

DEPARTMENT OF MECHATRONICS AND ELECTRONICS

1 General Information

Department of Mechatronics and Electronics (KME) is part of the Faculty of Electrical Engineering at the University of Žilina. It is workplace which primary task is to train experts in area of electronics, industry automation, power-electronic and mechatronic systems on all levels of university education. Great importance is science-research activity of the department which is realized by variety of projects funded by international and national grants.

Department team is led by group of internationally recognized professors and associated professors with high scientific and educational erudition. Part of this group is also younger researchers and post-doctorate students. Strong part of collective is represented by intern doctorate students with significant participation in science-research activity.

The department supports wide variety of activities in addition to already mentioned. Department supports research for industrial, national and foreign subjects and variety of student's activities and projects.

Within the year the updating of laboratory equipment in the building AB was completed. Significant progress has been made in building of centres of excellence laboratories.

In the last year the research activity of the Department has achieved a significant increasing implemented by means of grant projects. Department staff participated in several international and national projects. Centres of Excellence CEEX2 and CEKR2 have been built within the frame of which the Department has cooperated with several prestigious Slovak institutions (SAS Košice, The Technical University of Košice and Jesenius Faculty of Medicine of the Comenius University in Martin). These projects represent a very significant support to research which has been done in our Department.

In the year 2014 the Department involves seventeen members of educational staff, three research workers, fifteen internal PhD students and six external PhD students. From the point of view of internal structure it has been divided into three divisions. The first one is focused on power- and applied electronics, the second one is operating in the field of mechatronics, autotronics, and industry automation. The third division deals with special electronics focused on applications in mechatronic systems and medicine.

The Department provides educational process at all three levels of the university study. The bachelor degree is covered by the accredited course of study for Electrical Engineering (specialization in Mechatronic Systems). Master degree includes the accredited course of study for Power Electronic Systems (in Power Electronics specialization and Mechatronic and Automotive Systems specialization). In doctorate study the department staff participated in providing training courses in Powerline Electronics, Automation and Telecommunications.

Within the frame of educational pedagogical operation the Department has been providing education of electronics, mechatronics, micro-computer systems involving industrial controllers and power electronics at the Faculty of Electrical Engineering, and also at further faculties of the University of Žilina. Such education has been dedicated for different study branches and specializations in the bachelor, magisterial and doctoral studies, both in internal and external ones.

The Department also has organized and provided research and development, expertizing and contracts, and develops publication activity in the field of electronics, control systems, mechatronics and power electronics mainly. Further education is provided by the Department in the field of power electronic systems, microcomputer control systems, industrial controllers and programmable logic systems.

Professional activities of the Department have been applied and disseminated on creation and operation of quality and reliable electronic devices and systems, application of programmable logic areas in design of electronic systems, reconfigurable circuits study as well as diagnostics and analyzing of the failures using image analysis. Topology

optimizing for power semiconductor converters and their electro-magnetic compatibility belongs to main activities of the Department.

In present time the Department operates with six laboratories dedicated for pedagogical operation, including final projects, final and master thesis providing. Beside above mentioned labs the Department offers for utilizing three high-tech workplaces dedicated for research and development activities and to experimental part of PhD study providing. It deals with the laboratory of power electronics, the laboratory of digital image processing and laboratories of digital signal processors and industrial programmable logic controllers.

2 Staff of the Department

Head of the Department: Pavol Špánik
Vice-head of the Department: Jozef Čuntala
Secretary for Education: Anna Kondelová
Administrative Support: Andrea Prandová

2.1 Sections of the Department

2.1.1 Section of Electronics

Head of the Section: Michal Frivaldský
Professors: Pavol Špánik
Associate Professors: Jozef Čuntala, Michal Frivaldský
Research Fellows: Anna Kondelová
Senior Lecturers (with PhD): Michal Praženica, Slavomír Kaščák,
Roman Radvan, Rastislav Havrila,
Senior Lecturers (without PhD): Jozef Lakatoš

