


Department of Theory of Electrical Engineering

# PROGRAM OF CPEE 2017



18th International Conference  
"Computational Problems of Electrical Engineering"



**CPEE  
2017** *Kutná Hora  
September 11-13, 2017*

## Sunday, September 10, 2017

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17:00 – 19:00	<b>Registration</b> (Hotel U Kata, Štefánikova 92, Post code 284 01, Kutná Hora, Czech Republic)
19:00 – 21:30	<b>Welcome party</b>

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## Monday, September 11, 2017

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07:00 – 09:00	<b>Breakfast</b>
08:30 – 09:00	<b>Registration</b> (Hotel U Kata, Štefánikova 92, Post code 284 01, Kutná Hora, Czech Republic)
09:00 – 09:20	<b>Opening Ceremony of the Conference CPEE 2017</b>
09:30 – 10:00	<b>Keynote lecture</b>
10:00 – 10:20	Conference photo
10:25 – 10:45	Coffee break
10:45 - 11:45	<b>Oral session O1</b> (Chairman: Ivo Doležel, Stanislaw Osowski)
11:55 – 12:55	<b>Poster session P1</b> (Chairman: Krzysztof Siwek)
13:00 – 14:30	<b>Lunch</b>
15:00 – 17:00	<b>Conference Trip</b>
17:30 – 19:00	<b>Dinner</b>
19:30 – 21:30	<b>Evening surprise</b>

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## Advanced Methods of the Theory of Electrical Engineering AMTEE 2017

A meeting of participants AMTEE 2017 takes place within the conference.

## Tuesday, September 12, 2017

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07:00 – 09:00	<b>Breakfast</b>
09:15 – 10:55	<b>Oral session O2</b> (Chairman: Oksana Hoholyuk, Václav Kotlan)
11:00 – 11:20	Coffee break
11:30 – 12:30	<b>Poster session P2</b> (Chairman: Bartosz Sawicki)
13:00 – 14:30	<b>Lunch</b>
14:30 – 15:30	<b>Poster session P3</b> (Chairman: Pavel Karban)
15:30 – 15:50	Coffee break
16:00 - 17:00	<b>Poster session P4</b> (Chairman: Ján Barabáš)
18:30 – 22:30	<b>Farewell party</b>

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## Wednesday, September 13, 2017

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07:00 – 09:00	<b>Breakfast</b>
09:00 – 10:00	<b>Poster session P5</b> (Chairman: František Mach)
10:00 – 10:20	Coffee break
10:20 – 11:40	<b>Oral session O3</b> (Chairman: Milan Smetana, Jacek Starzyński)
11:40 – 11:55	<b>Closing Ceremony</b> of the Conference CPEE 2017
12:00 – 13:30	<b>Lunch</b>

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### Information for the Presenters

- **Oral presentation - 20 minutes (including discussion),**  
format PowerPoint or Acrobat
- **Poster presentation - 60 minutes**

#### Poster format

We recommend to prepare the A1 poster size (portrait). Select the font size of your choice. The conference logo can be placed in the header, but it is not mandatory.

### Oral session O1

Chairman: Ivo Doležel, Stanislaw Osowski

Mykhaylo Zagirnyak, Serhii Serhiienko and Artur Fedotiev.	Improvement of the Qualitative Characteristics of an Automatic Control System with a Fractional-Order PID–Controller	<b>11</b>
Artur Krupa and Bartosz Sawicki..	Measurement-based stochastic models of biological materials	<b>41</b>
Jan Barabas, Ladislav Janoušek and Roman Radil.	Investigation of low frequency electromagnetic field (0-2kHz) excitation signal shape influence on <i>Saccharomyces cerevisiae</i> cell counts	<b>52</b>

### Oral session O2

Chairman: Oksana Hoholyuk, Václav Kotlan

Zagdkhorol Bayasgalan, Tsetsgee Bayasgalan and Francesco Muzi.	Improvement of the Dispatching Preplanning Process in Day-Ahead Electricity Market Using a Sequential Method	<b>1</b>
Fedor Sarapulov, Sergey Sarapulov and Ivan Smolyanov.	Research of Thermal Regimes of Linear Induction Motor	<b>7</b>
Krzysztof Siwek and Stanislaw Osowski.	Autoencoder versus PCA in face recognition	<b>9</b>
Zuzana Psenakova and Mariana Benova.	Evaluation of SAR (Specific Absorption Rate) in multilayer structure of biological tissues near ear with cochlear implant.	<b>26</b>
Tomasz Leś, Tomasz Markiewicz and Janusz Patera.	Automatic cell segmentation using L2 distance function	<b>39</b>

### Oral session O3

Chairman: Milan Smetana, Jacek Starzyński

Zdenka Benesova, Vaclav Kotlan and Rainer Haller.	Influence of transmission line wave properties on surge wave propagation	<b>13</b>
Jan Sroka	The Thru-Line calibration applied for Verification of Common Mode Absorption Devices	<b>19</b>
Jaroslav Kurek, Grzegorz Wieczorek, Bartosz Swiderski, Stanislaw Osowski, Michal Kruk and Albina Jegorowa.	Transfer learning in recognition of drill wear using convolutional neural network	<b>29</b>
Jakub Eichler, Miroslav Novák and Miloslav Košek	Computation Speed of Numeric Preisach Model	<b>58</b>

