

## PDES 2018 Conference Schedule

May 22<sup>nd</sup>, 2018

18:00 – 21:00 **Registration**

## PDES 2018 Conference Schedule

May 23<sup>rd</sup>, 2018 →

8:00 – 9:00 Breakfast

8:00 – 11:00 **Registration**

9:00 - 9:05 **Welcome words**  
Zdenek Slanina, Mikulas Huba

9:05 – 11:00 **Invited lectures**

Miroslav Iwachow (IBM)	IBM Architecture for Industry 4.0 and IIoT
Vladimir Sulc (IQRf Tech)	IQRf - Simply Connecting Things to IoT Through Wireless Mesh Networks

11:00 - 11:20 Coffee break

11:20 – 13:00 **Session A – Control Systems**  
Chair: Stepan Ozana

Stepan Ozana, Martin Pies	Predictive Protective Control for Flexible Energy System
Pavel Balda	Benchmarks of MATRIX Blockset for REX System
Milos Schlegel, Pavla Medvecova	Design of PI Controller: Hinf Region Approach
Ludek Buchta, Lukas Otava	Compensation of Dead-Time Effects Based on Kalman Filter for PMSM Drives
Kirill Chernyshov, Elena Jharko	An Information-Theoretic Approach to System Identification with Applying Tsallis Entropy
Kirill Chernyshov	Knowledge Based Identification of Non-Linear Systems

11:20 – 13:00 **Session A – Biomedical Systems**  
Chair: Andreas Drauschke

Radka Pavelkova, David Vala	Energy Harvesting Systems Using Human Body Motion
Richard Pasteka, Mathias Forjan, Andreas Drauschke	Comparison of Mathematical and Controlled Mechanical Lung Simulation in Active Breathing and Ventilated State
Lukas Peter, Norbert Noury, Martin Cerny	The New Approach for the Model of Cardiovascular System
Martin Uhlík, Zdenek Slanina, Vaclav Sladeczek	Cooling Device with Peltier Element for Medical Applications
Radana Kahankova, Radek Martinek, Rene Jaros, Jan Nedoma, Marcel Fajkus, Jan Vanus	Least Mean Squares Adaptive Algorithms Optimization for Fetal Phonocardiogram Extraction
Monika Borova, Jaromir Konecny, Michal Prauzek, Jakub Hlavica, Jiri Koziorek	Automated Diagnostic Method of Color Vision Disorders Integrated with a Hospital Information System

13:00 – 14:20 Lunch break

14:20 – 16:00 **Session C – Embedded Systems**  
Chair: Zdenek Bradac

Sultan Alharby, A. Weddell, J. Reeve, N. Harris	The Cost of Link Layer Security in IoT Embedded Devices
Jan Velicka, Martin Pies, Radovan Hajovsky	Wireless Measurement of Carbon Dioxide by Use of IQRf Technology
Karolina Janosova, Michal Prauzek, Jaromir Konecny, Radek Martinek, Jiri Koziorek, Jakub Hlavica	Low-Power Embedded Supply System: Li-Ion Battery with Gas-Gauge Case Study
Jaromir Konecny, Michal Prauzek, An Tran Hoang, Radek Martinek, Jakub Hlavica	Scan Matching Cross-Correlation-Based Localization Algorithm: Embedded Systems Implementation Perspective
Artem Yushev, Mohammed Barghash, Minh Phuong Nguyen, Andreas Walz, Axel Sikora	TLS-over-CAN: An Experimental Study of Internet-Grade End-to-End Communication Security for CAN Networks
Adam Gorski, Maciej J. Ogorzalek	Assignment of Unexpected Tasks for a Group of Embedded Systems

14:20 – 16:00 **Session D – Field Programmable Logic and High End Design Means**  
Chair: Adam Milik

