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PROGRAM

JANUARY 15, 2018
12:30-13:30 – Lunch
13:00-14:00 – Registration
14:00-15:00 - Opening Ceremony
Welcome Speech and Symposium Information from General Chairman Dr. Dmitri Vinnikov, <i>General Chairman of the Symposium, TTÜ</i>
New in Regulations Regarding to PhD Studies in TTÜ: Action Plan, Attestation and Thesis Defence Dr. Argo Rosin, <i>Vice-Dean for Research of the School of Engineering, TTÜ</i>
A Year Later - Department of Electrical Power Engineering and Mechatronics of TTÜ Prof. Ivo Palu, <i>Head of the Department of Electrical Power Engineering and Mechatronics, TTÜ</i>
15:00-16:00 – Invited Speeches <i>PART I</i> Chairman: Prof. Ivo Palu, Co-Chairman: Dr. Elizaveta Liivik
What the IEEE Industrial Electronics Society Can Do for You Prof. Antonio Luque, <i>IEEE-IES VP Workshop Activities, University of Seville, Spain</i>
Development of ELEON Direct Drive Wind Turbine Oleg Sõnajalg, <i>Eleon AS, Estonia</i>
16:00-16:30 - Coffee
16:30-18.00 – Invited Speeches <i>PART II</i> Chairman: Prof. Antonio Luque, Co-Chairman: Prof. Luigi Piegari
General Perspective of Current and Future Power Electronics Prof. Jose I. Leon, <i>University of Seville, Spain</i>
Sustainable Manufacturing for the Factories of the Future Prof. Minna Lanz, <i>Tampere University of Technology, Finland</i>
The rebirth of hardware: Open-Source Hardware Initiatives for IoT- and Stem-Based Developments Prof. Manfred Glesner, <i>Technische Universität Darmstadt, Germany</i>
20:00-23:00 – Welcome Reception

JANUARY 16, 2018

9:00-10:00 – Invited Speeches

MECHANICAL ENGINEERING AND MECHATRONICS

Chairman: Prof. Tauno Otto, Co-Chairman: Dr. Klodian Dhoska

Rapid Reconfiguration of Flexible Production Systems Through Capability-Based Adaptation, Auto-configuration and Integrated Tools for Production Planning

Prof. Minna Lanz, *Tampere University of Technology, Finland*

Modeling and Simulation of Two-DoF Parallel Platform Using Multibody Approach

Prof. Didier Pascault, *UPJV – Amiens, France*

Characterization of Metal Matrix Composite by Increasing Magnesium Content

Dr. Klodian Dhoska, *Polytechnic University of Tirana, Albania*

10:00-11:30 – Regular Session

MECHANICAL ENGINEERING AND MECHATRONICS - I

Chairman: Prof. Minna Lanz, Co-Chairman: Prof. Trieu Minh Vu

VR/AR applications for Robotics

Vladimir Kuts, *Tallinn University of Technology, Estonia*

An IoT-based Approach to Digitalize a Manufacturing System

Kashif Mahmood, *Tallinn University of Technology, Estonia*

Algorithm for Calculating the Constancy Parameter of the Musculoskeletal System

Maria Kurenkova, *ITMO University, Russian Federation*

Modeling and Simulation of Dynamic Contact Atomic Force Microscope

Mohammad Reza Bahrani, *Peter the Great St. Petersburg Polytechnic University, Russian Federation*

Formulation of the Problem and Solving the Problem about Forced Vibration of Windmill with Rotor Out-of-Balance

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

Optimal Decision-Making Process in Industrial Robot Selection

Tavo Kangru, *Tallinn University of Technology, Estonia*

11:30-13:00 – Regular Session

MECHANICAL ENGINEERING AND MECHATRONICS - II

Chairman: Prof. Didier Pascault, Co-Chairman: Prof. Margarita Skotnikova

Improvement on the Mechanical Properties of AA 6063 Aluminum Alloy by Means of Heat Treatment

Eviola Spaho, *Polytechnic University of Tirana, Albania*

Recuperation Mechanisms Based on Elastic Elements

Nuzhdin Kirill, *ITMO University, Russian Federation*

Prediction of Turbine Blades Resonance Vibrations with Account for Geometric Features and Centrifugal Forces

