentiation of Coronary Vessel Wall Lesions Visualized on IVUS Images <i>Weronika Małek, Tomasz Roleder, Elżbieta Pociask</i>
14:45	Study on the Impact of Neural Network Architecture and Region of Interest Selection on the Result of Skin Layer Segmentation in High-Frequency Ultrasound Images <i>Dżesika Szymańska, Joanna Czajkowska, Szymon Korzekwa, Anna Płatkowska-Szczerek</i>
15:00	Skin Lesion Matching Algorithm for Application in Full Body Imaging Systems <i>Maria Strąkowska, Marcin Kociołek</i>
15:15	Semantic Segmentation of Abnormal Lung Areas on Chest X-rays to Detect COVID-19 <i>Artur Przelaskowski, Magdalena Jasionowska-Skop, Grzegorz Ostrek</i>
15:30	Rigid and Elastic Registrations Benchmark on Re-stained Histologic Human Ileum Images <i>Paweł Cyprys, Natalia Wyleżół, Adrianna Jagodzińska, Julia Uzdowska, Bartłomiej Pyciński, Arkadiusz Gertych</i>
Moderator: prof. Andrzej W. Mitas	
15:45	Invited lecture: Bruce Turner <i>Music & Biocybernetics</i>
16:00	Coffee break
16:30	e-Poster Session Chair: dr. Jacek Kawa, dr. Jan Juszczyk
18:00	Concert
19:00	Gala dinner

Tuesday, June 21st, 2022

Moderator: prof. Marcin Grzegorzek

09:00 Invited lecture: **prof. Francesco Ciompi**
Computational pathology in precision oncology

09:45 Invited lecture: **prof. Kerstin Lütke**
Acute and chronic pain perception - alterations of sensory, motor and autonomic nervous system function

10:30 **Coffee break**

Special Session: Computational Methods for Understanding Human Complexity

Chair: prof. Marcin Grzegorzek

11:00 Classifying Changes in Motion Behaviour Due to a Hospital Stay Using Floor Sensor Data – a Single Case Study
Laura Liebenow, Jasmin Walter, Raoul Hoffmann, Axel Steinhage, Marcin Grzegorzek

11:15 Cloud-Based System for Vital Data Recording at Patients' Home
Alexander Keil, Kai Hahn, Rainer Brück, Nick Brombach, Nabeel Farhan, Olaf Gaus

11:30 Tele-BRAIN Diagnostics Support System for Cognitive Disorders in Parkinson's Patients
Andrzej W. Mitas, Agnieszka A. Gorzkowska, Katarzyna Zawiślak-Fornagiel, Andrzej S. Małecki, Monika N. Bugdol, Marcin Bugdol, Marta Danch-Wierzchowska, Julia M. Mitas, Robert Czarlewski

11:45 EEG Signal and Deep Learning Approach in Evaluation of Cognitive Declines in Parkinson's Disease
Marcin Bugdol, Daniel Ledwoń, Monika N. Bugdol, Katarzyna Zawiślak-Fornagiel, Marta Danch-Wierzchowska, Andrzej W. Mitas

12:00 The Role of Two-Dimensional Entropies in IRT-Based Pregnancy Determination Evaluated on the Equine Model
Marta Borowska, Małgorzata Maško, Tomasz Jasiński, Małgorzata Domino

12:15 Eye-Tracking as a Component of Multimodal Emotion Recognition Systems
Weronika Celniak, Piotr Augustyniak

12:30 Sleep Quality in Population Studies – Relationship of BMI and Sleep Quality in Men
Agnieszka Witek, Marcin Bugdol, Anna Lipowicz

12:45 Morphological Language Features of Anorexia Patients Based on Natural Language Processing
Stella Maćkowska, Klaudia Barańska, Agnieszka Różańska, Katarzyna Rojewska, Dominik Spinczyk

13:15 **Lunch**

Special Session: Biomedical Engineering and Physiotherapy, Joint Activities, Common Goals

Chair: prof. Andrzej Myśliwiec

14:30 Analysis of Expert Agreement on Determining the Duration of Writhing Movements in Infants to Develop an Algorithm in OSESEC
Dominika Latos, Daniel Ledwoń, Marta Danch-Wierzchowska, Iwona Doroniewicz, Alicja Affanasowicz, Katarzyna Kieszczyńska, Małgorzata Matyja, Andrzej Myśliwiec

14:45 Head Pose and Biomedical Signals Analysis in Pain Level Recognition
Maria Bierkowska, Aleksandra Badura, Andrzej Myśliwiec, Ewa Pietka

15:00 Electromyograph as a Tool for Patient Feedback in the Field of Rehabilitation and Targeted Muscle Training
Michał Prochazka, Vladimir Kasik

15:15 Touchless Pulse Diagnostics Methods and Devices: a Review
Anna Pajqk, Piotr Augustyniak

