

CONFERENCE PROGRAM

JANUARY 12, 2015
12:30-13:30 – Lunch
13:00-14:00 - Registration
14:00-14:20 - Opening Ceremony
Tõnu Lehtla, <i>Chairman of the Council of Doctoral School of Energy and Geotechnology, Tallinn University of Technology</i> Dmitri Vinnikov, <i>General Chairman of the Conference</i>
14:20-16:00 – Special Session “DOCTORAL SCHOOL OF ENERGY AND GEOTECHNOLOGY-II (DSEG-II): PAST, PRESENT AND FUTURE” - Part I: Past and Present Chairman: Dmitri Vinnikov, Co-Chairman: Tõnu Lehtla
Overview of Main Activities and Results of the DSEG-II in 2009-2015 Dmitri Vinnikov, <i>DSEG-II Project Coordinator, TUT</i>
DSEG-II: Feedback from the Faculty of Mechanical Engineering Tauno Otto, <i>Dean of the Faculty of Mechanical Engineering, TUT</i>
DSEG-II: Feedback from the Faculty of Power Engineering Arvi Hamburg, <i>Dean of the Faculty of Power Engineering, TUT</i>
DSEG-II: Feedback from Alumni Indrek Roasto, <i>Senior Researcher, Department of Electrical Engineering, TUT</i> Veiko Karu, <i>Teaching Assistant, Department of Mining, TUT</i> Viktor Beldjajev, <i>Senior Engineer, ABB Drives & Renewables Factory</i> Lauri Kütt, <i>Post-Doc Researcher, Aalto University, Finland</i>
16:00-16:20 - Coffee
16:20-18.00 – Special Session “DOCTORAL SCHOOL OF ENERGY AND GEOTECHNOLOGY-II (DSEG-II): PAST, PRESENT AND FUTURE” - Part II: Future Chairman: Erkki Truve, Co-Chairman: Arvi Hamburg
DSEG-III: Possibilities and Challenges Erkki Truve, <i>Vice Rector for Research, TUT</i>
Importance of DSEG-III for the Estonian Business Sector Hannes Agabus, <i>Alumni of DSEG-I, CEO of Ubik Solutions LLC, Estonia</i>

Development of Enterprises at Pärnu County

Sulev Alajõe, *Head of The Business and Development Centre of Pärnu County, Estonia*

Internationalization of DSEG-III: Remarks from the Foreign Partners

Lauris Bisenieks, *Head of Doctoral Studies Department at Riga Technical University, Latvia*
 Pia Lindh, *Coordinator of Doctoral Programme of Electrical Engineering (DPEEE), Finland*
 Mariusz Malinowski, *Warsaw University of Technology, Poland*

18:00-19:00 – Panel Discussion

DOCTORAL SCHOOL OF ENERGY AND GEOTECHNOLOGY – III: General Idea, Partners, Scope, Aims and Challenges

Moderators: Anton Rassõlkin, Argo Rosin, *TUT*

20:00-23:00 – Welcome Reception**JANUARY 13, 2015****9:00-12:00 - Tutorials****POWER ELECTRONICS**

Chairman: Prof. Istvan Vajda, Co-Chairman: Dr. Lauri Kütt

Single and Three-Phase Grid-Side Converters

Prof. Mariusz Malinowski, *Warsaw University of Technology, Poland*

Reliability in Power Electronics

Prof. Frede Blaabjerg, *Aalborg University, Denmark*

Electromagnetic Compatibility of Power Electronic Interfaces and Power Line Communication

