2019 IEEE 20th International Conference
Computational
Problems of
Electrical
Engineering

September 15-18, Slavske-Lviv, Ukraine

PROGRAM

ORGANIZERS

LVIV POLYTECHNIC NATIONAL UNIVERSITY
Department of Theoretical and Electrical Engineering

WARSAW UNIVERSITY OF TECHNOLOGY
Institute of the Theory of Electrical Engineering, Measurement and Information Systems

LODZ UNIVERSITY OF TECHNOLOGY
Institute of Computer Sciences

UNIVERSITY OF WEST BOHEMIA
Department of Theory of Electrical Engineering

UNIVERSITY OF ZILINA
Faculty of Electrical Engineering

IEEE Ukraine Section

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Final Program

Date	Time	Event
15.09.2019 **Sunday**		**Lviv**
	10.00-12.00	Arrival of Participants to Lviv Polytechnic
	12.00	Transfer to Slavske
		Slavske (Polytechnic Campus)
	14.00-15.00	Lunch
	15.00-18.00	Registration
	19.00	Welcome Party
16.09.2019 **Monday**	9.00-10.00	Breakfast
	10.00-10.30	Opening Ceremony
	10.30-11.45	Plenary Session
	11.45-12.00	Coffee Break
	12.00-13.00	Oral Session 1 (OS1) – S5
	13.00-14.00	Lunch
	14.00-16.00	Oral Session 2 (OS2) – S3
	16.00-16.30	Coffee Break
	16.30-18.30	Poster Session 1 (PS1) – S1, S2, S3
	19.00	Dinner
17.09.2019 **Tuesday**	9.00-10.00	Breakfast
	10.00-11.20	Oral Session 3 (OS3) – S5
	11.20-11.40	Coffee Break
	11.40-13.00	Oral Session 4 (OS4) – S1, S4
	13.00-14.00	Lunch
	14.00-16.00	Oral Session 5 (OS5) – S2, S3, S4
	16.00-16.30	Coffee Break
	16.30-18.30	Poster Session 2 (PS2) – S2, S3, S5, S6
	19.00	Dinner
18.09.2019 **Wednesday**	9.00-10.00	Breakfast
	10.00	Transfer to Lviv
		Lviv
	11.00-11.30	Closing Ceremony (Lviv Polytechnic)
	11.30-12.30	Buffet Lunch
	13.00-16.00	Excursion

Section 1 (S1). Electromagnetic and Coupled Fields
Section 2 (S2). Circuit and System Theory and its Application, Modeling and Algorithmization
Section 3 (S3). Power Engineering Theory, Electrical Machine and Apparatus
Section 4 (S4). Measurements in Electrical Engineering
Section 5 (S5). Signal Processing and Identification Aspects, Biomedicine
Section 6 (S6). Didactics in Electrical Engineering

September 16, 2019 Monday

Opening Ceremony   10.00-10.30

Plenary Session   10.30-11.45

Chairs: **Prof. Kazimierz MIKOŁAJUK and Oksana HOHOLYUK**

1. <u>Yurii BOBALO</u>, <u>Nataliya SHAKHOVSKA</u> and <u>Petro STAKHIV</u>.
   The Gamification Approach in Electrical Engineering Disciplines Teaching for Students with Special Needs

2. <u>Tadeusz KACZOREK</u>.
   Decomposition of the Controllability and Observability Matrices into Symmetrical and Asymmetrical Parts in Linear Electrical Circuits

3. <u>Jan BARABAS</u>, Roman RADIL and Ladislav JANOUSEK.
   Metallic incubators in bio-EMF experiments - possible source of discrepancies between research groups and results?

September 16, 2019 Monday

Oral Session 1 (OS1)   12.00-13.00

Section 5. Signal Processing and Identification Aspects, Biomedicine

Chairs: **Prof. Tadeusz KACZOREK and Vaclav KOTLAN**

1. <u>Tadeáš BEDNÁR</u>, Dominika ORENIČOVÁ, Štefan BORIK and Branko BABUŠIAK.
   A simple wireless ECG system for education practice

2. <u>Stanislaw OSOWSKI</u> and Tomasz LES.
   Deep Learning in Melanoma Recognition

3. Roman VOLIANSKY, Oleksandr SADOVOI, Nina VOLIANSKA and Vitaliy KUZNETSOV.
   Interval Modeling and Simulation of Active Knee Prosthesis

September 16, 2019 Monday

Oral Session 2 (OS2)   14.00-16.00

Section 3. Power Engineering Theory, Electrical Machine and Apparatus

Chairs: **Prof. Ivo DOLEZEL and Ivanna VASYLCHYSHYN**

1. Sergii SAUKH and Andriy BORYSENKO.
   Representation of Transmission and Distribution Networks in the Mathematical Model of the Electricity Market Equilibrium