2.1.2 Section of Mechatronic Systems and Autotronics

Head of the Section: Branislav Dobrucký
Professors: Branislav Dobrucký
Associate Professors: Pavel Pavlásek, Peter Drgoňa
Research Fellows: Marek Paškala, Ondrej Hock
Senior Lecturers (without PhD): Peter Šindler

2.1.3 Section of Special Electronics

Head of the Section: Libor Hargaš
Associate Professors: Libor Hargaš, Miroslav Hrianka,
Dušan Koniar, Anna Simonová
Senior Lecturers (with PhD): Rastislav Pavlanin

2.1.4 Postgraduate Students

Internal (full-time): Roman Radvan (until 31st August 2014), Andrej Rybovič (until 31st August 2014), Peter Čuboň (until 31st August 2014), Marek Valčo (until 31st August 2014), Jozef Šedo (until 31st August 2014), Juraj Koscelník, Martin Galád, Roman Mažgút, Tomáš Laškody, Zuzana Loncová (from 1st September 2013), Viliam Jaroš (from 1st September 2013), Juraj Košťál (from 1st September 2013), Pavol Štefanec (from 1st September 2013), Marek Píri (from 1st September 2013), Boris Kozáček (from 1st September 2013)

External (part-time): Marek Paškala, Ivan Šišťík, Ivan Lovás, Andrej Kaňovský,

Erika Záhorcová Polčanová, Anna Bystričanová Holásková

3 Teaching

3.1 Courses in Bachelor and Master Degree Programmes

3.1.1 Bachelor Degree Programmes

Code Title	Lessons-Seminars-Exercises		
	Semester	hours/week	Teachers
<i>Courses at the Faculty of Electrical Engineering</i>			
31212 Introduction to Industry Automation and Mechatronics	1;3	1-0-3	Pavlásek
31302 Electronics I	3	2-0-3	Čuntala
31402 Automatic Regulation 1	4	2-2-0	Simonová
31413 Electric Light and Heat	4	2-1-1	Pavlásek
31414 Electromagnetic Compatibility	4	2-2-0	Špáňik
31415 Electronics II	4	2-0-3	Hrianka
31426 Measurement of Non-Electric Parameters	4	2-0-2	Kállay
31427 Power Supplies	4	2-0-1	Špáňik
31430 Computers in Industrial Automation	4	2-0-2	Kállay
31502 Power Electronics	5	3-1-2	Špáňik
31511 Microprocessor Technology	5	3-0-2	Čuntala
31524 Logical Circuits	5	3-0-2	Hrianka
31528 Multimedia Technology	5	2-0-1	Pavlásek
31542 Image Processing and Analysis	5	2-0-2	Hrianka
31552 Computer and Office Technique	5	2-0-1	Pavlásek
31556 Mechatronics	5	2-0-2	Pavlásek
31557 Automatic Regulation 2	5	2-1-1	Simonová
31563 Design of Electronic Devices	6	2-2-6	Čuntala
31628 Power Semiconductor Systems	6	3-1-1	Špáňik
31630 Bachelor Project Power Electronic Systems	6	0-0-6	Simonová
31634 Bachelor Project Mechatronic Systems	6	0-0-6	Simonová
<i>Courses at the Faculty of Mechanical Engineering</i>			
2B092 Drives of Mechatronic Systems	5	2-0-1	Špáňik
2B127 Electronics	6	2-0-2	Čuntala

3.1.2 Master Degree Programmes

Code Title	Lessons-Seminars-Exercises		
	Semester	hours/week	Teachers
<i>Courses at the Faculty of Electrical Engineering</i>			
32107 Electromagnetic Compatibility in Electr.	1	2-2-0	Špáňik
32117 Design of ASIC	1	1-3-0	Čuntala
32119 Computers in Industrial Automation 2	1	2-0-2	Hargaš
32126 Control of Electric Actuators	1	3-1-1	Dobrucký
32129 Theory of Automatic Control 1	1	2-1-1	Simonová
32136 Power Semiconductor Converters	1	3-0-3	Špáňik