Artem Moskalets, *Peter the Great St. Petersburg Polytechnic University, Russian Federation*

The Influence of Supercritical Airfoil Trailing Edge Modifications on the Characteristics of Aerodynamics

Peep Lauk, *Tallinn University of Technology, Estonia*

Local Models of the Musculoskeletal System Mikhail Erofeev, <i>ITMO University, Russian Federation</i>
Composite Winding Control Alexey Kutin, <i>ITMO University, Russian Federation</i>
13:00-14:00 – Lunch
14:00-14:30 – Tutorial RESEARCH ARTICLE WRITING: CHALLENGES TO DOCTORAL STUDENTS Mare-Anne Laane, <i>Tallinn University of Technology, Estonia</i>
14:30-16:15 – Special Session PhD THESES PRE-DEFENCE PRESENTATIONS Chairman: Prof. Istvan Vajda, Co-Chairman: Prof. Manfred Glesner
Novel Naturally Clamped Full-Soft Switching Galvanically Isolated Bidirectional DC-DC Converters Roman Kosenko, <i>Tallinn University of Technology, Estonia</i>
Adaptive Control System for the Electroplating Process Siarhei Autso, <i>Belarusian State Technological University, Belarus</i>
The Control System of an Unmanned Aerial Vehicle Using the Theory of Fuzzy Sets Andrei Shumski, <i>Belarusian State Technological University, Belarus</i>
High-Efficiency Bidirectional DC-DC Converter with Integrated Battery Storage for Low-Power PV Applications Kostiantyn Tytelmaier, <i>Chernihiv National University of Technology, Ukraine</i>
Research and Development of Vibro-Acoustic Methods to Diagnose Malfunctions of Power Transformers Mikhail Lunikin, <i>Pskov State University, Russian Federation</i>
16:15-16.45 – Coffee
16.45-18:00 – Special Session PROGRESS REPORTS of PhD CANDIDATES Chairman: Prof. Valery Vodovozov, Co-Chairman: Dr. Oleksandr Husev
Overview of Advanced Functionalities for Residential Photovoltaic Inverter Connected to the Grid Elena Makovenko, <i>Tallinn University of Technology, Estonia</i>
Indirect and Direct Embedded MPC Algorithms for Power Electronics Control Problems Mattia Rossi, <i>Politecnico di Milano, Italy</i>
Fluidized Bed Pyrolysis as a New Approach in Oil Shale Retorting Heliis Pikkor, <i>Tallinn University of Technology, Estonia</i>
Transactive Energy Systems Vasco Delgado-Gomes, <i>CTS-Uninova, FCT NOVA, Portugal</i>
Current Power System Protection in Low Inertia Conditions Marko Tealane, <i>Tallinn University of Technology, Estonia</i>
18:00-19:00 – Dinner
20:00-23:00 – Social Event: Exploring Hidden Treasures of Kuressaare (Outdoor activity)

JANUARY 17, 2018

09:00-11:00 – Tutorials

POWER ELECTRONICS AND ELECTRICAL ENGINEERING - I

Chairman: Prof. Jose I. Leon, Co-Chairman: Dr. Sertac Bayhan

Comprehensive Comparative Analysis of Impedance-Source Based Converters

Dr. Oleksandr Husev, *Tallinn University of Technology, Estonia*

Impedance-Source DC-DC Converter Topologies - Versatile Solution for Distributed Energy Generation Systems

Dr. Andrii Chub, *Tallinn University of Technology, Estonia*

Quasi-Z-Source Inverters in Fault Tolerant Condition

Prof. Victor Pires, *Polytechnic Institute of Setúbal, Portugal*

Possibilities of Energy Management Systems in Residential Applications

Prof. Enrique Romero-Cadaval, *University of Extremadura, Spain*

Optimized Design of Dual Active Bridge Converters

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

PCB Design Consideration for Bidirectional DC-DC Power Converter Based on GaN Transistors

Prof. Oleksandr Velihorskyi, *Chernihiv National University of Technology, Ukraine*

11:00-13:00 – Tutorials

POWER ELECTRONICS AND ELECTRICAL ENGINEERING - II

Chairman: Prof. Enrique Romero-Cadaval, Co-Chairman: Prof. Victor Pires

MEMS for the Internet of Things

Prof. Antonio Luque, *University of Seville, Spain*

Dynamic and Ageing Models of Batteries for Application Oriented Design

Prof. Luigi Piegari, *Politecnico di Milano, Italy*

From Linear Control to Model Predictive Control in Power Electronics: Why Should I Consider it for the Next Time?