Dr. Robert Smolenski, *University of Zielona Gora, Poland*

Power Electronics for Renewable Energy Systems

Prof. Frede Blaabjerg, *Aalborg University, Denmark*

A Multilevel Power Converter Topology Based on Dual Voltage Source Inverter

Dr. Vitor Pires, *Instituto Politécnico Setúbal, Portugal*

Grid-Connected Photovoltaic Power Injection Systems: A Cooperative Approach

Dr. Víctor Minambres Marcos, *University of Extremadura, Spain*

Application and Investigation of Pulse Modulated Transformer

Prof. Ivars Rankis, *Riga Technical University, Latvia*

12:00-13:00 - Tutorials**SMART GRIDS**

Chairman: Prof. Mariusz Malinowski, Co-Chairman: Prof. Marius Klytta

Comparison of Price Sensitive Models for Load Control

Dr. Argo Rosin, *Tallinn University of Technology, Estonia*

Ecogrid EU Project Overview Dr. Ivo Palu, <i>Tallinn University of Technology, Estonia</i>
The Future Power System Prof. Grzegorz Benysek, <i>University of Zielona Gora, Poland</i>
13:00-14:00 – Lunch
14:00-15:45 – Tutorials <i>ELECTRICAL DRIVES AND ELECTRICAL MACHINES</i> Chairman: Prof. Ilya Galkin, Co-Chairman: Prof. Tõnu Lehtla
Power Accounting for Ship Electric Propulsion Prof. Valery Vodovozov, <i>Tallinn University of Technology, Estonia</i>
Manufacturing Issues of PM Machines Dr. Pia Lindh, <i>Lappeenranta University of Technology, Finland</i>
Faults, Diagnosis and Maintenance of Electrical Machines Dr. Toomas Vaimann, <i>Tallinn University of Technology, Estonia</i>
Mechanical-Level Hardware-in-the-Loop Simulation HIL as Dynamic System Dr. Tuomo Lindh, <i>Lappeenranta University of Technology, Finland</i>
15:45-16.00 – Coffee
16.00-18:00 – Tutorials <i>ELECTRICAL ENGINEERING</i> Chairman: Prof. Jaan Järvi, Co-Chairman: Dr. Alexander Suzdalenko
Superconductors for Power Applications Prof. Pedro Pereira, <i>Universidade Nova de Lisboa (FCT-UNL), Portugal</i>
Thermoelectric Materials and Applications Dr. Lauri Kütt, <i>Aalto University, Finland</i>
Modelling Coolant Flow in Lumped Parameter Thermal Network Prof. Tapani Jokinen, <i>Aalto University, Finland</i>
Sensor Data Remote Acquisition Dr. Peteris Apse-Apsitis, <i>Riga Technical University, Latvia</i>
18:00-19:00 - Dinner
20:00-23:00 – Social Session

JANUARY 14, 2015

09:00-10:45 – Tutorials

MECHATRONICS AND MECHANICAL ENGINEERING - I

Chairman: Prof. Mart Tamre, Co-Chairman: Prof. Petri Kuosmanen

Digital Control Modeling for Transportation Problem Optimization

Prof. Victor Musalimov, Dmitry Ruban, Assoc.Prof. Olga Ruban, *Saint Petersburg National Research University of Informational Technology, Mechanics and Optics, Russia/ Tallinn University of Technology, Estonia*

Modeling and Control Strategy for Hybrid Electrical Vehicle

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

Influence of Geomaterials on Increase of Wear Resistance of Friction Pairs

Prof. Margarita Skotnikova, N. A. Krylov, E.K. Ivanov, G.V. Tsvetkova, V.V. Medvedeva, *St. Petersburg State Polytechnical University, Russia*

Introduction to Mechatronics Professional Qualification Standards in Estonia

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

10:45-11:00 – Break

11:00-13:00 – PhD Thesis Defence

Tanel Aruväli, *Department of Machinery, Tallinn University of Technology*

Wireless Real-Time Monitoring of Machining Processes

Supervisor: Prof. Tauno Otto, *Tallinn University of Technology, Estonia*

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

Prof. Algirdas Bargelis, *Kaunas University of Technology, Lithuania*

13:00-14:00 – Lunch

14:00-15:45 – Regular Session

MECHANICS AND MECHATRONICS - I

Chairman: Prof. Tauno Otto, Co-Chairman: Prof. Victor Musalimov

CAD and CAE in Mechanical Engineering Education at Aalto University

Kaur Jaakma, *Aalto University, Finland*

Value Centric Business Developing Methodology for Estonian Manufacturing SMEs,

Introduction to PhD thesis

Merili Kukuškin, *Tallinn University of Technology, Estonia*

Assessment of Operating Leverage in the Mechanical Engineering Industry

Zahra Mogharrari, *National Research University of Informational Technology, Mechanics and Optics (NRU ITMO), Russia*