32200	Analysis and Synthesis of PE Circuits	2	2-2-0	Špánik
32211	Measurement and Digit. Data Processing	2	2-2-0	Pavlásek
32216	Microprocessors, Microcomputers and DSP	2	2-0-3	Dobrucký
32233	Microproc. and Microcomputer Systems	2	3-0-3	Dobrucký
32236	Theory of Automatic Control 2	2	2-1-1	Simonová
32325	Design of ASIC	2	2-2-0	Čuntala
32341	Virtual Instrumentation	2	2-0-2	Hargaš
32111	Information and Industrial Networks	3	2-0-2	Hargaš
32300	Power Electronics Applications in ET & EE	3	3-0-1	Dobrucký
32324	Design and Construction of PE Systems	3	2-2-0	Špánik
32330	Semiconductor Sensors	3	2-2-0	Lakatoš
32334	Semestral Project	3	0-4-0	Špánik
31515	Mechatronic Systems	3	2-0-2	Pavlásek
32402	Diploma Thesis PES	4	0-2-0	
32404	Diploma Seminar	4	0-2-0	Špánik
32405	Discrete Control of Power Systems	4	6-0-6	Dobrucký
32406	Dispatching Systems	4	4-0-4	Kállay
32416	Industrial Informatics	4	4-0-4	Hargaš

Courses at the Faculty of Mechanical Engineering

2N125	Electronic Control Elements	1,2	2-2-0	Špánik
2N246	Microcomputer Technics	1	2-0-2	Čuntala
2N140	Converter Drives	3	2-2-0	Špánik
2N141	Control Microcomputers	3	2-2-0	Dobrucký

Courses for Foreign Students – LLP/Erasmus Program

Course / Teacher / Student of University

32324	Design and Construction of PE Systems (<i>Frivaldský</i>), Luís Miguel Cunha Fernandes, Pedro Vasco de Barros Viana Saleiro Universidade do Porto, PT			
31502	Power Electronics / Dobrucký Bekir Bakar, Murat Pehlivanoglu, Erdem Bulut, Suleyman Guven, Yunus Emre Fedar, Uludag University, TR			
31528	Multimedia Technologies (<i>Pavlásek</i>), Bekir Bakar, Murat Pehlivanoglu, Erdem Bulut, Suleyman Guven, Yunus Emre Fedar, Uludag University, TR			
31542	Image Processing and Analysis / Hargaš, Koniar Bekir Bakar, Murat Pehlivanoglu, Erdem Bulut, Suleyman Guven, Yunus Emre Fedar, Uludag University, TR			
32233	Microprocessor and Microcomputer Systems / Dobrucký Erhan Kalyn, Uludag University, TR			

4 Research & Development

The Department also has organized and provided research and development, expertizing and contracts, and develops publication activity in the field of electronics, control systems, mechatronics and power electronics mainly.

Professional activities of the Department have been applied and disseminated on creation and operation of quality and reliable electronic devices and systems, application of programmable logic areas in design of electronic systems, reconfigurable circuits study as well as diagnostics and analyzing of the failures using image analysis. Topology optimizing for power semiconductor converters and their electro-magnetic compatibility belongs to main activities of the Department.

Research and Development Laboratories

4.1 Laboratory of Electromagnetic Compatibility

The laboratory is built nowadays. In laboratory, will be realized research in emission a resistance of convertors with high switching frequency.

4.2 Laboratory of Physical Models

The laboratory of physical models offers base for development of physical models. Laboratory contains basic mechanical and electronic tools and measurement devices for electronic circuits. Laboratory is accessible for both employees and students which are supervised.

4.3 Laboratory of Doctoral Research

Employees of the Department are dealing with science-research activity in analysis and design of power convertor systems, electromagnetic compatibility and image analysis in biomedicine. There are realized also computer simulations and verifications.