Marcin Kubica, Adam Milik, Dariusz Kania	Technology Mapping of Multi-Output Function into LUT-Based FPGA
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	Wojciech Wojtkowski	Digital Control of a Bidirectional DC / DC Converter for Automotive Applications
	Mikulas Huba, Damir Vrancic	Introduction to the Discrete Time PIDmn Control for the IPDT Plant
	Jan Hudec	Automatic Software-Based Self Test Generation for Embedded Processors
	Adam Milik, Edward Hrynkiewicz	Hardware Mapping Strategies of PLC Programs in FPGAs
	Arkadiusz Gardecki, Michal Podpora, Aleksandra Kawala-Janik	Innovative Internet of Things-Reinforced Human Recognition for Human-Machine Interaction Purposes
16:00 – 16:20	Coffee break	
16:20 – 18:00 Praha	<b>Session E – Industrial applications</b> Chair: Frantisek Zezulka	
	Tomasz Szydlo, Robert Brzoza-Woch, Marek Konieczny	The Copernicus IoT Platform: Teaching IoT at Computer Science Case Study
	Frantisek Zezulka, Petr Marcon, Zdenek Bradac, Jakub Arm, Tomas Benesl, Ivo Vesely	Communication Systems for Industry 4.0 and the IIoT
	Antonin Gavlas, Jan Zwierzyna, Jiri Koziorek	Possibilities of Transfer Process Data from PLC to Cloud Platforms Based on IoT
	Jozef Mocnej, Martin Miskuf, Iveta Zolotova, Peter Papcun	Impact of Edge Computing Paradigm on Energy Consumption in IoT
	Jozef Mocnej, Winston Seah, Adrian Pekar, Iveta Zolotova	Decentralised IoT Architecture for Efficient Resources Utilisation
	Jiri Petnik, Jan Vanus	Design of Smart Home Implementation within IoT with Natural Language Interface
16:20 – 18:00 Budapest	<b>Session F – Signal Processing</b> Chair: Alexandra Kawala-Janik	
	Aleksandra Kawala-Janik, Tomasz Stach, Natalia Browarska	Initial Study on Using Emotiv EPOC+ Neuroheadset as a Control Device for Picture Script-Based Communicators
	Pavel Skrabanek	DeepGrapes: Precise Detection of Grapes in Low-Resolution Images
	Vaclav Kaczmarczyk, Zdenek Bradac, Tomas Benesl	Gabriela.NET: Modular platform for 1D and 2D data acquisition, processing and presentation
	Tomas Ondraczka, Zdenek Machacek, Jiri Koziorek, Lukas Ondraczka	Autonomous Recognition System for Skin Pigment Evaluation
	Jan Vanus, Tomas Weiper, Radek Martinek, Jan Nedoma, Marcel Fajkus, Ludvik Koval, Roman Hrbac	Assessment of the Quality of Speech Signal Processing within Voice Control of Operational-Technical Functions in the Smart Home by Means of the PESQ Algorithm
	Ondrej Bostik, Jan Klecka	Recognition of CAPTCHA Characters by Supervised Machine Learning Algorithms
19:00 –	Conference banquet	

## *PDES 2018 Conference Schedule*

- May 24<sup>th</sup>, 2018 -

8:00 – 9:00	Breakfast	
09:00 – 10:40 Praha	<b>Session G – Reliability and Safety of Elements, Circuits and Systems</b> Chair: Janusz Zalewski	
	Nary Subramanian, Janusz Zalewski	Safety and Security Analysis of Control Chains in SCADA Using the NFR Approach
	Stanislav Kepak, Jakub Cubik, Jan Nedoma, David Hruby, Stanislav Hejduk, Petr Zavodny, Marcel Fajkus, Vladimir Vasinek	Compact Fiber Optic Trackside Sensor for Rail Vehicle Detection and Analysis
	Miroslav Jirgl, Zdenek Bradac, Petr Fiedler	Human-in-the-Loop Issue in Context of the Cyber-Physical Systems
	Arkadiusz Gardecki, Michal Podpora, Aleksandra Kawala-Janik	Implementation of an External Laser Scanner into Control System of the NAO Robot
	Sebastian Temich, Damian Grzechca, Lukasz Chruszczyk, Krzysztof Tokarz	Spot Defect Analysis to Identify the Functional Parameters of a Voltage Controlled Oscillator
	Jakub Arm, Zdenek Bradac, Stefan Misik, Jakub Streit	Hardware-In-The-Loop CNC Motion Controller Verification
09:00 – 10:40 Budapest	<b>Session H – Signal Processing</b> Chair: Vaclav Kaczmarczyk	
	Ivo Vesely, Libor Vesely, Zdenek Bradac	MRAS Identification of Permanent Magnet Synchronous Motor Parameters
	Petr Gabrlik, Tomas Lazna	Simulation of Gamma Radiation Mapping Using an Unmanned Aerial System
	Vaclav Kaczmarczyk, Zdenek Bradac, Ondrej	An Industry 4.0 Testbed (Self-Acting Barman): Principles and Design

