

SYMPOSIUM PROGRAM



JANUARY 14, 2013
12:30-13:30 - Lunch
13:00-14:00 - Registration
14:00-14:15 - Opening Ceremony Dmitri Vinnikov, <i>General Chairman</i> Tõnu Lehtla, <i>Chairman of the Council of EGDK-II, Tallinn University of Technology</i>
14:15-16:00 – SPECIAL SESSION IN MEMORIAM OF PROF. JUHAN LAUGIS Chairman: Dr. Raivo Teemets, Co-Chairman: Prof. Tõnu Lehtla
16:00-16:15 - Coffee
16:15-18:15 – PhD Thesis Defence Irena Milashevski, <i>Dept. of Electrical Drives and Power Electronics, Tallinn University of Technology</i> Research and Development of Electronic Ballasts for Smart Lighting Systems with Light Emitting Diodes Supervisors: Prof. Ilya Galkin, <i>Riga Technical University, Latvia</i> Dr. Raivo Teemets, <i>Tallinn University of Technology, Estonia</i> Dr. Jelena Armas, <i>Elektrilevi OÜ, Estonia</i> Opponents: Prof. Enrique Romero-Cadaval, <i>University of Extremadura, Spain</i> Prof. Ivars Rankis, <i>Riga Technical University, Latvia</i>
20:00-23:00 – Welcome Reception

JANUARY 15, 2013

09:00-12:00 – Tutorials

ELECTRICAL DRIVES AND ELECTRICAL MACHINES

Chairman: Prof. Anouar Belahcen, Co-Chairman: Dr. Marek Jasinski

Diagnostics of Power Converters for Electrical Drives

Prof. Vanja Ambrozic, *University of Ljubljana, Slovenia*

Electrical Machine Losses and Efficiency Considerations

Prof. Anouar Belahcen, *Tallinn University of Technology, Estonia / Aalto University, Finland*

Simulation, Modelling and Virtual Testing of Electric Drive Powered Mechatronic Systems

Dr. Tuomo Lindh, *Lappeenranta University of Technology, Finland*

Potential Formulations in Magnetics Applying the Finite Element Method

Dr. Miklós Kuczmann, *Szechenyi Istvan University, Hungary*

Scientific Platforms to Explore and Test the Drives of Electric Cars

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

Modelling of Direct Current and Alternative Current Electric Drives

Prof. Roma Rinkeviciene, *Vilnius Gediminas Technical University, Lithuania*

12:00-13:00 - Invited Speech

EMBEDDED SYSTEM DESIGN FOR SMART SYSTEM INTEGRATION

Prof. Manfred Glesner, *Technische Universität Darmstadt, Germany*

13:00-14:00 - Lunch

14:00-15:30 – Tutorials

POWER ELECTRONICS

Chairman: Prof. Ilya Galkin, Co-Chairman: Prof. Enrique Romero-Cadaval

Hybrid Technology in Mobile Working Machines

Dr. Pertti Silventoinen, *Lappeenranta University of Technology, Finland*

High Power Density Converters

Dr. Andrei Blinov, *Tallinn University of Technology, Estonia*

Control of AC-DC-AC Power Electronics Converter for Renewable Energy Sources - Selected Issues

Dr. Marek Jasinski, *Warsaw University of Technology, Poland*

15:30-15:45 - Coffee

<p>15:45-18:30 – Special Session EDUCATIONAL ASPECTS Chairman: Prof. Johannes Steinbrunn, Co-Chairman: Dr. Zoja Raud</p>
<p>Changing Approaches to Pronoun Use in Research Writing Mare-Anne Laane, <i>Tallinn University of Technology, Estonia</i></p>
<p>Doctoral Studies in a Finnish Doctoral School Dr. Pia Lindh, <i>Lappeenranta University of Technology, Finland</i></p>
<p>Study Course of Switching Converters for Master Students of RTU Prof. Ivars Rankis, <i>Riga Technical University, Latvia</i></p>
<p>Section for Lighting Technology of the Estonian Society of Moritz Hermann Jacobi Dr. Jelena Armas, <i>Tallinn University of Technology, Estonia / Elektrilevi OÜ, Estonia</i></p>
<p>Dual Study Programme "Studium Plus" of the TH Mittelhessen After 10 Years Prof. Marius Klytta, <i>University of Applied Sciences Mittelhessen, Germany</i></p>
<p>Concept Maps as a Tool for Engineering Education Dr. Zoja Raud, <i>Tallinn University of Technology, Estonia</i></p>
<p>18:30-19:30 - Dinner</p>
<p>20:00-23:00 – Social Session</p>