4.4 Laboratory of Low Power Drives Research

Laboratory is focused on research, design and testing of two-phase low power drives and perspective control structures for low power drives. Development of convertors for two-phase drives and experiments in field of sensor-less motor position determination is realized. Equipment of laboratory includes dSpace work station, measurement devices, oscilloscopes, function generators, power analyzer, power supplies, convertors and electrical motors.

Education and Research Laboratories

4.5 Laboratory of Power Electronics

Lessons of Power Electronics Systems.

4.6 Laboratory of Industrial Automation

Lessons of Industrial Automation application.

4.7 Laboratory of Control Systems

Lessons of Control Systems and DSP programming.

4.8 Laboratory of Logic Circuits

Lessons of the Logic Systems and research in area of digital image processing.

4.9 Laboratory of Microelectronics

Lessons of ASIC design and methods of control, analysis and synthesis of power systems.

5 Research and Educational Projects

5.1 National Projects

5.1.1 Research Projects Funded by the Scientific Grant Agency of the Slovak Republic (VEGA)

VEGA 1/0184/13: Research of indirect computing algorithms and tools for evaluation of power loss in power electronic device's component with support of physical model simulation postprocessing

Summary: Design and verification of methodology for evaluation of power losses of individual components of power electronic device, on the basis of dynamical measurement of surface thermal field, with use of thermal camera and comparison of thermal field of physical model with dynamical injection of power into individual component of this device.

Realization: 01/2013 – 12/2015

Coordinator: Peter Drgoňa

Co-operator: Jozef Čuntala, Anna Kondelová, Peter Šindler, Jozef Lakatoš, Onderej Hock, Peter Čuboň, Rastislav Pavlanin

VEGA 1/0579/14: Research of topological structures of segments of power electronic system for wireless energy transfer

Summary: The basis of the project is optimization of the main circuit topology of power electronic converters, primarily designed to control of energy flow in wireless energy transfer systems, with anticipated application in charging stations for electric cars. It deals about systems with frequency from 500kHz to 1,5Mhz at kW power range. The research will be focused on achieving the maximum efficiency of converter, and thus whole system, at required switching frequency. Baseline platform will be the analysis of properties of optimal energy transfer process, aimed on determination of the switching frequency. On the base of this platform, the research of possibilities of efficiency improvement will be realized, as well as their implementation through suitable technologies. During research of the project, verified scientific procedures, based on computer simulations will be used, as in time domain, as well as in 3D analysis. Experimentally verified results will be used in process of further applied research.

Realization: 01/2014 – 12/2016

Coordinator: Pavol Špánik

Co-operator: Branislav Dobrucký, Pavol Pavlásek, Peter Drgoňa, Anna Kondelová, Marek Paškala, Jozef Lakatoš, Slavomír Kaščák, Roman Radvan, Juraj Koscelník, Roman Mažgút

VEGA 1/0558/14: Research of methodology for optimization of lifetime of critical components in perspective electronic appliances through the use of system level simulation.

Summary: The project fundamental is research of procedure serving for estimation and possible optimization of critical components lifetime in perspective electronic systems (photovoltaic, LED luminaries). Method is based on selection of suitable simulation instruments, by which the system of multilevel simulation can be realized. Basis of the proposal is simultaneous run of multiple simulation instruments, where each serves for individual investigation of the

problem. Global result is subsequently represented as intersection of partial results. The investigation of operating condition itself (temperature, mechanical and electrical stresses, moisture, etc.), from the perspective of critical components aging (electrolytic capacitors, semiconductor devices), will be during multilevel simulation realized only by use of exact simulation models, with high degree of validity. The contribution of the project is in possible optimization of operation of electrical system, in order to increase the durability and economic return.

