

PROGRAM



JANUARY 14, 2019
12:30-14:00 – Arrival to TalTech Virumaa College (Järveküla str. 75, Kohtla-Järve), Guided Tour, Lunch and Registration
14:00-15:00 - OPENING CEREMONY Chairman: Prof. Dmitri Vinnikov, Co-Chairman: Dr. Elizaveta Liivik
Welcome Address from Dean's Office of School of Engineering of TalTech <i>Argo Rosin, Vice-Dean for Research of School of Engineering, TalTech</i>
Welcome Address from TalTech Virumaa College <i>Mare Roosileht, Director for Development of TalTech Virumaa College</i>
Welcome Address from Department of Electrical Power Engineering and Mechatronics <i>Ivo Palu, Head of the Department of Electrical Power Engineering and Mechatronics, TalTech</i>
Symposium Information from General Chairman <i>Dmitri Vinnikov, General Chairman of the Symposium</i>
15:00-17:00 – INVITED SPEECHES Chairman: Prof. Ivo Palu, Co-Chairman: Prof. Tauno Otto
Highly Efficient and Fault Tolerant SiC-based Smart Transformer in Distributed Energy Systems <i>Mariusz Malinowski, Warsaw University of Technology, Poland</i>
About Building's Flexibility and Grid Interaction <i>Joao Martins, FCT/UNL – UNINOVA, Portugal</i>
ISEAUTO - First Estonian Self-Driving Vehicle <i>Anton Rassõlkin, TalTech, Estonia</i>
Energy Harvesting for IoT <i>Enrique Romero-Cadaval, University of Extremadura, Spain</i>
Important Projects for Common European Interest <i>Tauno Otto, TalTech, Estonia</i>
Commercialization of Research Results in Latvia <i>Janis Zakis, Riga Technical University, Latvia /Investment and Development Agency of Latvia</i>
17:00-18:00 – Transfer to Toila Spa Hotel (Ranna 12, Toila)
20:00-23:00 – Welcome Reception

JANUARY 15, 2019

9:00-10:00 – Invited Speeches

MECHANICAL ENGINEERING AND MECHATRONICS

Chairman: Prof. Tauno Otto, Co-Chairman: Prof. Trieu Minh Vu

Trajectory Generation and Control of a Nonholonomic System

Didier Pascault, *UPJV – Amiens, France*

Haptic Glove for Augmented and Virtual Reality

Trieu Minh Vu, *TalTech, Estonia*

Research of the Properties of Wear-Resistant Coatings Used in the Mining Industry

Galina Tsvetkova, *Peter the Great St. Petersburg Polytechnic University, Russian Federation*

Composite Winding Designing and Control of the Process of its Making

Aleksei Kutin, *ITMO University, Russian Federation*

10:00-11:30 – Regular Session

MECHANICAL ENGINEERING AND MECHATRONICS - I

Chairman: Prof. Didier Pascault, Co-Chairman: Dr. Galina Tsvetkova

Development of Performance Evaluation model for a Robot-Based Manufacturing Cell

Tavo Kangru, *TalTech, Estonia*

Stability Calculation of a Wind Plant Tower

Andriushchenko Ekaterina, *Peter the Great St. Petersburg Polytechnic University, Russian Federation*

Simulation of the Human Musculoskeletal System in Two Phases of Movement

Maria Kurenkova, *ITMO University, Russian Federation*

Crowd Evacuation Using Agent-based Model in VR Simulation

Ruxin Wang, *TalTech, Estonia / University of Science and Technology Beijing, China*

Digital Twin Based Synchronized Control and Simulation of the Industrial Robotic Cell using Virtual Reality

Vladimir Kuts, *TalTech, Estonia*

Mechatronic Complex Tribal-T for Monitoring of Friction Surfaces in Real-Time Mode