JANUARY 16, 2013

09:00-10:45 – Tutorials

MECHATRONICS AND MECHANICAL ENGINEERING - I

Chairman: Prof. Tauno Otto, Co-Chairman: Yury Monakhov

Modeling and Simulation of Technical Chain Systems

Dr. Gunnar Grossschmidt, Dr. Mait Harf, *Tallinn University of Technology, Estonia*

Mechatronics Education in Aalto University

Prof. Petri Kuosmanen, Dr. Panu Kiviluoma, *Aalto University, Finland*

10:45-11:00 - Break

11:00-13:00 – PhD Thesis Defence

Robert Hudjakov, *Dept. of Mechatronics, Tallinn University of Technology*

Long-Range Navigation for Unmanned Off-Road Ground Vehicle Using Overhead Imagery

Supervisor: Prof. Mart Tamre, *Tallinn University of Technology, Estonia*

Opponents: Prof. Petri Kuosmanen, *Aalto University, Finland*

Prof. Johannes Steinbrunn, *Hawassa University, Ethiopia*

Prof. Jüri Vain, *Tallinn University of Technology, Estonia*

13:00-14:00 - Lunch

14:00-15:00 – Tutorials

MECHATRONICS AND MECHANICAL ENGINEERING - II

Chairman: Prof. Petri Kuosmanen, Co-Chairman: Yury Monakhov

Modeling the Dynamics of Hydroacoustic Instrument for the Underground Chambers Inspection

Yury Monakhov, *National Research University of Informational Technology, Mechanics and Optics (NRU ITMO), St.Petersburg, Russia*

Vehicle Sideslip Modeling and Estimation

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

Mechatronics Professional Qualifications and about Options for Collaborative Mechatronics Study Programmes

Prof. Mart Tamre, *Tallinn University of Technology, Estonia*

<p>15:00-16:30 – Regular Session MECHATRONICS AND MECHANICAL ENGINEERING - I Chairman: Prof. Mart Tamre, Co-Chairman: Dr. Gennadi Arjassov</p>
<p>Open Source Solutions in High School Mechatronics Kupriyanov Dmitry, <i>National Research University of Informational Technology, Mechanics and Optics (NRU ITMO), St.Petersburg, Russia</i></p>
<p>Metrological Problem Mapping for Coordinate Measuring Machines Klodian Dhoska, <i>Tallinn University of Technology, Estonia</i></p>
<p>Design of Ortheses for Correction of Human Gait Artem Kuznetsov, <i>National Research University of Informational Technology, Mechanics and Optics (NRU ITMO), St.Petersburg, Russia</i></p>
<p>Waste Paper Sorting Using Imaging Spectroscopy Ahti Pölder, <i>Tallinn University of Technology, Estonia</i></p>
<p>Using Optical Tracking Technology to Estimate Cyclical Linear Motion Mikhail Larin, <i>National Research University of Informational Technology, Mechanics and Optics (NRU ITMO), St.Petersburg, Russia</i></p>
<p>Machinery Monitoring as a Part of Higher Level Systems Aleksei Snatkin, <i>Tallinn University of Technology, Estonia</i></p>
<p>16:30-16:45 - Coffee</p>
<p>16:45-18:30 – Regular Session MECHATRONICS AND MECHANICAL ENGINEERING – II Chairman: Prof. Trieu Minh Vu, Co-Chairman: Dr. Gennadi Arjassov</p>
<p>Web-Environment Elaboration for Working with ISO 9001 Documents at Production Enterprise Igor Poljantšikov, <i>Tallinn University of Technology, Estonia</i></p>
<p>Rotor Lifting Force Optimization by Changing Dimensions of Rim Around It Dmitri Aleksandrov, <i>Tallinn University of Technology, Estonia</i></p>
<p>Industrial Product Life Cycle Engineering from Green and Lean Manufacturing Philosophies Perspective by Using TRIZ Tools Viktoria Baškite, <i>Tallinn University of Technology, Estonia</i></p>
<p>Laboratory Testing of Materials for Tunnel Boring Machine Drag Bits Dmitri Katushin, <i>Tallinn University of Technology, Estonia</i></p>
<p>The Calculation of Round Plates Under the Action of Local Loading by Generalized Functions Dmitri Gornostajev, <i>Tallinn University of Technology, Estonia</i></p>
<p>Evaluation of Thermal Insulation Concepts for the Balance of Plant of a Solid Oxide Fuel Cell System Pauli Salminen, <i>Aalto University, Finland</i></p>
<p>Approximation of Limit Amplitudes of Stresses Sergei Žigailov, <i>Tallinn University of Technology, Estonia</i></p>
<p>18:30-19:30 - Dinner</p>
<p>20:00-23:00 – Social Session</p>