Realization: 01/2014 – 12/2016

Coordinator: Michal Frivaldský

Co-operator: Jozef Čuntala, Anna Simonová, Michal Praženica, Slavomír Kaščák, Roman Radvan, Jozef Šedo, Tomáš Laškody, Martin Galád

VEGA 1/0165/14: Pharmacological modulation of oscillation frequency of the respiratory epithelium cilia.

Summary: Mucociliary apparatus of the respiratory epithelium plays an important role in the cleansing of the respiratory tract from excessive amounts of mucus and other pathogens. Slowdown of the cilia motion leads to stagnation of phlegm in the respiratory tract, secondary infections, which require further treatment. Although there is more specialized information about the role of anti-asthmatics, expectorants and antitussives in the treatment of respiratory diseases, it is unknown how much the drug can pharmacologically affect the function of cilia in pathological conditions, in particular during respiratory tract inflammation. The results of our project would in future be applied in clinical practice in choosing the appropriate drug for the treatment of inflammatory respiratory diseases, which in addition to its primary role (bronchodilation, anti-inflammatory, antitussive and expectorant effect) also supported the defensive function of the mucociliary transport.

Realization: 01/2014 – 12/2016

Coordinator: Soňa Fraňová

Co-operator: Miroslav Hrianka, Libor Hargaš, Dušan Koniar

VEGA 1/0485/12: Deformation characteristics, fatigue and rheology of classic, recycled and viscoelastic composite materials.

Summary: Improving the safety and quality of traffic engineering are targets for the development of road construction. Knowledge of the deformation properties and fatigue life expressed by dynamic module of elasticity and fatigue coefficients express preconditions for the building and reconstruction of quality and safe traffic engineering. The result of the solution will be exploitation of new, dynamic methods for measuring of deformation properties of asphalt mixtures. The possibility of using recycled and composite materials in the construction of the road is assumed. The aim is to enhance the safety, quality and creating of conditions for the establishment of functional tests viscoelastic materials based on asphalt binders used in road construction.

Realization: 01/2012 – 12/2014

Coordinator: František Schlosser

Co-operator: Pavol Špánik, Ondrej Hock, Peter Šindler

KEGA 003STU-4/2014: Advanced methods of image processing used in visual systems and their implementation to the educational process.

Summary: Development of a new modern university textbooks and didactic tools requires innovative research in the scientific field. The effective usage of such research within the teaching process assumes a preparation on the methodology of this research in education process, creating of the modern didactic tools and

teaching aids, and university textbooks. The aim of the project is research in the field of advanced image processing in visual systems and the usage of such research especially in subjects of 1st, 2nd and 3rd level of university education. The ambition of the project is to create such aids and textbooks, which can be used in several technical disciplines and study programs at Slovak universities. There is an assumption, that they will be also used in specialized secondary schools or in the professional public.

The visual system as a sensory system is applied in a variety of technical areas, so this project has an interdisciplinary nature. With the development of visual systems hardware, it is needed to explore new and analyze existing image processing methods in these systems. The nature of the project presumes the employment of modern software and hardware resources into a teaching process. These resources will enable the students to better understand the possibilities of employment of visual systems in different technical areas. The content of the project is to explore advanced methods for filtering and image segmentation, identification of objects in the image, the reconstruction of 3D scenes from an image, and the detection of significant features in the image.

The project will also focus on progressive trends in the visual systems, including high-speed imaging in mechatronic systems or 3D interpretation of the scene

Realization: 01/2014 – 12/2016

Coordinator: František Duchoň

Co-operator: Libor Hargaš, Dušan Koniar

5.1.2 Research Projects Funded by the Slovak Research and Development Agency (APVV)

APVV-0138-10: Research and Development of the Small Power Drives with Two-phase Motors

Summary: Development of two-phase low power electric drives concerning to home appliances and industrial low power applications.