Kirill Nuzhdin, *ITMO University, Russian Federation*

11:30-13:00 – Regular Session

MECHANICAL ENGINEERING AND MECHATRONICS - II

Chairman: Prof. Eduard Ševtšenko, Co-Chairman: Dr. Aleksei Kutin

Designing a Manipulator Control System Using Gait Angular Parameters

Mikhail Erofeev, *ITMO University, Russian Federation*

Modeling of UAV Flight

Andrei Shumski, *Belarusian State Technological University, Belarus*

<p>A Method of Enumerative Classification of Human Musculoskeletal System Zhongkai Zhang, <i>ITMO University, Russian Federation</i></p>
<p>Vision Based Sensor Analysis for Mobile Robots Ehsan Malayjerdi, <i>TalTech, Estonia</i></p>
<p>Comparison of the Porous Structure of Oil Shale Fly Ashes from Two Different CFB Boilers Heliis Pikkor, <i>TalTech, Estonia</i></p>
<p>Dissemination of Engineering Education at Schools and its Adjustment to Needs of Enterprises Eduard Ševtšenko, <i>TalTech, Estonia</i></p>
<p>13:00-14:00 – Lunch</p>
<p>14:00-16:00 – PhD THESIS DEFENCE - I</p>
<p>Roman Kosenko, <i>Department of Electrical Power Engineering and Mechatronics, TalTech, Estonia</i> Bidirectional Isolated Current-Fed Soft-Switching Secondary-Modulated DC-DC Converters Supervisors: Prof. Dmitri Vinnikov, Dr. Andrei Blinov, <i>TalTech, Estonia</i> Dr. Oleksandr Husev, <i>Chernihiv National University of Technology, Ukraine</i> Opponents: Prof. Andrés Barrado Bautista, <i>Universidad Carlos III de Madrid, Spain</i> Prof. Staffan Norrga, <i>KTH Royal Institute of Technology, Sweden</i></p>
<p>16:00-16.30 – Coffee</p>
<p>16.30-18:30 – PhD THESIS DEFENCE - II</p>
<p>Kashif Mahmood, <i>Department of Mechanical and Industrial Engineering, TalTech, Estonia</i> Reliability Management Approach for a Virtual Enterprise of SMEs in a Manufacturing Domain Supervisors: Prof. Eduard Ševtšenko, Prof. Tauno Otto, <i>TalTech, Estonia</i> Opponents: Prof. Marcello Urgo, <i>Polytechnic University of Milan, Italy</i> Dr. Tõnu Leemet, <i>Estonian University of Life Sciences, Estonia</i></p>
<p>19:00-20:00 – Dinner</p>
<p>20:00-23:00 – Social Events: - Handmade Beer Workshop - Clay Workshop - Midnight Quiz</p>

JANUARY 16, 2019

09:00-11:00 – Invited Speeches

POWER ELECTRONICS AND ELECTRICAL ENGINEERING - I

Chairman: Prof. Enrique Romero-Cadaval, Co-Chairman: Dr. Oleksandr Husev

Current-Limiting Control for Power Electronic Converters

George Konstantopoulos, *University of Sheffield, United Kingdom*

PV Module Integrated DC-DC Converters with Wide Input Voltage Regulation Range - Implementation Challenges and Application Benefits

Andrii Chub, *TalTech, Estonia*

An Innovative LVDC Hybrid Circuit Breaker

Luigi Piegari, *Politecnico di Milano, Italy*

An Indirect Model Predictive Current Control (CCS-MPC) for Grid-Connected Single-Phase Three-Level NPC Quasi-Z-Source PV Inverter

Sergio Pires Pimentel, *Federal University of Goias, Brazil*

Bidirectional Four-Switch Buck-Boost Converter. Modulation and Control Design

Andres Barrado, *Universidad Carlos III de Madrid, Spain*

Bidirectional DC-DC Converter with Extended ZVS/ZCS Range for Storage Applications