JANUARY 17, 2013

09:00-11:00 – Special Session

POWER ELECTRONICS FOR SMART GRIDS

Chairman: Prof. Enrique Romero-Cadaval, Co-Chairman: Dr. Indrek Roasto

Power Electronic Transformer as an Energy Router of Active Power Distribution Grids

Dr. Indrek Roasto, *Tallinn University of Technology, Estonia*

Cooperative Strategies for Controlling Power Electronic Transformers

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

Three-Level Quasi-Z-Source Inverter as Power Electronic Interface for Renewable Energy Systems

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

EV Charging Infrastructure – the Part of Smart Distribution System

Dr. Marcin Jarnut, *University of Zielona Gora, Poland*

11:00-13:00 – Tutorials

MINING ENGINEERING

Chairman: Dr. Heidi Soosalu, Co-Chairman: Dr. Jüri-Rivaldo Pastarus

Seismic Activity on Oil Shale Area

Dr. Heidi Soosalu, *Tallinn University of Technology, Estonia*

Dectonics

Dr. Ülo Sõstra, *Tallinn University of Technology, Estonia*

Application of Numerical Methods for Landfill Slope Stability Analysis

Dr. Justyna Adamczyk, *AGH University of Science & Technology, Poland*

BdU Experiences with Developing and Implementing the Usage of Underground Mine Water for Heat Energy Production with All Aspects in the Mansfeld-Region

Dr. Stefan Kreisel, *Bildungswerk der Unternehmerverbände Sachsen-Anhalt e.V. (BdU), Germany*

13:00-14:00 - Lunch

14:00-15:30 – Special Session

SUSTAINABLE MINING ENGINEERING

Chairman: Dr. Veiko Karu, Co-Chairman: Prof. Ingo Valgma

Sustainable Use of Mineral Resources

Dr. Mall Orru, *Tallinn University of Technology, Estonia*

Sustainable Mining

Prof. Ingo Valgma, *Tallinn University of Technology, Estonia*

Cement Production and Waste Reduction Opportunities

Riho Iskül, *Tallinn University of Technology, Estonia*

Mining Waste Management in Poland

Dr. Justyna Adamczyk, *AGH University of Science & Technology, Poland*

15:30-16:00 - Coffee
16:00-18:00 – Regular Session MINING TECHNOLOGIES Chairman: Dr. Jüri-Rivaldo Pastarus, Co-Chairman: Dr. Mall Orru
Mining Waste Reduction Methods Dr. Veiko Karu, <i>Tallinn University of Technology, Estonia</i>
Backfilling Technologies Dr. Jüri-Rivaldo Pastarus, <i>Tallinn University of Technology, Estonia</i>
Minimizing of Limestone Fines Julia Gulevitš, <i>Tallinn University of Technology, Estonia</i>
Quaternary and Paleozoic Mineral Resources of the Harjumaa County, Estonia Angela Notton, <i>Tallinn University of Technology, Estonia</i>
Stability of Pillars in Drowned Mines Merle Otsmaa, <i>Tallinn University of Technology, Estonia</i>
Mine Blasts in the Aru-Lõuna Limestone Quarry – a Multidisciplinary Study Using Seismology and Mining Engineering Merike Ring, <i>Tallinn University of Technology, Estonia</i>
Indexation of Carbonate Stones Sustainable Assessment Julija Šommet, <i>Tallinn University of Technology, Estonia</i>
Oil Shale Ash as a Binder for Backfilling Materials Aleksander Pototski, <i>Tallinn University of Technology, Estonia</i>
18:00-19:00 - Dinner
19:00-22:00 – Visit to waterpark in Tevise Paradiis (Side str. 14, Pärnu)