Productivity Improvement by Implementing Lean Production Approach

Kashif Mahmood, *Tallinn University of Technology, Estonia*

<p>Going Open Source in Developing Production Monitoring System Aleksei Snatkin, Tanel Eiskop, <i>Tallinn University of Technology, Estonia</i></p>
<p>Development of Registering Instrument for Shock Systems Nikita Dudenkov, <i>National Research University of Informational Technology, Mechanics and Optics (NRU ITMO), Russia</i></p>
<p>Robotics in Arts: Mobile Robot for Long-Exposure Photography Dmitry Kupriyanov, <i>National Research University of Informational Technology, Mechanics and Optics (NRU ITMO), Russia</i></p>
<p>15:45-16:15 - Coffee</p>
<p>16:15-18:00 – Regular Session MECHANICS AND MECHATRONICS – II Chairman: Prof. Trieu Minh Vu, Co-Chairman Prof. Algirdas Bargelis</p>
<p>Applicability of Memristors for Research of Friction Processes Kirill Nuzhdin, <i>National Research University of Informational Technology, Mechanics and Optics (NRU ITMO), Russia</i></p>
<p>Optimization of the Alignment Position for SPAD-Detector Calibration Klodian Dhoska, <i>Tallinn University of Technology, Estonia</i></p>
<p>Development of Design, Control System and Feedback System of Electromechanical Hand Ivan Borisov, <i>National Research University of Informational Technology, Mechanics and Optics (NRU ITMO), Russia</i></p>
<p>The Usage of Vicon Data for Motion Modeling via OpenSim Irina Rubinstein, <i>National Research University of Informational Technology, Mechanics and Optics (NRU ITMO), Russia</i></p>
<p>Modeling of the Working Surfaces Geometry of the Knee Joint Elements Nadezhda Krokhalova, <i>National Research University of Informational Technology, Mechanics and Optics (NRU ITMO), Russia</i></p>
<p>Various Ways for Controlling Different Types of Devices Using EMG Technology Dmitri Rõbak, <i>Tallinn University of Technology, Estonia</i></p>
<p>Development of Methodology for Research of the Viscoelastic Properties of Biological Skin Islam. A. Bzhikhatlov, <i>National Research University of Informational Technology, Mechanics and Optics (NRU ITMO), Russia</i></p>
<p>18:00-19:00 - Dinner</p>
<p>20:00-23:00 – Social Session</p>

JANUARY 15, 2015

9:00-10.30 – Special Session

EDUCATIONAL ASPECTS

Chairman: Prof. Istvan Vajda, Co-Chairman: Dr. Zoja Raud

Conventions, Complexity and Specificity in Engineering Research Writing

Mare-Anne Laane, *Tallinn University of Technology, Estonia*

Self-Assessment in Learning Electrical Engineering Disciplines

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

Presentation Skills: How to Prepare and Deliver a Presentation

Dr. Anton Rassõlkin, *Tallinn University of Technology, Estonia*

PhD Studies and Routines for the Defence of the Dissertation in National Technical University of Ukraine “Kyiv Polytechnic Institute”

Dr. Anna Kyselova, *National Technical University of Ukraine “Kyiv Polytechnic Institute”, Ukraine*

10:30-11:30 – Special Session

PhD THESES PRESENTATIONS

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

Efficiency Optimization Through Semiconductor Loss Reduction in qZS-Based Galvanically Isolated DC-DC Converters

Liisa Liivik, *Tallinn University of Technology, Estonia*

Development of Design Methodology for Microgrid Substations Based on 150 kW Prototype

Kristjan Peterson, *Tallinn University of Technology, Estonia*

11:30-13:00 Regular Session

SMART GRIDS AND DEMAND SIDE MANAGEMENT

Chairman: Dr. Argo Rosin, Co-Chairman: M. Sc. Imre Drovтар

Demand Side Management Potential in Estonia

Imre Drovтар, *Tallinn University of Technology, Estonia*

The Impact of The Reactive Power Sharing Methods on Transmission Power Losses in Islanded AC Microgrid

Adam Milczarek, *Warsaw University of Technology, Poland*

Resources Save and Energy Effective Control of Diesel Generators and Renewable Sources

Ievgen Pichkalov, *National Technical University of Ukraine “Kyiv Polytechnic Institute”, Ukraine*

European Climate and Energy Policy and the Estonian Energy Sector up to 2030

Jaanus Uiga, *Estonian University of Life Sciences, Estonia*

Primary Saving Opportunity in Street Lighting

Marko Kuusik, *Tallinn University of Technology, Estonia*

Assessment Energy of Wind Waves in the Arabian Sea by Satellite Altimetry

Hossein Farjami, *Russian State Hydrometeorology University, Russia*

The Features of Using Electrochemical Energy Storage Elements

Bohdan Styslo, *National Technical University “Kharkov Polytechnic Institute”, Ukraine*