Andrei Blinov, *TalTech, Estonia*

A FPGA-Based Rapid Prototyping Approach for Power Electronics

Sergii Ivanets, *Chernihiv National University of Technology, Ukraine*

Improved Methods of Active Thermal Control for Modular Power Converters

Jose Leon, *University of Seville, Spain*

11:00-13:00 – Invited Speeches

POWER ELECTRONICS AND ELECTRICAL ENGINEERING - II

Chairman: Prof. Jose Leon, Co-Chairman: Dr. Andrei Blinov

Converters for Resistance Welding Applications: Overview

Oleksandr Bondarenko, *Igor Sikorsky Kyiv Polytechnic Institute, Ukraine*

Novel Family of Buck-Boost Inverters with Unfolding Circuits Suitable for String Photovoltaic Application

Oleksandr Husev, *TalTech, Estonia*

Superconducting Devices in Electric Power Applications

Anabela Pronto, *FCT NOVA/CTS - Centre of Technology and Systems, Portugal*

Inverter Circuit Frequency Response Analysis

Marius Klytta, *TH Mittelhessen - University of Applied Sciences, Germany*

Can Electrical Phenomena be Explained with the Concept of an „Electric Family Tree”?

Jaani Järvi, *TalTech, Estonia*

Rapid Prototyping - Speed up Your Power Electronic Design

Indrek Roasto, *TalTech, Estonia*

<p>Binary Logic vs. Fuzzy Logic Techniques for Tuning Robust Controllers Valery Vodovozov, <i>TalTech, Estonia</i></p>
<p>Teaching Power Electronics Using Object-Oriented Approach Zoja Raud, <i>TalTech, Estonia</i></p>
<p>13:00-14:00 – Lunch</p>
<p>14:00-15:30 – Invited Speeches ELECTRICAL MACHINES AND DRIVES Chairman: Prof. Alecksey Anuchin, Co-Chairman: Dr. Ants Kallaste</p>
<p>Operation and Principles of Bearingless Synchronous Reluctance Machines Anouar Belahcen, <i>Aalto University, Finland</i></p>
<p>Conceptual Design of Electrical Machines Istvan Vajda, <i>Obuda University, Hungary</i></p>
<p>Condition Monitoring of Electrical Machines and its Relation to IoT Toomas Vaimann, <i>TalTech, Estonia</i></p>
<p>Direct Drive Planar Motion Systems with Parallel Kinematics Lev Rassudov, <i>Moscow Power Engineering Institute, Russian Federation</i></p>
<p>Oversampled MPC with Sinc3-filter for Continuous Control of an IPM Motor Alecksey Anuchin, <i>Moscow Power Engineering Institute, Russian Federation</i></p>
<p>3D Printed Electrical Machines Ants Kallaste, <i>TalTech, Estonia</i></p>
<p>15:30-16:00 – Coffee</p>
<p>16:00-17:00 – Invited Speeches POWER ENGINEERING AND SMART GRIDS Chairman: Prof. Argo Rosin, Co-Chairman: Dr. Roya Ahmadi</p>
<p>Local Energy Router for Peer-to-Peer Trading Between Prosumers in a Smart Community Carlos Roncero-Clemente, <i>University of Extremadura, Spain</i></p>
<p>Possible Uses of Blockchain Technology in the Power Markets Hannes Agabus, <i>TalTech, Estonia</i></p>
<p>State of The Art in Research on Microgrids Realtime Studies Roya Ahmadi Ahangar, <i>TalTech, Estonia</i></p>
<p>Embedded System Design in Smart System Integration: from Open Source Hardware to Open Source Science Manfred Glesner, <i>Technische Universität Darmstadt, Germany</i></p>
<p>17:00-19:00 – Special Session PhD THESES PRE-DEFENCE PRESENTATIONS Chairman: Prof. Manfred Glesner, Co-Chairman: Dr. Oleksandr Husev</p>
<p>Quazi-Z-Source Based String Inverter for Residential Photovoltaic Application Elena Santasheva, <i>TalTech, Estonia</i></p>

Design and Implementation of Intellectual Fuzzy Regulators and Observers for Multidimensional Motor Driven Applications