2. Orest LOZYNSKYI, Yaroslav PARANCHUK, Volodymyr MOROZ and Petro STAKHIV.
   Computer Model of the Electromechanical System of Moving Electrodes of an Arc Furnace with a Combined Control Law

3. Łukasz TOPOLSKI and Zbigniew HANZELKA.
   Mitigation of Current and Voltage Unbalance Caused by Single-Phase Loads and Renewable Energy Sources in Low-Voltage Electricity Networks

4. Yuriy VARETSKY and Volodymyr KONOVAL.
   Modeling FACTS Device Impact on Voltage Flicker in the Electric Arc Furnace Supply System

5. Oleksandr SINYAVSKY, Vitaliy SAVCHENKO and Alla DUDNYK.
   Development and Analysis Methods of Transporter Electric Drive for Electrotechnological Complex of Crop Seed Presowing by Electromagnetic Field

6. Ihor SHCHUR and Yurii BILETSKYI.
   Passivity-Based Control of Hybrid Energy Storage System with Common Battery and Modular Multilever DC-DC Converter-Based Supercapacitor Packs

September 16, 2019 Monday

Poster Session 1 (PS1)   16.30-18.30

Section 1. Electromagnetic and Coupled Fields
Section 2. Circuit and System Theory and its Application, Modeling and Algorithmization
Section 3. Power Engineering Theory, Electrical Machine and Apparatus

Chairs: **Prof. Mykola DYVAK and Andriy PUKAS**

1. Borys KUZNETSOV, Ihor BOVDUI and Tatyana NIKITINA.
   Magnetic Field Active Shielding Robust System Synthesis as Multi Criteria Game Decision Based on Particles Multi Swarm Optimization

2. Rao FU, Ilya GRINBERG and Petro GOGOLYUK.
   Electric Power Distribution System Fault Recovery Based on Visual Computation

3. Yuriy VASETSKY and Iryna MAZURENKO.
   Stray Magnetic Fields of Toroidal Superconducting Magnetic Energy Storage

4. Kazimierz MIKOŁAJUK and Andrzej TOBOŁA.
   Piecewise Signals for the Iterative Control of the Voltage Conditioner

5. Yevhen FEDIV, Olha SIVAKOVA and Mykhailo KORCHAK.
   Model of Virtual Source of Reactive Power for Smart Electrical Supply Systems

6. Andriy BONDARIEV, Ivan MAKSYMIV and Serhii ALTUNIN.
   Simulation and Experimental Research of Software Implemented Phase-Locked Loop with Improved Noise Immunity

7. Volodymyr-Myron MISKIV, Ivan PRUDYUS and Roman YANKEVYCH.
Matrix Approach to Binary Code Sequences Optimization for Noise Immune Communication Systems

8. Serhii KOSTIUCHKO and Vasyl TCHABAN.
Variational Method of Auxiliary Equations in Nonlinear Systems Analysis and Synthesis Problems

9. Vasyl MALYAR, Orest HAMOLA, Volodymyr MADAY and Ivanna VASYLCHYSHYN.
Mathematical Simulation of Processes in an Asynchronous Motor Powered by a Cable Line

10. Victor HOBLYK, Volodymyr PAVLYSH and Nadiia HOBLYK.
Development of the Antennas Theory and Technique Based on Modelled Impedance Structures in Lviv Polytechnic National University

11. Iryna BELYAKOVA, Volodymyr MEDVID, Vadim PISCIO, Oleh SHKODZINSKY, Roman MYKHAILYSHYN and Mariya MARKOVYCH.
Usage of Light-Emitting-Diode Lamps in Decorative Lighting

12. Iuliia YAMNENKO and Vitaliy LEVCHENKO.
Video-Data Compression Using Wavelet Analysis

13. Oleksandr DERETS, Oleksandr SADOVOI and Yevgeniya DERETS.
Synthesis Algorithm of Proximate Time-Optimal Servo Drive with Constraint of State Coordinates

14. Ivan KARBOVNYK, Ihor BERIZKA, Ivanna VASYLCHYSHYN, Halyna KLYM, Roman DUNETS and Ivan HORBATYI.
Cost Efficient CCD-based Spectrometer with Microprocessor/PC Control

15. Zuzana PSENAKOVA, Mariana BENOVA and Jana MYDLOVA.
Investigation of SAR (Specific Absorption Rate) in Different Head Models Placed in Shielded Space

16. Dmitro TRUSHAKOV, Oleksandr KOZLOVSKYI and Serhiy RENDZINYAK.
Basic Technical Principles Construction of Local Computer Systems for Managing of Technological Objects