**Poster session P1****(Circuit Analysis, Optimization, Signal processing)**

Chairman: Krzysztof Siwek

Elena V. Ptitsyna, Alexandr B. Kuvaldin and Dmitry V. Ptitsyn.	Installations with optic radiators supplied complex waveform current	10	P1-01
Michał Filipiak and Ryszard Nawrowski.	Testing of efficiency and power transferred from the source to the receiver in various wireless power supply systems	25	P1-02
Wiesław Brociek, Robert Wilanowicz and Tomasz Grzywacz.	Propagation of higher harmonics of voltage and current in the power system at changing location of nonlinear load	33	P1-03
Yuriy Shapovalov, Bohdan Mandziy, Dariya Bachyk and Turyk Marian.	Identification Of Linear Periodically-Time-Variable Circuits In The System UDF MAOPCs	34	P1-04
Michaela Snajdarova, Stefan Borik and Ivo Cap.	Design of Measurement Device for Impedance Cardiography	37	P1-05
Kazimierz Mikołajuk and Andrzej Tobała.	Reference Signal Detection for Voltage Harmonic Damping in Three-Phase Systems	43	P1-06
Petro Stakhiv, Orest Hamola, Oksana Hoholyuk and Yuriy Kozak.	Comparing of effectiveness of transient processes calculation in electrotechnical devices using discrete models	46	P1-07
Kirill Bolotin, Vasiliy Frizen and Evgeny Shvidkiy.	Numerical And Experimental Simulation Of A Bottom Electromagnetic Stirrer With A Rotating Field	48	P1-08
Kirill Bolotin, Vasily Frizen, Aleksandr Koptyakov, Vladimir Lusgin and Dmitry Tomashevskiy.	Choice of compensating device for induction furnace with dual-frequency power supply	49	P1-09
Aneta Bugajska.	Impedance-Frequency Based Method of Transverse Fault Location in Medium Voltage Cable	56	P1-10
Miroslav Blohmann.	Upgrade 18 kW sensorless BLDC machine prototype to the hall-sensor controlled BLDC machine	63	P1-11

**Poster session P2****(Computational electromagnetics, Circuit Analysis, Engineering Applications)**

Chairman: Bartosz Sawicki

V. F. Emets and Jan Rogowski.	Scattering from a strip with PEC and partially PMC boundaries	2	P2-01
Arkadiusz Miaskowski and Mahendran Subramanian.	Specific Absorption Rate Parameter Model in Magnetic Hyperthermia	5	P2-02
Ivan Smolyanov, Vasiliy Frizen, Kirill Bolotin and Bohuš Ulrych.	Research of the Induction Heating Installation on Based Autoclave	14	P2-03
Tomáš Nazarčík and Zdeňka Benešová.	Modelling of the transients on the multi-circuit EHV/HV overhead transmission lines	16	P2-04
Tomasz Szczegielniak, Paweł Jabłoński, Zygmunt Piątek and Dariusz Kusiak.	Distribution of Temperature in the Extensive Plate	22	P2-05
Maros Smondrk, Mariana Benova and Zuzana Psenakova.	Evaluation of metallic implant influence on SAR distribution in a multilayered tissue model	40	P2-06
Sergey Bychkov, Fedor Tarasov, Vasiliy Frizen and Ivan Smolyanov.	Stamp tool induction heating system	44	P2-07

Iveta Petrášová, Pavel Karban, Oldřich Tureček, Stanislav Bouzek, Ladislav Zuzjak, Martin Schlosser and Roman Kroft.	Numerical Modeling of Acoustic Field of Loudspeaker	45	P2-08
Konrad Sobolewski and Andrzej Łasica.	Voltages induced in indoor installations of objects from nanoseconds impulses of electromagnetic fields	57	P2-09
Daniel Mayer and Bohuš Ulrych	The influence of magnetic storms on transformers of the power system	66	P2_10

### Poster session P3

(Numerical analysis, Engineering Applications)