13:00-14:00 – Lunch
14:00-15:30 – Special Session SUSTAINABLE MINING ENGINEERING Chairman: Dr. Jüri-Rivaldo Pastarus, Co-Chairman: Dr. Murat Mustafin
Influence of Speed Mineral Extraction on the Nature of Displacement Underworked Rock Mass Dr. Murat Mustafin, <i>National University of the Mineral Resources "University of Mines", Russia</i>
Legal and Safety Aspects of Explosives Handling Tõnu Tomberg, Gaia Grossfeldt, <i>Tallinn University of Technology, Estonia</i>
Properties of Run of Mine Fred Rusanov, <i>Tallinn University of Technology, Estonia</i>
Analyses of Mining Losses Martin Saarnak, <i>Tallinn University of Technology, Estonia</i>
15:30-16:00 – Coffee
16:00-18:00 – Regular Session MINING TECHNOLOGIES Chairman: PhD. Veiko Karu, Co-Chairman: Julia Gulevich
Possible Usage of Crushing Buckets in Oil Shale Mining Tiit Rahe, <i>Tallinn University of Technology, Estonia</i>
Mine Survey and Surface Mining Engineering Kaupo Kuusemäe, <i>Tallinn University of Technology, Estonia</i>
Water Quality in Maardu Phosphate Rock Mining Area in Estonia Margit Kolats, <i>Tallinn University of Technology, Estonia</i>
Mining Conditions for the Cement Industry Riho Iskül, <i>Tallinn University of Technology, Estonia</i>
Lake mud Exploitation Merle Otsmaa, <i>Tallinn University of Technology, Estonia</i>
Rock Properties for Road Construction Julia Gulevich, <i>Tallinn University of Technology, Estonia</i>
Methods for Digitizing Mine Plans and Data of Mined Out Areas Vivika Väizene, <i>Tallinn University of Technology, Estonia</i>
Measuring of Rock Properties with Laser-induced Spectroscopy Veiko Karu, <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 16, 2015

9:00-10:00 - INVITED SPEECHES

Smart Storage: Needs and Strategies

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

Electrical Energy Storage Challenges

Prof. Istvan Vajda, *Obuda University, Hungary*

10:00-11:00 – Special Session

ELECTRICAL ENGINEERING

Chairman: Prof. Jaan Järvi, Co-Chairman: Dr. Anna Kyselova

Matrix Converters with Extended Control Range of the Input of the Reactive Current for Active Compensation of the Power Components

Dr. Vasyl Chopyk, *Institute of Electrodynamics of the National Academy of Sciences of Ukraine*

Control Signals of Three Phase Matrix Frequency Converters Obtained in Domain with Two Independent Variables

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

Are Physicists Gave Up Too Early Thinking on the Nature of Electricity?

Prof. Jaan Järvi, *Tallinn University of Technology, Estonia*

11:00-13:00 – Regular Session

POWER ELECTRONICS

Chairman: Dr. Tanel Jalakas, Co-Chairman: M. Sc. Andrii Chub

New Trends in Galvanically Isolated Impedance Source DC-DC Energy Conversion

Andrii Chub, *Tallinn University of Technology, Estonia*

Power and DC-Link Voltage Controls of the Grid-Tie Single-Phase Impedance Source NPC Inverter

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

Comparison of Current Control Strategies for Three-Level Four-Leg Shunt Active Power Filter

Kamil Antoniewicz, *Warsaw University of Technology, Poland*

Investigation of Transformer Based AC Pulse Modulation System

Marcis Prieditis, *Riga Technical University, Latvia*

Shunt Active Power Filter with Fuzzy Logic Interface for Harmonic Reduction

Piotr Majtczak, *Warsaw University of Technology, Poland*

Particle Swarm Optimization-Based Global Maximum Power Point Searching for PV Power Plant