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

Finite-Control-Set Model-Predictive Control for a Quasi-Z-Source Four-Leg Inverter Under Unbalanced Load Condition

Dr. Sertac Bayhan, *Texas A&M University at Qatar, Qatar*

Discretization Methods of the Non-Ideal Resonant Controllers

Dr. Carlos Roncero-Clemente, *University of Extremadura, Spain*

On the Use of Smart Meters for Power Quality Enhancement

Prof. Joao Martins, *FCT/UNL – UNINOVA, Portugal*

13:00-14:00 – Lunch

14:00-15:30 – Tutorials

MECHATRONICS AND MECHANICAL ENGINEERING

Chairman: Prof. Tauno Otto, Co-Chairman: Dr. Galina Tsvetkova

Seamless Human-Robot Interaction

Prof. Minna Lanz, *Tampere University of Technology, Finland*

Design of a Wearable Mechatronic Brace

Prof. Trieu Minh Vu, *Tallinn University of Technology, Estonia*

Innovative Methods for Implementing Interdisciplinary in Career Counseling (imate ii)

Eduard Ševtšenko, *Tallinn University of Technology, Estonia*

Tool Wear at High-Speed Cutting

Prof. Margarita Skotnikova, *Peter the Great St. Petersburg Polytechnic University, Russian Federation*

Tribotechnical Properties of Surfacing Materials Used in Geotechnology

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

15:30-16:00 – Coffee

16:00-18:00 – Tutorials

ELECTRICAL MACHINES AND ELECTRICAL DRIVES

Chairman: Prof. Alecksey Anuchin, Co-Chairman: Dr. Ants Kallaste

Electrical Motor-Drives Control from the Standpoint of Life-Cycle Assessment

Anton Rassõlkin, *Tallinn University of Technology, Estonia*

Multidisciplinary Design Optimization of Electrical Machines

Istvan Vajda, *Óbuda University, Hungary*

Faults and Monitoring of Reluctance Machines

Toomas Vaimann, *Tallinn University of Technology, Estonia*

Autonomous Charging System for Self-Driving Car

Levon Gevorgov, *Tallinn University of Technology, Estonia*

Additive Manufacturing of Electrical Machines

Ants Kallaste, *Tallinn University of Technology, Estonia*

Comparative Analysis of Traction Drives in Terms of Power Converter Cost

Alecksey Anuchin, *Moscow Power Engineering Institute, Russia*

18:00-19:00 - Dinner

20:00-23:00 – Social Event: International Evening (Conference room of SPA Hotel Meri)

JANUARY 18, 2018

9:00-10:00 – Invited Speeches

ELECTRICAL ENGINEERING

Chairman: Prof. Marius Klytta, Co-Chairman: Dr. Oleksandr Bondarenko

Circuit Analysis in Domain of Two Variables

Prof. Marius Klytta, *TH Mittelhessen University of Applied Sciences, Germany*

Modelling a Blended Braking System of Electric Vehicles

Dr. Valery Vodovozov, *Tallinn University of Technology, Estonia*

Highly Efficient Converters for Resistance Welding

Dr. Oleksandr Bondarenko, *National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Ukraine*

Reduction of Academic Dishonesty in Learning Engineering Courses

Dr. Zoja Raud, *Tallinn University of Technology, Estonia*

10:00-11:30 Regular Session

POWER AND ELECTRICAL ENGINEERING - I

Chairman: Prof. Ivo Palu, Co-Chairman: Dr. Argo Rosin

Power Transformer Working Regime Analysis in Photovoltaic Power Stations

Jonas Vaisnys, *Kaunas University of Technology, Lithuania*

Review on Power Systems Resilience

Adriana Mar, *FCT/UNL – UNINOVA, Portugal*

Investigation of Influence of Short Duration Overvoltage Disturbances on Partial Discharge Characteristics