Chairman: Pavel Karban

Vladislav Kuchanskyy.	The Prevention Measure of Resonance Overvoltages in Nonsinusoidal Modes	12	P3-01
Marek Wdowiak, Tomasz Markiewicz and Janusz Patera.	Novel algorithm for estimation of prognostic Ki-67 factor in selected view fields in breast cancer microscopic images	30	P3-02
Ryszard Szupiluk and Paweł Rubach.	Multivariate Decomposition and Noise Identification for Prediction Improvement	31	P3-03
Karel Slobodník.	Pulsed eddy current signal optimization	47	P3-04
Dariusz Strzęciwilk and Włodzimierz Zuberk.	Modeling and performance analysis of priority queuing systems	53	P3-05
Michał Wojciechowski.	Modelling of electric field distribution as a method for determining the possibility of PD developing in glass-epoxy laminate	55	P3-06
Andrzej Majkowski, Marcin Kołodziej, Dariusz Zapała, Paweł Tarnowski, Piotr Francuz, Remigiusz Rak and Łukasz Oskwarek.	Selection of EEG signal features for ERD/ERS classification using genetic algorithms	59	P3-07
Jan Kacerovský, Jan Brabec, František Mach and Pavel Karban.	Experimental Two-Stage Free-Fall Electrostatic Separator of Plastic Materials	62	P3-08
Jiří Kuthan and František Mach.	Magnetically Guided Actuation of Ferromagnetic Bodies on the Planar Surfaces: Numerical Modeling and Experimental Verification	64	P3-09
Karel Pospíšil and František Mach.	Numerical Analysis and Experimental Testing of Modular Bistable Electromagnetic Actuator in Valve Operation	65	P3-10

### Poster session P4

(Engineering Applications, Signal processing)

Chairman: Ján Barabáš

Marcin Kołodziej, Piotr Francuz, Andrzej Majkowski, Remigiusz Rak, Paweł Tarnowski and Paweł Augustynowicz.	Automatic identification of experts in visual arts	15	P4-01
Oleksandr Kozlovskiy, Dmitro Trushakov and Serhiy Rendzinyak.	Temperature Influence of Load Current of Overhead Electrical Distribution Networks in Difficult Weather Conditions	27	P4-02
Halyna Klym, Oleksandr Berezko, Ivanna Vasylychshyn and Andriy Ivanusa.	Development of Intelligent Computer System and Database for Microclimate Monitoring and Control	28	P4-03
Mikhail Rumyantsev and Alexey Sizyakin.	Research of rotors with permanent magnets and welded combined bandages for high-speed electrical machines	32	P4-04

Grzegorz Wieczorek, Bartosz Świdorski, Leszek J Chmielewski, Michał Kruk and Arkadiusz Orłowski.	Choice of Distance Function in the Segmentation of Regions of Interest in Microscopic Images of Breast Tissues	35	P4-05
Maxim Fedin, Alexander Kuvaldin and Alexei Kuleshov.	Theoretical investigation of induction heating of a two-layer conducting body by the example of an induction crucible furnace with a conductive crucible	36	P4-06
Mykola Dyvak, Andriy Pukas, Petro Stakhiv, Yurii Maslyiak and Marcin Cegielski.	Using a neural network with radial basis functions for task of recurrent laryngeal nerve monitoring based on electrophysiological approach	38	P4-07
Ladislav Janoušek, Andrea Štubendeková and Milan Smetana.	Impact of crack geometry on transmission frequency characteristics in eddy-current non-destructive evaluation	50	P4-08
Adam Jósko, Bogdan Dziadak and Jacek Starzyński.	Inductive sensors for stroke current and field measurements	51	P4-09
Zuzanna Krawczyk and Jacek Starzyński.	Segmentation of bone structures out of CT data: fusion of methods	54	P4-10

### Poster session P5

#### (Engineering Applications)

Chairman: František Mach

Bernard Fryskowski.	Application of Capacitance-to-Digital Converter to Investigate Dielectric Properties of Spark Plugs Insulators	3	P5-01
Omelyan Plakhtyna, Andriy Kutsyk, Mykola Semeniuk and Oleksiy Kuznyetsov.	Object-Oriented Program Environment for Electromechanical Systems Analysis Based on the Method of Average Voltages on Integration Step	4	P5-02
Yuriy Bobalo, Petro Stakhiv and Natalya Shakhovska.	Training studying system of electrical disciplines for students with special needs	6	P5-03
Marina Rashevskaya, Sergey Yanchenko, Sergey Tsyruk and Boris Kudrin.	Assessing non-stationary power quality phenomena of induction motors	17	P5-04
Karel Pavlíček, Václav Kotlan, Radek Soukup and Ivo Doležel.	Determination of Heat Flux for Needs of Modelling Multi-Layer Smart Protective Suit	18	P5-05
Milan Smetana, Vladimír Chudacik and Lukas Behun.	Investigation of Artificial Fatigue Cracks by Eddy Current Technique	20	P5-06
Mikhail Pogrebisskiy, Vladimir Kondrashov, Anatoliy Lykov and Valeriy Rabinovich.	Improving the engineering-and-economical performance of ore-thermal electric furnaces in the smelting of silicomanganese	21	P5-07
Mikhail Pogrebisskiy and Anton Parfyonov.	Research of process of controlled cooling of product in the vacuum-compression resistance furnace by method of finite-element modeling	23	P5-08
Mykhaylo Zagirnyak, Andrii Kalinov, Vita Ogar and Volodimir Lotous.	Experimental assessment of the accuracy of the method for determining the power on an induction motor shaft	24	P5-09
Ali Saygin and Alper Kerem.	Fuzzy logic based control of a loaded asynchronous motor using a 6-switched 3-level inverter	60	P5-10
Lenka Šroubová and Martin Šula	Electrostatic Separation of Agricultural Crops	67	P5-11