Radoslaw Kot, *Warsaw University of Technology, Poland*

State of the Art Review of PV Module-Level Power Electronics

Roman Kosenko, *Tallinn University of Technology, Estonia*

Power Supply System Based on Photovoltaic Panels and Three-level NPC Inverter

Tatiana Shults, *Tallinn University of Technology, Estonia*

13:00-14:00 - Lunch

14:00-15:45 – Regular Session

ELECTRICAL DRIVES AND ELECTRICAL MACHINES

Chairman: Prof. Tapani Jokinen, Co-Chairman: Dr. Toomas Vaimann

Pressure Regulation in Centrifugal Pumping System with PLC

Levon Gevorkov, *Tallinn University of Technology, Estonia*

A Symmetrical 6-phase Induction Machine Audible Noise Experimental Investigation

Michal Rolak, *Warsaw University of Technology, Poland*

Vibration as Fault Indicator in Electrical Machines

Mehrnaz Farzam Far, *Aalto University, Finland*

Active Magnetic Bearing Calibration to Compute Levitation Force in a Bearingless Synchronous Reluctance Motor Drive

Victor Mukherjee, *Aalto University, Finland*

Creation of Surface Dynamometer Cards of Sucker Rod Pump Using Frequency Converter Estimates and Process Identification Run

Jan-Henri Montonen, *Lappeenranta University of Technology, Finland*

Modeling and Control of PWM Fed 6-Phase Permanent Magnet Synchronous Machine

Michal Rolak, *Warsaw University of Technology, Poland*

Simple Numerical Optimization of a Switched Reluctance Motor

Kristóf Várszegi, *Budapest University of Technology and Economics, Hungary*

15:45-16:00 – Coffee

16:00-18:30 – Regular Session

ELECTRICAL ENGINEERING

Chairman: Prof. Vitor Pires, Co-Chairman: Dr. Oleksandr Husev

Power Quality Improvement by Joined Operation of an UPQC and Superconducting Magnetic Energy Storage unit

Nuno Amaro, *Nova University of Lisbon, Portugal*

Case Study of ECD Model Accuracy in Estimating the Cell Output Voltage and Power Dissipation

Ahmad Rahmoun, *Tallinn University of Technology, Estonia*

An Insight into the Evolution of Direct Current Systems

Girts Stana, *Riga Technical University, Latvia*

Recent Development in High Power Impulse Magnetron Sputtering Technology-Selected Topologies

Ludwik Zajac, *Warsaw University of Technology, Poland*

Magnetically Controlled Shunt Reactors Overview

Romualds Bogdanovičs, *Riga Technical University, Latvia*

Road Lighting Measurement and Evaluation of New Technologies

Toivo Varjas, *Tallinn University of Technology, Estonia*

Modelling of HVAC Cable Network for System Studies

Triin Kangro, *Tallinn University of Technology, Estonia*

Adjusting the Number of Working Pumps Through Efficiency Control

Ilja Bakman, *Tallinn University of Technology, Estonia*

Benefits of Wall Heating System Against Floor Heating System

Barbara Rakoczi, *Obuda University, Hungary*

Voltage Control and Stabilization of Electrical Voltage in High Voltage Power Grid by Controlled Inductance-Capacitance Parameters Equipment

Maria Makarova, *Moscow State University, Russia*

20:00-24:00 – Gala Dinner and Awards Ceremony

INSTRUCTION FOR PRESENTERS OF PAPERS (REGULAR SESSIONS)

All papers have been scheduled in oral sessions to allow a dynamic exchange among the researchers and a better understanding of the new concepts and ideas presented at the Conference.

Authors are kindly requested to meet their session chairman in the session room 15 minutes before the scheduled time in order to download their presentation to the computer. They have to provide the session chairman with a PowerPoint or PDF presentation. Authors must assure that all fonts needed are embedded in their presentation files.

The files can be downloaded to the computer from a USB key or a CD-ROM. The use of the author's computer will not be allowed, in order for sessions to run smoothly.

The length of the presentation is restricted to 15 minutes, including questions. The authors are strongly advised to keep their oral presentation within 10-12 minutes (up to 10 slides) and to leave 3 minutes for discussion with the audience.

BEST PRESENTATION AND MOST ACTIVE PARTICIPANT AWARDS

Awards and certificates will be given for the best presenter of every regular session, which will be recommended by the session chairmen and finally selected by the Programme Committee of the Conference. To be eligible for the award candidates are required to be both presenters and first authors of the contribution.

To emphasize and encourage active participation during the Conference a special award will be given to the most active participant. Selection criteria will be quality and number of questions directed to the presenters of the tutorials and regular sessions. Candidates will be recommended by the session chairmen and the winner will be finally selected by the Program Committee of the Conference.

Awards ceremony will be organized during the Gala Dinner on Friday, January 16, 2015 from 20:30 to 21:30.