15:30 Methods of Functional Assessment of the Temporomandibular Joints – Systematic Review
Damian Kania, Patrycja Romaniszyn-Kania, Marcin Bugdol, Anna Lipowicz, Krzysztof Dowgierd, Małgorzata Kulesa-Mrowiecka, Zofia Polewczyk, Łukasz Krakowczyk, Andrzej Myśliwiec

17:00 **Social event**

19:00 **Dinner**

Wednesday, June 22nd, 2022

Moderator: prof. Paweł Badura

09:00	Invited lecture: prof. Les Sztandera <i>Telehealth and Digital Health Innovation at Thomas Jefferson University</i>
09:45	Invited lecture: prof. Andrzej Małeck <i>Drugs in Sport</i>
10:30	Coffee break
Special Session: Signal Processing Chair: prof. Dominik Spinczyk	
11:00	Activities Classification Based on IMU Signals <i>Monika N. Bugdol, Marta Danch-Wierzchowska, Marcin Bugdol, Dariusz Badura</i>
11:15	Heart Rate Measurement Based on Embedded Accelerometer in a Smartphone <i>Mirella Urzeniczok, Szymon Sieciński, Paweł Kostka</i>
11:30	Non-Invasive Measurement of Human Pulse Based on Photographic Images of the Face <i>Jakub Gumulski, Marta Jankowska, Dominik Spinczyk</i>
11:45	The Validation Concept for Automatic Electroencephalogram Preprocessing <i>Julia M. Mitas, Katarzyna Zawiślak-Fornagiel</i>
Special Session: Simulation and Modeling Chair: prof. Krzysztof Fajarewicz	
12:00	Finding the Time-Dependent Virus Transmission Intensity via Gradient Method and Adjoint Sensitivity Analysis <i>Krzysztof Łakomic, Agata Wilk, Krzysztof Psiuk-Maksymowicz, Krzysztof Fajarewicz</i>
12:15	A Revealed Imperfection in Concept Drift Correction in Metabolomics Modeling <i>Jana Schwarzerova, Ales Kostoval, Adam Bajger, Lucia Jakubikova, Iro Pierides, Lubos Popelinsky, Karel Sedlar, Wolfram Weckwerth</i>
12:30	Two-Dimensional vs. Scalar Control of Blood Glucose Level in Diabetic Patients <i>Jarosław Śmieja, Artur Wyciślok</i>
12:45	Gene Expression Analysis of the Bladder Cancer Patients Managed by Radical Cystectomy <i>Anna Tamulewicz, Alicja Mazur</i>
13:15	Lunch & Closing

e-Poster Session

Exploring Developmental Factors Related to Auditory Processing Disorder in Children <i>Michał Kręcichwost, Natalia Moćko, Magdalena Ławecka, Zuzanna Miodońska, Agata Sage, Paweł Badura</i>	Computer Aided Analysis of Clock Drawing Test Samples via PACS Plugin <i>Jacek Kawa, Maria Bienkowska, Adam Bednorz, Michał Smoliński, Emilia J. Sitek</i>
Artifact Detection on X-ray of Lung with COVID-19 Symptoms <i>Alicja Moskal, Magdalena Jasionowska-Skop, Grzegorz Ostrek, Artur Przelaskowski</i>	Verification of Selected Segmentation Methods in Relation to the Structures of the Knee Joint <i>Weronika Żak, Piotr Zarychta</i>
DVT: Application of Deep Visual Transformer in Cervical Cell Image Classification <i>Wanli Liu, Chen Li, Hongzan Sun, Weiming Hu, Haoyuan Chen, Marcin Grzegorzek</i>	Image Classification in Breast Histopathology Using Transfer and Ensemble Learning <i>Yuchao Zheng, Chen Li, Xiaomin Zhou, Haoyuan Chen, Haiqing Zhang, Yixin Li, Hongzan Sun, Marcin Grzegorzek</i>
PIS-Net: A Novel Pixel Interval Sampling Network for Dense Microorganism Counting in Microscopic Images <i>Jiawei Zhang, Chen Li, Hongzan Sun, Marcin Grzegorzek</i>	Comparative Analysis of Selected Methods of Identifying the Newborn's Skeletal Model <i>Adam Mrozek, Marta Danch-Wierzchowska, Daniel Ledwoń, Dariusz Badura, Iwona Doroniewicz, Monika N. Bugdol, Małgorzata Matyja, Andrzej Myśliwiec</i>
Do Contractions of Abdominal Muscles Bias Parameters Describing Contractile Activities of a Uterus? A Preliminary Study <i>Dariusz Radomski</i>	The Influence of Low-Intensity Pulsed Ultrasound (LIPUS) on the Properties of PLGA Biodegradable Polymer Coatings on Ti6Al7Nb Substrate <i>Karolina Goldsztajn, Janusz Szewczenko, Joanna Jaworska, Katarzyna Jelonek, Katarzyna Nowińska, Wojciech Kajzer, Marcin Basiaga</i>