	Bastan, Jakub Arm	
	Tomas Benesl, Zdenek Bradac, Ondrej Bastan, Jakub Arm, Vaclav Kaczmarczyk	Methods to Decrease Power Consumption in Industrial Robotics
	David Vala, Martin Mikolajek	Proposal discharging station compatible with CHAdeMO automotive standard
	Martin Cala, Petr Benes	A Method for Estimation of Motor Rotational Speed from STFT Spectrogram at a Non-stationary Conditions
10:40 - 11:00	Coffee break	
11:00 - 12:00 Praha	<b>Session I – Embedded Systems</b> Chair: Zdenek Slanina	
	Tomas Docekal, Matej Golembiovsky	Low Cost Laboratory Plant for Control System Education
	Jiri Skovranek, Martin Pies, Radovan Hajovsky	Use of the IQRF and Node-RED Technology for Control and Visualization in an IQMESH Network
	Aleksandra Kawala-Janik, Magda Zolubak, Michal Podpora, Mariusz Pelc	Innovative Approach in AGILE Policies Validation in Control Systems
11:00 - 12:00 Budapest	<b>Session J – Reliability and Safety of Elements, Circuits and Systems</b> Chair: Petr Fiedler	
	Damian Grzechca, Pawel Rybka, Sebastian Temich	Module's Overheating Assessment with the Use of Supply Current Waveform Analysis
	David Smekal, Jan Hajny, Zdenek Martinasek	Comparative Analysis of Different Implementations of Encryption Algorithms on FPGA Network Cards
	Krzysztof Konopko, Dariusz Janczak	Classification Method Based on Multidimensional Probability Density Function Estimation Dedicated to Embedded Systems
12:00-14:00	Lunch break	
14:00-18:00	Lower Vitkovice Excursion, Free Program	
18:00-20:00	Dinner	
20:00-21:00	Poster Session Preparation	

<i>PDES 2018 Conference Schedule</i>		
← May 25 <sup>th</sup> , 2018		
08:00 – 09:00	Breakfast	
08:00 – 09:00	Poster Session Preparation	
09:00 – 10:00	IFAC organizers table	
09:00 – 11:00	<b>Session P – Poster Session</b> Chair:	
	Cerasela Camui, Octavian Mihai Ghita, Maria-Lavinia Iordache, Jean Pierre Cullman, Francisco Cristian Marchini	Centralizing The Order Sensors For Intelligent Housing Structure
	Radek Hrabuska, Michal Prauzek, Marketa Venclikova, Jaromir Konecny	Image Reconstruction for Electrical Impedance Tomography: Experimental Comparison of Radial Basis Neural Network and Gauss - Newton Method
	Andrzej Wojtulewicz, Maciej Lawrynczuk	Implementation of Multiple-Input Multiple-Output Dynamic Matrix Control Algorithm for Fast Processes Using Field Programmable Gate Array
	Kamil Czerwinski, Maciej Lawrynczuk	Dynamic Matrix Control Algorithm Implementation on ARM Cortex-R5 MCU: Performance Analysis
	Senad Zaimovic, Harun Siljak, Dejan Jokic	Artificial Colloquist: Treating Social Anxiety Disorder Using Altera FPGA
	Katerina Gecova, David Vala	Human Influence on the Microclimate of Buildings
	Mehmed Dug, Milos Krstic, Dejan Jokic	Implementation and Analysis of Methods for Error Detection and Correction on FPGA
	Jan Kubicek, Iveta Bryjova, Martin Augustynek, Marek Penhaker, Martin Cerny, David Oczka	Optimization of Laser Therapy Parameters in Dependence of Spot Size
	Jan Kubicek, Martin Cerny, Marek Penhaker, Martin Augustynek, Molnarova Kristyna, Jana Kosturikova, Ladislav Baleja	Modeling and Features Extraction of Blood Vessels Based on Soft Regional Segmentation
	Jan Vanus, Radek Martinek, Jan Nedoma, Marcel Fajkus, Pavel Valicek, Tomas Novak	Utilization of Interoperability between the BACnet and KNX Technologies for Monitoring of Operational-Technical Functions in Intelligent Buildings by Means of the PI System SW Tool
	Stefan Misik, Jakub Arm, Zdenek Bradac	Formulation and Simulation of Receding Horizon Control Over Mixed Logical Dynamical System