JANUARY 18, 2013

9:00-10:00 - Invited Speeches

VSC HVDC – APPLICATIONS AND TECHNOLOGY

Dr. Staffan Norrnga, *KTH Royal Institute of Technology, Sweden*

STORAGE DEVICES FOR ELECTRICAL ENERGY

Prof. Istvan Vajda, *Budapest University of Technology and Economics, Hungary*

10:00-11:00 – Special Session

PhD THESES PRE-DEFENCE PRESENTATIONS

Chairman: Prof. Valery Vodovozov, Co-Chairman: Prof. Ivars Rankis

New Converter Topologies for Integration of Hydrogen Based Long-Term Energy Storages to Renewable Energy Systems

Anna Andrijanovits, *Tallinn University of Technology, Estonia*

Research and Development of Control Means for Intelligent Distribution Grids with Dimmable LED Lamps

Alexander Suzdalenko, *Tallinn University of Technology, Estonia / Riga Technical University, Latvia*

Research and Development of the New Topologies for the Isolation Stage of Power Electronic Transformer

Viktor Beldjajev, *Tallinn University of Technology, Estonia*

11:00-12:00 – Regular Session

POWER ELECTRONICS

Chairman: Dr. Oleksandr Husev, Co-Chairman: M. Sc. Anton Rassõlkin

A State-of-the-Art Review of the Z-Source and Quasi-Z-Source DC/DC Converter Topologies

Andrii Chub, *Tallinn University of Technology, Estonia*

Asymmetrical Higher Harmonics Compensation in Grid Connected AC-DC Converter Control

Grzegorz Wrona, *Warsaw University of Technology, Poland*

Necessity of Active Condition Monitoring in Power Electronic Converters

Tommi Kärkkäinen, *Lappeenranta University of Technology, Finland*

A Prototype of Adjustable Current Driver for Dimmable LED Lamp

Olegs Tetervenoks, *Riga Technical University, Latvia*

Current Control Strategy of a Grid Connected Three-Level Neutral-Point-Clamped qZS Inverter

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

Analysis and Design of Modular Multilevel Converters for Grid Connected Applications

Kalle Ilves, *KTH Royal Institute of Technology, Sweden*

12:00-13:00 – Regular Session

ELECTRICAL DRIVES AND ELECTRICAL MACHINES - I

Chairman: Prof. Valery Vodovozov, Co-Chairman: M. Sc. Andrii Chub

Implementation and Testing the Sensorless Pressure Measurement of Centrifugal Pumps

Ilja Bakman, *Tallinn University of Technology, Estonia*

Demagnetization on Permanent Magnet Machine with Halbach Array

Ants Kallaste, *Tallinn University of Technology, Estonia*

Predictive Current Method for Single Open-phase Fault Detection in Permanent Magnet Synchronous Machine

Andraž Kontarček, *University of Ljubljana, Slovenia*

Cogging Torque Reduction Methods

Oleg Kudrjavitsev, *Tallinn University of Technology, Estonia*

An Overview of Electrical Vehicle and Hybrid Electrical Vehicle Drives

Anton Rassõlkin, *Tallinn University of Technology, Estonia*

Effect of Manufacturing on Stator Core Losses

Deepak Singh, *Aalto University, Finland*

13:00-14:00 - Lunch

14:00-15:00 – Regular Session

SMART GRIDS AND RENEWABLE ENERGY SYSTEMS - I

Chairman: Dr. Janis Zakis, Co-Chairman: M. Sc. Irena Milashevski

Wind & Photovoltaic Hybrid Energy System Design on the Basis of Standard Workload Graphs of Estonian Small Consumers

Alo Allik, *Tallinn University of Technology, Estonia*

Weather Data Analysis for Prediction of Renewable Energy Sources Production

Vasco Delgado-Gomes, *New University of Lisbon, Portugal*

Electric Vehicles and Their Impact on the Estonian Power System Load Curve

Imre Drovtar, *Tallinn University of Technology, Estonia*

Network Quality Indicators and Overview of Longterm Load Forecasting Models

Tiit Hõbejägi, *Tallinn University of Technology, Estonia*

Microgrid Control and Electricity Auction

Tarmo Korõtko, *Tallinn University of Technology, Estonia*

Comparison Between Equivalent Circuit Diagrams and Fractional Rational Functions in the Frequency Domain for Lithium-Ion Battery Modeling