Andrei Aksjonov, *TalTech, Estonia*

Research and Development of Search Based Auction Algorithm and Simulator for Microgrids

Tarmo Korõtko, *TalTech, Estonia*

Thermal Analysis of Permanent Magnet Assisted Reluctance Machine for Traction Application

Payam Shams Ghahfarokhi, *TalTech, Estonia*

19:00-20:00 - Dinner

20:00-23:00 – Social Event: International Evening

JANUARY 17, 2019

9:00-11:00 – Regular Session

ELECTRICAL MACHINES - I

Chairman: Dr. Lev Rassudov, Co-Chairman: Dr. Anton Rassõlkin

Winding Function Based Analytical Model of Squirrel Cage Induction Motor for Fault Diagnostics

Bilal Asad, *TalTech, Estonia*

Practical Implementation of Optimal Control of a Autooperator to Eliminate Vibrations

Siarhei Autso, *Belarusian State Technological University, Belarus*

A Method for Efficiency Determination of Permanent Magnet Synchronous Motor

Karolis Dambrauskas, *Kaunas University of Technology, Lithuania*

Investigation of Modular Motor for Wheelchair Application

Rahims Geidarovs, *Riga Technical University, Latvia*

A Novel Vector Control Strategy for Six-Phase Induction Motor with Low Torque Ripples and Harmonic Currents

Hamidreza Heidari, *TalTech, Estonia*

An Overview of Losses and Control Technique of Permanent Magnet Assisted Synchronous Reluctance Machine

Galdi Hysa, *Polytechnic University of Tirana, Albania*

Tentative Evaluation of Power and Configuration of Electrical Drive for Cost-Effective Power Assist Wheelchair

Ilya Galkin, *Riga Technical University, Latvia*

Estimation of the Required Voltage for Improved MTPA Algorithm

Alexander Popov, *Ogarev Mordovia State University, Russian Federation*

11:00-13:00 – Regular Session**POWER ELECTRONICS - I****Chairman: Prof. Ilya Galkin, Co-Chairman: Dr. Andrii Chub****Power Electronics in Electrical Drive of Assisting Power Wheelchair**Alexander Bubovich, *Riga Technical University, Latvia***Study of 1.2 kV RB-IGBTs under Different Switching Conditions**Oleksandr Korkh, *TalTech, Estonia***An Improved Snubber Circuit for Auxiliary Resonant Commutated Pole Converters with Auxiliary Thyristors**Matthijs Heuvelmans, *KTH, Sweden***Model Predictive Control with Less Switching Commutation for the Quasi-Z-Source Inverter**Wenjie Liu, *Aalborg University, Denmark***Model Predictive Control of Novel Buck-Boost Inverter with Unfolding Circuit**Oleksandr Matiushkin, *TalTech, Estonia/Chernihiv National University of Technology, Ukraine***Accurate Load Identification Algorithm for LV side of Solid-State Transformer**Mariusz Michna, *Warsaw University of Technology, Poland***Control of DC/AC Full Bridge Inverter**Mahdiyyeh Najafzadeh, *TalTech, Estonia***Novel Inductive Power Transfer Approach based on Z-Source Network**Bohdan Pakhaliuk, *Chernihiv National University of Technology, Ukraine***13:00-14:00 – Lunch****14:00-15:30 Regular Session****POWER ENGINEERING AND SMART GRIDS - I****Chairman: Dr. Hannes Agabus, Co-Chairman: Dr. Elizaveta Liivik****Modifying Price Based Set Point Calculation Algorithms for Use in Off-Grid Mode**Tobias Häring, *TalTech, Estonia***Modeling of Lighting Load for the Residential Building**Muhammad Naveed Iqbal, *TalTech, Estonia***Test Method for Determining Radiation Absorptivity and Emissivity Coefficients of ACSR Conductors**Ivar Kiitam, *TalTech, Estonia***Thoughts on Conversion of Static Load Models**Madis Leinakse, *TalTech, Estonia***Preliminary Analysis of PMU Measurements for Power Quality Assessment**Mari Löper, *TalTech, Estonia***Second Year PhD Studies: Study of Ventilation Control**Vahur Maask, *TalTech, Estonia***15:30-16:00 – Coffee**

