icBEM 2015

The 10th International Conference on Bioelectromagnetism

Devoted to Robert Plonsey

16-18 June 2015
Tallinn, Estonia

www.icbem2015.eu

Welcome to the 10th icBEM conference here in Tallinn, Estonia.

The International Society for Bioelectromagnetism and
Tallinn University of Technology are organizing this anniversary event in collaboration with the International Society for Electrical Bioimpedance and the ELIKO Competence Centre.

On behalf of the local organizing team at the Tallinn University of Technology and ELIKO Competence Centre we hope you enjoy your stay in Tallinn and the quality scientific program at icBEM 2015.

We are certain that these next couple of days will be filled with interesting presentations, engaging discussions and friendly reunions.

The present conference is devoted to the memory of
Professor Robert Plonsey, who has done so much to the success of electromagnetism as a branch of science and technology.
He passed away in March this year.

I wish you a fruitful conference and trust that
you will gain from the experience.

Professor Mart Min
President of the icBEM2015

DAY 1 – Tuesday, June 16th 2015

09:20 –	Bus transfer from the Viru Hotel
09:50 – 10:10	**Registration**
10:10 – 10:25	**Conference opening, Prof Mart Min**
10:30 – 12:00	**Plenary speeches:**
10:30 – 11:25	**Robert Patterson**, University of Minnesota, USA – Otto Schmitt: the Schmitt trigger and his many other major contributions to bioelectromagnetism.
11:25 – 12:00	**Jaakko Malmivuo**, Aalto University, Finland – Were the first ones really the first ones?
12:00 – 12:40	LUNCH
12:40 – 14:40	**Session 1: Transcranial Neural Stimulation** **Chair Prof. Risto Ilmoniemi, Aalto University, Helsinki, Finland**
12:40 – 13:00	**Risto Ilmoniemi**, Aalto University, Finland - Introduction to TMS - transcranial magnetic stimulation.
13:00 – 13:20	**Jyrki Mäkelä**, Helsinki University Central Hospital, Finland - Navigated transcranial magnetic stimulation in clinical practice and research.
13:20 – 13:40	**Vadim Nikulin**, Charité-University Medicine, Germany - Spatio-temporal neuronal dynamics in subthalamic nucleus and cortex in patients with Parkinson's disease.
13:40 – 14:00	**Petro Julkunen**, Kuopio University Hospital, Finland - Non-invasive estimation of motor cortical functional anisotropy and muscle representation with neuro-navigated transcranial magnetic stimulation.
14:00 – 14:20	**Renate Rutiku**, University of Tartu, Estonia - An uncommon masking effect on visual perception with TMS.
14:20 – 14:40	**Rauno Gordon**, ELIKO Competence Centre, Estonia - Frequency-optimized short rectangular chirp pulses for deep brain stimulation.
14:40 – 14:50	COFFEE BREAK
14:50 – 16:00	**Session 2: Magnetic Induction based sensing** **Chair: Dr. Daniel Teichmann,** **RWTH University Aachen, Germany**

14:50 - 15:20	**Session Keynote Speech - Daniel Teichmann**, RWTH Aachen University, Germany - Monitoring of thoracic activity using electromagnetic coupling.
15:20 - 15:40	**Jaan Ojarand**, ELIKO Competence Centre, Tallinn, Estonia - Magnetic Induction Sensor for the Respiration Monitoring.
15:40 - 16:00	**Jüri Vedru**, University of Tartu, Estonia - Experience from a Trial Study of Getting Foucault Cardiograph Signal from Salty Water Medium.
16:00 – 16:15	COFFEE BREAK
16:15 – 17:45	**Session 3: Homage to Professor Robert Plonsey** **Chair Prof. Mart Min, Thomas Johann Seebeck Department of Electronics at Tallinn University of Technology, Tallinn, Estonia**
16:15-16:45	**Jaakko Malmivuo**, Aalto University, Helsinki, Finland - Robert Plonsey 1924 – 2015, scientist, teacher, gentleman and friend.
16:45-17:15	**Yoram Rudy**, Cardiac Bioelectricity and Arrhythmia Center at Washington University in St. Louis, Missouri, USA - Robert Plonsey: A mentor and inspirator.
17:15-17.30	**Craig Henriquez and Marjorie Hubbard**, Duke University, Durham, NC, USA - The Evolution of Cardiac Tissue Models.
17.30-17:45	**Olaf von Ramm,** Duke University, Durham, NC, USA
17:45 – 18:00	COFFEE BREAK
20:00-22:00	WELCOME DINNER

DAY 2 – Wednesday, June 17th

08:30 – 09:00	Bus transfer from the Hotel Viru to the IT-College, Raja 4C, Tallinn
09:00 – 10:30	**Session 1: Bioimpedance I** **Chair: Prof. Uwe Pliquett, Institut für Bioprozess- und Analysenmesstechnik (iba), Heilbad Heiligenstadt, Germany**
09:00 – 09:30	**Session Keynote Speech: Uwe Pliquett**, iba, Germany - Adaptive signal sampling for high throughput, broadband impedance spectroscopy.