Ahmad Rahmoun, *Kempen University of Applied Sciences, Germany*

<p>15:00-16:00 – Regular Session ELECTRICAL DRIVES AND ELECTRICAL MACHINES - II Chairman: Dr. Andrei Blinov, Co-Chairman: M. Sc. Imre Drovtar</p>
<p>Modeling and Analysis of the Synchronous Generatr's Excitation Systems Vadim Slenduhhov, <i>Tallinn University of Technology, Estonia</i></p>
<p>C Programming Language Based Finite Element Analysis of Permanent Magnet Synchronous Motors Gergely Kovács, <i>Széchenyi István University, Hungary</i></p>
<p>Forming of Six-Phase Double Layer Induction Motor Windings Benas Kundrotas, <i>Vilnius Gediminas Technical University, Lithuania</i></p>
<p>Stator Voltage Analysis of Frequency Converter Fed Induction Generator with Broken Rotor Bars Toomas Vaimann, <i>Tallinn University of Technology, Estonia</i></p>
<p>Domain Decomposition Algorithms for Parallel Solution of Magnetic Field Problems Dániel Marcsa, <i>Széchenyi István University, Hungary</i></p>
<p>Electromagnetic Design of Hybrid Synchronous Motor Elena Suvorkova, <i>Budapest University of Technology and Economics, Hungary</i></p>
<p>16:00-16:15 - Coffee</p>
<p>16:15-18:00 – Regular Session ELECTRICAL ENGINEERING Chairman: Dr. Indrek Roasto, Co-Chairman: M.Sc. Toomas Vaimann</p>
<p>Optimization of the Sub-Station Control System and Operative Switching Glebs Golubovs, <i>Riga Technical University, Latvia</i></p>
<p>Equalization Control During Charging/Driving for Series Connected Batteries Javier Gallardo-Lozano, <i>University of Extremadura, Spain</i></p>
<p>Energy Flow Control System with Robot-Accumulator Interfacing Module Kristaps Vitols, <i>Riga Technical University, Latvia</i></p>
<p>Overview of Simplified Mathematical Models of Batteries Sergei Melentjev, <i>Tallinn University of Technology, Estonia</i></p>
<p>Implementation of Industrial Robots in Instruction at Tallinn University of Technology Margus Müür, <i>Tallinn University of Technology, Estonia</i></p>
<p>Analysis of the Traction System Impact on Voltage Unbalance Distribution in Public Electric Networks Tanel Sarnet, <i>Tallinn University of Technology, Estonia</i></p>
<p>Common Node Circular Current Examination in Shared DC Bus Power System Armands Senfelds, <i>Riga Technical University, Latvia</i></p>

<p>The Concept of Simulation of Two Electrical Vehicles with Energy Storage Systems Connected to Common Contact Network Genadijs Zaleskis, <i>Riga Technical University, Latvia</i></p>
<p>Semiconductor Converters for Serial Connection of Distributed Energy Sources Ievgen Maliarenko, <i>National Technical University "Kharkov Polytechnic Institute", Ukraine</i></p>
<p>Finite Element Modelling of Additional Losses Due to Galvanic Contacts on the Edges of Lamination Stacks Sahas Bikram Shah, <i>Aalto University, Finland</i></p>
<p>18:00-19:30 – Regular Session SMART GRIDS AND RENEWABLE ENERGY SYSTEMS – II Chairman: Prof Ilya Galkin, Co-Chairman: M. Sc. Kristaps Vitols</p>
<p>Constant Current Models of Permanent Magnet Brushless Direct Current Motor Prof. Krzysztof Krykowski, <i>Silesian University of Technology, Poland</i></p>
<p>Analysis of Peak Shaving of Utility Networks Loads with Electric Vehicles Connected to Distribution Substations Marek Mägi, <i>Tallinn University of Technology, Estonia</i></p>
<p>Facing Distorted Current and Undesirable Consumption in Smart Grids Jaan Niitsoo, <i>Tallinn University of Technology, Estonia</i></p>
<p>Algorithm for Management of Energy in the DC Bus of Microgrid Kristjan Peterson, <i>Tallinn University of Technology, Estonia</i></p>
<p>Prospects of Photovoltaic Systems in Finland Mikko Purhonen, <i>Lappeenranta University of Technology, Finland</i></p>
<p>Multidisciplinary Design Optimization Approach for Switched Reluctance Machine Flywheel Design for Solar Power Applications Arpad Racz, <i>Budapest University of Technology and Economics, Hungary</i></p>
<p>Overview of the Photovoltaic System Topologies Pavels Suskis, <i>Riga Technical University, Latvia</i></p>
<p>Overview of Single Phase Matrix Converter Application Maxim Vorobyov, <i>Riga Technical University, Latvia</i></p>
<p>20:00-23:00 – Gala Dinner and Awards Ceremony</p>