	Jan Vanus, Radek Martinek, Jan Nedoma, Marcel Fajkus, Daniel Cvejn, Pavel Valicek, Tomas Novak	Utilization of the LMS Algorithm to Filter the Predicted Course by Means of Neural Networks for Monitoring the Occupancy of Rooms in an Intelligent Administrative Building
	Matus Kozovsky, Petr Blaha	High Speed Operation Tests of Resolver Using AURIX Microcontroller Interface
	Roman Hrbac, Vaclav Kolar, Tomas Novak, Lukas Prokop, Jan Vanus	Low-Cost Solution of LED Driving, Designed for Tunable White Lighting Systems
	Tomas Urbanczyk, Jaromir Konecny, Jitka Zemanova	Mobile Applications Analyzing the Use of Central Operating Theatres
	Stepan Ozana, Milos Schlegel	Computation of Reference Trajectories for Inverted Pendulum with the Use of Two-Point BvP with Free Parameters
	Wojciech Wojtkowski, Andrzej Zankiewicz	Parallel RF Power Amplifiers Temperature Monitoring System Based on FPGA Device
	Jan Nedoma, Marcel Fajkus, Radek Martinek, Jan Vanus, Stanislav Kepak, Radana Kahankova, Rene Jaros, Daniel Cvejn, Michal Prauzek	Analysis of the Use of Fiber-Optic Sensors in the Road Traffic
	Jakub Kolarik, Matej Golembiovsky, Tomas Docekal, Radana Kahankova, Radek Martinek, Michal Prauzek	A Low-Cost Device for Fetal Heart Rate Measurement
	Miroslav Jirgl, Petr Fiedler, Zdenek Bradac	Testing the E PEAS Energy Management Circuit for Embedded Systems
	Tomas Lazna	The Visualization of Threats Using the Augmented Reality and a Remotely Controlled Robot
	Krzysztof Konopko, Dariusz Janczak	Nonlinear Signal Processing with Minimization of Spectral Distortion for Embedded Systems
	Hana Skutova, Radek Martinek, Rene Jaros, Radana Kahankova	A Noise Suppression Technique for Fetal Phonocardiogram Monitoring Using Adaptive Neuro-Fuzzy Interference System
	Lukas Malina, Lucie Popelova, Petr Dzurenda, Jan Hajny, Zdenek Martinasek	On Feasibility of Post-Quantum Cryptography on Small Devices
	Ondrej Bastan, Tomas Benesl, Petr Fiedler	Resiliency, the Path to Safety II
	Jakub Arm, Frantisek Zezulka, Zdenek Bradac, Petr Marcon, Vaclav Kaczmarczyk, Tomas Benesl	Implementing Industry 4.0 in Discrete Manufacturing: Options and Drawbacks
	Katarina Zakova, Matej Rabek	Remote Control of Thermo-opto-mechanical Plant Via Raspberry Pi
	Tomas Jilek, Frantisek Burian, Vlastimil Kriz	Odometry Calibration of a Chassis with Differential Steering
	Maciej Sadowski	Leakages from Devices of CATV System
	Jan Kotyza, Zdenek Machacek, Jiri Koziorek	Detection of Directions in an Image As a Method for Circle Detection
	Gabriel Gasparese	Driver Alcohol Detection System Based on Virtual Instrumentation
	Vaclav Kaczmarczyk, Radek Kuchta, Zdenka Kuchtova, Kadlec Jaroslav, Zuzana Kaczmarczykova	Data processing platform for indoor localization framework
	Lukas Peter, Martin Cerny	Fuzzy Classification of Hand's Motion
11:00 – 11:05	Final Speech and PDeS 2019 Preparation	
11:05 – 12:00	Lunch	
12:00 – 13:00	Industrial table I	
13:00 – 14:00	Industrial table II	