17. Petro LEZHNIUK, Vyacheslav KOMAR and Serhii KRAVCHUK.
Regimes Balancing in the Local Electric System with Renewable Sources of Electricity

18. Mykhailo SEHEDA and Petro GOGOLYUK.
Mathematical Model of High-Frequency Wave Electromagnetic Processes in Power Transformers

19. Petro LEZHNIUK, Iryna KOTYLKO and Serhii KRAVCHUK.
Increasing Electric Network Reliability by Dispersed Generation

20. Gundebommu SREE LAKSHMI, Olena RUBANENKO and Iryna HUNKO.
Analysis of Three-level Diode Clamped Inverter for Grid-connected Renewable Energy Sources

21. Daniela GOMBÁRSKA, Milan SMETANA and Zuzana DROZDIKOVA.
Simulation of Electromagnetic Field Near Electronic Baby Monitor

September 17, 2019 Tuesday
Oral Session 3 (OS3)   10.00-11.20
Section 5. Signal Processing and Identification Aspects, Biomedicine

Chairs: Prof. Yuriy VASETSKY and Ivan MAKSYMIV

1. Konrad SOBOLEWSKI.
   Modeling and simulations in the earthing calculations

2. Mykhailo KLYMASH, Ivan DEMYDOV and Najm Ahmad BAYDOUN.
   The "Data Embassies" Concept as a Secure Communication Core for e-Gov implementing in Emerging States

3. Andrzej MAJKOWSKI, Majcin KOŁODZIEJ, Jakub PYSZCZAK, Paweł TARNOWSKI and Remigiusz RAK.
   Identification of gender based on speech signal

4. Paweł ZAWADZKI and Jacek STARZYŃSKI.
   Detecting gait anomalies based on the analysis of foot pressures

September 17, 2019 Tuesday
Oral Session 4 (OS4)   11.40-13.00
Section 1. Electromagnetic and Coupled Fields
Section 4. Measurements in Electrical Engineering

Chairs: Prof. Serhiy RENDZINYAK and Prof. Maros SMONDRK

1. Artur KRUPA and Bartosz SAWICKI.
   Numerical Model of Ohmic Heating for Random Aggregates

2. Sergii MIROSHNICHENKO, Oleksandra MIROSHNYCHENKO and Yurii KHOBTA.
   Optimization of Operating Parameters for Examinations of Race Horses on X-Ray Tomosynthesis Units

3. Andriy BOMBA and Igor MOROZ.
   Mathematical Modeling of Electromagnetic Fields in Irregular Waveguide

September 17, 2019 Tuesday

Oral Session 5 (OS5)   14.00-16.00

Section 2. Circuit and System Theory and its Application, Modeling and Algorithmization
Section 3. Power Engineering Theory, Electrical Machine and Apparatus
Section 4. Measurements in Electrical Engineering

Chairs: **Prof. Stanisław OSOWSKI and Bartosz SAWICKI**

1. Mykhailo KLYMASH, Yuliia PYRIH, Mykola KAIDAN and Volodymyr ANDRUSHCHAK.
   A Meta-Heuristic Data Routing Algorithm for Networks with Dynamically Variable Structure

2. Eugeniusz ROSOLOWSKI and Jan IZYKOWSKI.
   Fast Removal of Decaying Offset in Relaying Input Signals

3. Milan SMETANA, Daniela GOMBÁRSKA, Ladislav JANOUSEK and Vladimir CHUDACIK.
   Numerical Modeling of Artificial Surface Cracks in Eddy-Current Non-Destructive Evaluation

4. Jacek STARZYŃSKI and Jan SROKA.
   Improved Simulation Model of Electrical Breakdown in Air

5. Volodymyr TURKOVSKYI, Anton MALINOVSKYI, Andrii MUZYCHAK and Oleksandr TURKOVSKYI.
   The Simulation and Analysis of the Probabilistic Characteristics of Schemes for Power Supply of Electric Arc Furnaces in Non-Symmetric Modes

6. Leonid VISHNEVSKY, Igor VOYTETSKY and Taisiya VOYTETSKAYA.
   Marine Electrical Power Plant Dynamic Modes Evaluation Using a Fuzzy Inference System

September 17, 2019 Tuesday

Poster Session 2 (PS2)   16.30-18.30

Section 2. Circuit and System Theory and its Application, Modeling and Algorithmization
Section 3. Power Engineering Theory, Electrical Machine and Apparatus
Section 5. Signal Processing and Identification Aspects, Biomedicine
Section 6. Didactics in Electrical Engineering