09:30 – 09:50	**Juho Kari**, Injeq Ltd, Finland - Biopsy Needle Including Bioimpedance Probe with Optimized Sensitivity Distribution.
09:50 – 10:10	**Andrei Krivoshei**, Tallinn University of Technology, Estonia - Estimating the Transfer Function Between the CAP and Radial EBI Cardiac Periods: Use of PCA for Dominating Spectral Features Extraction.
10:10 – 10:30	**Atte Kekonen**, Tampere University of Technology, ioMediTech, Finland - A Quantitative Method for Monitoring Wound Healing.
10:30 – 10:45	COFFEE BREAK (15 min)
10:45 – 12.05	**Session 2: Bioelectricity** **Chair: Prof. R Martin Arthur, Washington University in St. Louis, Missouri, USA**
10:45 – 11:05	**Hamed Hamid Muhammed**, KTH Royal Institute of Technology, Sweden – Optomyography (OMG):A Novel Technique for the Detection of Muscle Surface Displacement Using Photoelectric Sensors.
11:05 – 11:25	**Ruth Tomson**, Tallinn University of Technology, Estonia - Development of an optical monitoring technology for urea rebound assessment.
11:25 – 11:45	**Ksenija Pesti**, Tallinn University of Technology, Estonia - Validation of Simulations of Eddy Current Methods with Measurements on Phantom Materials for Biomedical Engineering R&D.
11:45 – 12:05	**R Martin Arthur**, Washington University in St. Louis, USA - Errors in Inverse Problem Solutions Due To Inaccuracies in Torso and Cardiac Anatomy.
12:05 – 13:00	LUNCH and ISBEM General Meeting
13:00 – 14:30	**Session 3: Bioimpedance II** **Chair: Prof. Robert Patterson, University of Minnesota, Minneapolis, USA**
13:00 – 13:30	**Session Keynote Speech. Robert Patterson**, University of Minnesota, USA - The Early History of Impedance Cardiography and Reflections on its Current State.
13:30 – 13:50	**Raul Land**, Tallinn University of Technology, Estonia - Some observations on impedance and Ferranti effect.

13:50 – 14:10	**Carles Aliau-Bonet**, Universitat Politècnica de Catalunya, Barcelona - Effects of interelectrode impedance in water conductivity measurements with capacitive electrodes.
14:10 – 14:30	**Javier Gracia**, Tampere University of Technology, Finland - Multilead, impedance pneumography and forced oscillation technique for assessing lung tissue mechanical properties.
14:30 – 14:45	COFFEE BREAK
14:45 – 16:25	**Session 4: Electromagnetic phenomena and wearable/implantable devices** **Chair: Dr. Paul Annus, Tallinn University of Technology and ELIKO Competence Centre, Tallinn, Estonia.**
14:45 – 15:05	**Margus Metshein**, Tallinn University of Technology, Estonia - Observations Concerning the Results of Capacitive Monitoring of Breathing and Heart Rate by the Means of Electrical Bioimpedance.
15:05 – 15:25	**Margus Metshein**, Tallinn University of Technology, Estonia - Towards a Wearable Device for Capacitive Monitoring of Electrical Bioimpedance of Human Body.
15:25 – 15:45	**Faisal Ahmed**, Tallinn University of Technology, Estonia - Energy Harvesting Technologies - Potential application to Wearable Health-Monitoring.
15:45 – 16:05	**Andres Kink**, Smartimplant OÜ, Tallinn University of Technology, Estonia - Pacing algorithm test environment for simulating critical bleeding situations.
16:05 – 16:25	**Eiko Priidel**, Tallinn University of Technology, Estonia - Bridging the Gap between Technology and Usability for Portable Brain Trauma Scanning Device.
16:25 – 16:30	**Closing Remarks**
16:25 – 16:40	COFFEE BREAK
16:40 – 17:10	Bus transfer to the hotel
18:15 – 20:15	Walking tour in the Old Town with English speaking guide

Competence Centre in Electronics-,
Info- and Communication Technologies

ELIKO Competence Centre is focused on applied research and development in electronics. Our researchers and engineers design novel Internet of Things (IoT) embedded sensing and communication systems.

ELIKO was established more than 10 years ago and currently employs around 60 part- and full time employees. The company is working closely with the Tallinn University of Technology researchers and actively develops and promotes engineering education in electronics and ICT.

ELIKO owns several patents relevant to pacing control,
body impedance spectroscopy and human activity monitoring.

Our key technologies include:
- City control system infrastructure for smart services
- Impedance based medical instrumentation
- UWB based indoor positioning

We are always looking for new cooperation partners as well as researchers interested in working with us. Please contact us for more details or approach one of our people at the conference.

Indrek Ruiso
CEO

The conference is supported by honourable Advisory Committee

Advisory Committe

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