16:00-18:00 – Regular Session

ELECTRICAL ENGINEERING - I

Chairman: Dr. Oleksandr Bondarenko, Co-Chairman: Dr. Carlos Roncero-Clemente

Analysis of Building Sensor Data to Explain the Experienced Indoor Room Temperature

Cletus Crasta, *TalTech, Estonia*

Increasing Robot Performance by Optimizing the Desired Trajectory and Selecting the Optimal Movement Speed of Robot Gripper

Nikolay Fedortsov, *Moscow Power Engineering Institute, Russian Federation*

Evaluation of the Total Losses in Principal Units of Micro Resistance Welding Machine Power Supplies

Tetiana Karbivska, *Igor Sikorsky Kyiv Polytechnic Institute, Ukraine*

Research and Development of the High Power Electroporation System for Mass Transfer in Food Treatment Applications

Sebastjanas Kurcevskis, *Vilnius Gediminas Technical University, Lithuania*

General Procedure to Identify Supercapacitor Models Parameters

Henry Miniguano, *Universidad Carlos III de Madrid, Spain*

First Step Report on Power-Assist Wheelchair Battery Development

Deniss Nikonorovs, *Riga Technical University, Latvia*

Edge Computing Gateway for Industrial Internet of Things

Julius Skirelis, *Vilnius Gediminas Technical University, Lithuania*

Scrum-HE – Agile Teaching and Learning Process in Engineering

Martina Müller-Amthor, *University of Applied Sciences Kempten, Germany*

19:00-20:00 – Dinner

21:00-24:00 – Social Event: IEEE-IES Students and Young Professionals' Night

JANUARY 18, 2019

9:00-11:00 – Regular Session

ELECTRICAL MACHINES - II

Chairman: Prof. Alecksey Anuchin, Co-Chairman: Dr. Toomas Vaimann

Achieving Maximum Accuracy of Speed Estimation Using Incremental Encoder

Yulia Kazemirova, *Moscow Power Engineering Institute, Russian Federation*

Design of PMSM Winding with Low Harmonic Content by the Usage of Reduced Schwarz-Christoffel Conformal Mapping

Jan Laksar, *University of West Bohemia, Czech Republic*

<p>The Improvement of Power Factor and Torque for Synchronous Reluctance Machine Abhisek Majumder, <i>TalTech, Estonia</i></p>
<p>Implementation Issues and Considerations for a FOC of an IM using Speedgoat Jaime Pando-Acedo, <i>Universidad de Extremadura, Spain</i></p>
<p>Impact of Thermal Conductivity of Stator in Axial Direction on the Overall Thermal Model of High-Speed Synchronous Motor Lukas Veg, <i>University of West Bohemia, Czech Republic</i></p>
<p>Material Properties for 3D Printing Electrical Machines Hans Tiismus, <i>TalTech, Estonia</i></p>
<p>Torque Prediction of Permanent Magnet Synchronous Motor Using Artificial Neural Networks Tomas Zimnickas, <i>Kaunas University of Technology, Lithuania</i></p>
<p>The Voltage Constraints Implementation for Ramp Torque Control of FOC Induction Motor Viktoriya Popova, <i>Ogarev Mordovia State University, Russian Federation</i></p>
<p>11:00-13:00 – Regular Session POWER ELECTRONICS - II Chairman: Prof. Andres Barrado, Co-Chairman: Dr. Serhii Stepenko</p>
<p>Advanced Current-Limiting Droop Control for Power Inverters Alexandros Paspatis, <i>University of Sheffield, United Kingdom</i></p>
<p>AC Supply Power Parameters Enhancement Solution for Frequency Converter Ricards Porins, <i>Riga Technical University, Latvia</i></p>
<p>Wireless Charging Solutions for Autonomous Industrial Systems Denys Zinchenko, <i>Taltech, Estonia</i></p>
<p>Isolated DC-DC Converters Testing – Automated Workbench Proposition Cezary Soból, <i>Warsaw University of Technology, Poland</i></p>
<p>Comparative Analysis of AC Choppers used in Sag/Swell Compensation Circuits Marcis Prieditis, <i>Riga Technical University, Latvia</i></p>
<p>Development of Three-Level Neutral-Point-Clamped Inverter Agris Treimanis, <i>Riga Technical University, Latvia</i></p>
<p>Estimation of the Parameters of a Matching Transformer for a Bidirectional Two-Stage DC/DC Converter with Separated Commutation for the Power Supply System of the DC Railway with Battery Energy Storage System Vladyslav Tykhomyrov, <i>National Technical University “Kharkiv Polytechnic Institute”, Ukraine</i></p>
<p>MHSN Modulation Method for High-Frequency SiC-based ZSIs Kornel Wolski, <i>Warsaw University of Technology, Poland</i></p>
<p>13:00-14:00 - Lunch</p>
<p>14:00-16:00 – Regular Session POWER ENGINEERING AND SMART GRIDS - II Chairman: Prof. Ivo Palu, Co-Chairman: Prof. Serhii Ivanets</p>