Chairs: **Prof. Jacek STARZYŃSKI and Pavel KARBAN**

1. Borys KUZNETSOV, Ihor BOVDUI and Tatyana NIKITINA.
   Multiobjective Optimization of Electromechanical Servo Systems

2. Taras MEDVEDYK, Irena ANTONIUK and Solomiya LEBID.
   Influence of stress factors on cognitive tasks performance

3. Nataliia SUPRUNOVSKA and Anatolii SHCHERBA.
   Conditions for Limiting the Output Voltage of Double-circuit Semiconductor Discharge Installations with Positive Voltage Feedback

4. Nataliia SUPRUNOVSKA and Anatolii SHCHERBA.
   Method for Increasing the Rate of Current Rise in the Load of Electrical Discharge Installations

5. Sergii HERTSYK, Yuri GYZHKO, Valerij ZVARITCH, <u>Mykhailo MYSLOVYCH</u> and Ludviga OSTAPCHUK.
Features of the Construction of Autonomous Diagnostic Systems of Electrical Equipment, Taking into Account the Modes of Its Operation

6. <u>Yuriy SHAPOVALOV</u>, Dariya BACHYK, Ksenia DETSYK and Ivan SHAPOVALOV.
The Analysis of Linear Periodically-Time-Variable Circuits by the Frequency Symbolic Method with Application the D-Trees Method

7. <u>Zuzana JUDÁKOVÁ</u> and Ladislav JANOUŠEK.
Low Frequency Electromagnetic Field in Microenvironments and Their Possible Health Impacts

8. <u>Milan SMETANA</u>, Daniela GOMBÁRSKA, Ladislav JANOUSEK and Lukas BEHUN.
Crack Geometry Estimation Error in Eddy-Current Non-Destructive Inversion

9. Volodymyr EMETS and <u>Jan ROGOWSKI</u>.
Numerical Modelling of Diffraction by a Strip with Different Surface Impedances

10. Jiří MUŠKA, <u>Pavel KARBAN</u>, Iveta PETRÁŠOVÁ and <u>Ivo DOLEŽEL</u>.
Design of Linear Peristaltic Pump

11. Mykola KOSTIN, Tetiana MISHCHENKO, Vitalii LIASHUK, <u>Oksana HOHOLYUK</u> and <u>Petro STAKHIV</u>.
Transient Stochastic Processes in Power Circuits of Electric Transport Systems

12. Iveta PETRÁŠOVÁ, <u>Vaclav KOTLAN</u> and <u>Ivo DOLEZEL</u>.
Adjustment of Material Characteristics in Electroheat Problems

13. <u>Oksana HOHOLYUK</u>, <u>Zoriana BURKOVSKA</u> and Marcin CEGIELSKI.
Pedagogical Conditions of Formation of Professional Competencies of Specialists in the Sphere of Electrical Engineering

14. <u>Vsevolod HORYACHKO</u>, <u>Taras RYZHYI</u> and <u>Volodymyr BRYGILEVYCH</u>.
Mathematical Modeling of Electrocardiographic Processes Based on 3D Electric Circuit

15. <u>Alla DRANKOVA</u>, <u>Mykola MUKHA</u>, Sergiy MIKHAYKOV and Igor KRASOVSKYI.
Electromechanical Laboratory Complex for Power Quality Studies of the Ship Electrical System

16. <u>Maros SMONDRK</u> and Mariana BENOVA.
Effects of Body Tissues Dielectric Properties on Induced Voltage on Cardiac Pacemaker's Lead

17. Mikhail DIVIZINYUK, <u>Nataliya KASATKINA</u> and <u>Bohdan MELNYK</u>.
The Use of Electrical Monitoring and Surveillance Systems to Prevent Emergencies of a Terrorist Nature (on the Example of Motor Vehicles)

18. <u>Myroslav KISELYCHNYK</u> and Leonid NEDOSTUP.
Comprehensive Evaluation of the Effectiveness of Complex Systems

19. <u>Sergei TYKHOVOD</u> and Dmytro PATALAKH.
Calculation of Transients in Electrical Circuits at the Use of Solution Approximation by Tchebyshev's Polynomials

20. Yevhen KEDRIN, <u>Mykola DYVAK</u>, <u>Andriy PUKAS</u> and Iryna VOYTYUK.
System for Visualization the Map of Air Pollution by Vehicles

September 18, 2019 Wednesday
Closing Ceremony (Lviv Polytechnic)   11.00-11.30

Radymno
M10
Новояворівськ
Lviv
H02
Przemyśl
Sokilnyky
Сокільники
Sambir
Самбір
E471
Drohobych
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ki Dolne
🚗 **1 h 57 min**
136 km
szczadzki
Park
arodowy
Dolyna
Долина
Slavs'ke
E471
Polyana
Поляна
Svalyava
Synevyr