Vilius Malazinskas, *Kaunas University of Technology, Lithuania*

Sizing and Optimization of the Electrical Power Distribution System in Fuel Cell Electrical Vehicles

Alberto Martin Lozano, *Universidad Carlos III de Madrid, Spain*

Comparison of Different Charge and Discharge Strategies of Batteries in Microgrids of Prosumers

Mercedes Ruiz-Cortés, *University of Extremadura, Spain*

On-Line Monitoring of Power System Inertia Based on Wide Area Measurements

Kaur Tuttelberg, *Tallinn University of Technology, Estonia*

11:30-13:00 Regular Session

POWER AND ELECTRICAL ENGINEERING - II

Chairman: Prof. Joao Martins, Co-Chairman: Prof. Vitor Pires

Energy Storage Control Strategy for Flattening Output Power of a Wind Farm

Bartosz Wańkiewicz, *University of Zielona Góra, Poland*

Reactive Power Sharing and Voltage Control for Islanded Microgrids at Low Voltage Level

Jorge Luis Helguero Cruz, *Tallinn University of Technology, Estonia*

Medium Voltage Power Cable and Joint Temperatures in High Current Tests

Ivar Kiitam, *Tallinn University of Technology, Estonia*

MIGRATE – Research Enabling 100% Renewable Generation in Future Power Systems

Mari Löper, *Tallinn University of Technology, Estonia*

Preliminary Study on Comparative Load Modelling in PSS/E and PSCAD

Madis Leinakse, *Tallinn University of Technology, Estonia*

Generation-Side Real-Time Energy Pricing Control

Ievgen Pichkalov, *Central Ukrainian National Technical University, Ukraine*

13:00-14:00 – Lunch

14:00-18:00 – SEMINAR OF THE IEEM WORKGROUP OF THE ESTONIAN CENTER OF EXCELLENCE IN ZERO ENERGY AND RESOURCE EFFICIENT SMART BUILDINGS AND DISTRICTS (ZEBE)

Chairman: Dr. Dmitri Vinnikov, Co-Chairman: Dr. Argo Rosin

18:00-19:00 – Dinner

20:00-21:00 – Open Discussion: IS IT POSSIBLE TO DEMYSTIFY THE NATURE OF ELECTRICITY?

Moderator Prof. Jaan Järvik

JANUARY 19, 2018

9:00-11:00 – Regular Session

ELECTRICAL MACHINES - I

Chairman: Prof. Anouar Belahcen, Co-Chairman: Prof. Alecksey Anuchin

Bearingless Synchronous Reluctance Machines

Prof. Anouar Belahcen, *Aalto University, Finland*

Current Density Distribution FEM Modeling in YBCO Bulks with Y-211 Particles

Pawel Lasek, *Silesian University of Technology, Poland*

Research of Pump Genius Application for Water Pump Motors Control

Karolis Dambrauskas, *Kaunas University of Technology, Lithuania*

Reducing Sparking Caused by the Parametric Modulation in Sliding Electric Contact Unit of Synchronous Machine

Oksana Kozyreva, *Pskov State University, Russian Federation*

Estimation of the Requirements for Hybrid Electric Powertrain Based on Analysis of Vehicle Trajectory Using GPS and Accelerometer Data

Egor Kulik, *Moscow Power Engineering Institute, Russian Federation*

Improving the Dynamic Response of FOC Induction Machines Operated with Reduced Rotor Flux

Viktoriya Lapshina, *National Research Mordovia State University, Russian Federation*

Analysis of a Three-Phase Induction Motor Using the Dynamic State Space Model

Bilal Asad, *Tallinn University of Technology, Estonia*

Thermal Models Based Power Module Temperature Monitoring in AC Drives

Alexander Popov, *National Research Mordovia State University, Russian Federation*

11:00-13:00 – Regular Session

POWER ELECTRONICS - I

Chairman: Prof. Ilya Galkin, Co-Chairman: Dr. Andrii Chub

Evaluation of Efficiency of Different Types of Low-Voltage DC-DC Converters (Simulation Case)

Alexander Bubovich, *Riga Technical University, Latvia*

PWM Strategy with Switching Losses Minimization for 3-Level T-Type Voltage Source Inverter