<p>Main Factors Affecting Power Transformer Maintenance Period Vilius Malažinskas, <i>Kaunas University of Technology, Lithuania</i></p>
<p>Overview of Control and Management Strategies Developed for a Nanogrid of Residential Prosumers Mercedes Ruiz-Cortés, <i>University of Extremadura, Spain</i></p>
<p>Power Transformer Insulation Aging Analysis in Photovoltaic Power Stations Jonas Vaišnys, <i>Kaunas University of Technology, Lithuania</i></p>
<p>Testing Different Power System Out-of-Step Detection Algorithms Marko Tealane, <i>TalTech, Estonia</i></p>
<p>Black Start of Microgrids Andreas Armstorfer, <i>University of Applied Sciences Kempten, Germany/TalTech, Estonia</i></p>
<p>Study of the Electrical Behavior of Superconductive Tapes Joints Adriana Mar, <i>CTS-UNINOVA, Portugal</i></p>
<p>Advanced Sensors and On-line Measurements for Power Lines in Smart Grids Noman Shabbir, <i>TalTech, Estonia</i></p>
<p>Smart Heritage City Applications for Heritage Management Fernando Monteiro, <i>NOVA School of Science and Technologies, CTS Uninova, Portugal</i></p>
<p>16:00-16:30 – Coffee</p>
<p>16:30-18:00 – Regular Session ELECTRICAL ENGINEERING - II Chairman: Prof. Joao Martins, Co-Chairman: Dr. Indrek Roasto</p>
<p>Electric Transport Electrical Braking Energy Accumulation Efficiency of Supercapacitor Storage System Considering Aging-Related Deterioration Girts Stana, <i>Riga Technical University, Latvia</i></p>
<p>Testing the Characteristics of Phasor Measurement Units Using Real-Time Digital Simulator Tarmo Trummal, <i>TalTech, Estonia</i></p>
<p>Development of New Requirements for Outdoor Advertisement Screens Toivo Varjas, <i>TalTech, Estonia</i></p>
<p>Measurements of Electromechanical Forces in Superconducting Fault Current Limiters Tapes under Short Circuit Conditions Nuno Vilhena, <i>NOVA University of Lisbon – FCT NOVA/CTS/UNINOVA, Portugal</i></p>
<p>Control System for Smart Wheelchair with Deep Learning Neural Network Maksims Vorobjovs, <i>Riga Technical University, Latvia</i></p>
<p>Cost-Effective Design of Modular Multilevel Converter Employing Full-Bridge Submodules Jiapeng Yin, <i>University of Seville, Spain</i></p>
<p>20:00-23:00 – Gala Dinner and Awards Ceremony</p>