Maria Gulyaeva, *Moscow Power Engineering Institute, Russian Federation*

A Modular Medium Voltage IGCT Gate Driver Supply

Matthijs Heuvelmans, *KTH, Sweden*

Boundaries of Switching Loss Elimination in SiC-based Voltage-Source Inverters with SV-PWM Modulation Methods

Kornel Wolski, *Warsaw University of Technology, Poland*

Analysis and Comparison of High-Frequency Link Converter Topologies

Oleksandr Korkh, *Tallinn University of Technology, Estonia*

A Simple Closed-Loop Active Thermal Control via Power Routing of Parallel DC-DC Converters

Abraham Marquez, *Universidad de Sevilla, Spain*

Novel Family of Single-Stage Buck-Boost Inverters Based on Unfolding Circuit

Oleksandr Matiushkin, *Chernihiv National University of Technology, Ukraine*

<p>Modified Dual Active Bridge Bidirectional Converter Alba Rodríguez-Lorente, <i>University Carlos III of Madrid, Spain</i></p>
<p>13:00-14:00 - Lunch</p>
<p>14:00-15:00 – Regular Session ELECTRICAL MACHINES - II Chairman: Dr. Anton Rassõlkin, Co-Chairman: Dr. Toomas Vaimann</p>
<p>Thermal Model of a Synchronous Reluctance Motor Payam Shams Ghahfarokhi, <i>Tallinn University of Technology, Estonia</i></p>
<p>Motor Bearing Fault Diagnosis using Artificial Neural Networks Tomas Zimnickas, <i>Kaunas University of Technology, Lithuania</i></p>
<p>Force Test Bench for 3D Printed Vibrotactile Actuator with Permanent Magnet Maxim Vorobyov, <i>Riga Technical University, Latvia</i></p>
<p>Comparative Study of Sensorless Techniques for a PMSM Jaime Pando-Acedo, <i>Universidad de Extremadura, Spain</i></p>
<p>15:00-16:15 – Regular Session POWER ELECTRONICS - II Chairman: Prof. Andres Barrado, Co-Chairman: Prof. Sergio Pires Pimentel</p>
<p>Winding Design of Inductors for Dual Active Bridge Converters Zhan Shen, <i>Aalborg University, Denmark</i></p>
<p>AC/DC Converters for System with DC-link Yurii Voitovych, <i>National Technical University "Kharkiv Polytechnic Institute", Ukraine</i></p>
<p>Enhancing the Performance of Modular Multilevel Converters using a Simple Model Predictive Control Strategy Jiapeng Yin, <i>University of Seville, Spain</i></p>
<p>Reliability Evaluation of an Impedance-Source PV Microconverter Yanfeng Shen, <i>Aalborg University, Denmark</i></p>
<p>Modular Multilevel Converters for Automotive Applications Davide De Simone, <i>Politecnico di Milano, Italy</i></p>
<p>16:15-16:45 – Coffee</p>
<p>16:45-18:30 – Regular Session ELECTRICAL ENGINEERING Chairman: Prof. Oleksandr Velihorskyi, Co-Chairman: Dr. Carlos Roncero-Clemente</p>
<p>End-User Electricity Consumption Modelling for Power Quality Analysis of Residential Buildings Muhammad Naveed Iqbal, <i>Tallinn University of Technology, Estonia</i></p>
<p>A Novel Human-Machine Interface Evaluation Methodology for Passenger Vehicles Andrei Aksjonov, <i>Tallinn University of Technology, Estonia</i></p>
<p>Overview of Energy Management Systems for Net Zero Energy Buildings Vahur Maask, <i>Tallinn University of Technology, Estonia</i></p>

A Concept of Trolleybus Virtual Modeling for Energy Consumption Reduction Planning

Girts Stana, *Riga Technical University, Latvia*

Algorithm for Unmanned Aerial Vehicle to Supervise Applications for Civil and Power Engineering Tasks

Gunta Strupka, *Riga Technical University, Latvia*

The Problems of Reliability Assessment of Modular Converter Topologies

Oleksandr Kaloshyn, *National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Ukraine*

Defining the Light-Technical Parameters and Applying the Recommended Measuring Methods for Creating the Smart Crossings

Toivo Varjas, *Tallinn University of Technology, Estonia*

20:00-23:00 – Gala Dinner and Awards Ceremony