Realization: 05/2011 – 10/2014

Coordinator: Pavel Záskalický, TUKE Košice

Sub-Coordinator: Branislav Dobrucký

Co-operators: Michal Frivaldský, Peter Drgoňa, Michal Praženica, Ján Kašša, Slavomír Kaščák

APVV-0314-12: Research and Development of New Generation of Power Supplies Based on Converters with High Power Density, High Efficiency, Low EMI and Circular Energy

Summary: Project is focused on research and development of new generation of switched mode power supplies, which are based on LLC, LLCLC and LCTL topology with high power density and multifunction output and with double half-bridge DC/DC converter characterized by low circulating energy and low EMI. Co-operation with Elteco.

Realization: 10/2013 – 09/2017

Coordinator: Branislav Dobrucký

Co-operators: Pavol Špánik, Peter Šindler, Peter Drgoňa, Michal Frivaldský, Michal Praženica, Juraj Koscelník

APVV-0433-12: Research and Development of Intelligent System for Wireless Energy Transfer in Electromobility Application

Summary: The project is focused on problem of systems for wireless energy transfer, representing progressive solution for supplying of mobile and industrial devices. Task of this project is research of major effects on efficiency of systems for wireless energy transfer, usable for realization of charging points in the area of electromobility.

Realization: 10/2013 – 09/2017

Coordinator: Pavol Špánik

Co-operators: Libor Hargaš, Peter Drgoňa, Michal Frivaldský, Dušan Koniar, Michal Praženica, Ondrej Hock, Marek Valčo, Jozef Šedo, Peter Čuboň

5.1.3 Projects of European Structural Funds

ITMS 26220120046: CEEEX2 Centre of Power Electronic Systems and Materials for their Components, Operational Program Research and Development II

Summary: Completion and updating of workplaces of power electronic systems. Completion and updating of workplaces for power electronic system materials.

Realization: 09/2010 – 10/2014

Coordinator: Pavol Špánik, Branislav Dobrucký

Co-operators: Jozef Čuntala, Peter Šindler, Peter Drgoňa, Anna Simonová, Marek Paškala, Libor Hargaš, Michal Frivaldský, Pavel Pavlásek, Rastislav Pavlanin

ITMS 26220220078: Research of High-Economic components of Electric Drive Systems of Driving Traction Vehicles and Urban Mass Transportation Vehicles

Summary: Research of components of electric drive systems for electric locomotives and urban mass transportation vehicles using of latest principles, materials, circuit and construction solutions leading to primary energy savings, minimising of back influences onto supply system and emission minimising.

Realization: 09/2010 – 08/2014

Coordinator: Pavol Špánik

Co-operator: Fedor Kállay, Peter Šindler, Michal Frivaldský, Anna Kondelová, Peter Drgoňa, Marek Paškala, Slavomír Kaščák

ITMS 26110230089: Universities as engines of knowledge society development

Summary: Reform of educational system and professional training, modern education for a knowledge society.

Realization: 05/2013 – 11/2015

Coordinator: Helga Jančovičová, CVTI.

Co-operator: Pavlásek Pavel

ITMS 26110230079: Inovation and globalization of education – means for quality increasing at University of Žilina in European educational area

Realization: 02/2013 – 08/2015

Coordinator: Renáta Švarcová, ŽU

Co-operator: Branislav Dobrucký, Jozef Čuntala, Peter Drgoňa, Michal Frivaldský, Libor Hargaš, Dušan Koniar, Anna Simonova, Pavol Spanik, Miroslav Hrianka, Pavel Pavlásek

5.2 International Projects

5.2.1 International Scientific and Technological Co-operation Projects (MVTs)

RSF 14-49-00079: *New methods and algorithms of combined signal and image processing with unknown parameters in promising radars and communication systems*

Summary: The project solves the issue at the Moscow Energy Institute at the National Research University within the Department of Radio Equipment and Antenna systems

Realization: 10/2014 – 12/2014

Co-operators: Branislav Dobrucký

6 Co-operation

6.1 Co-operation Partners in Slovakia

EVPÚ a.s Nová Dubnica
Panasonic Electronic Devices Slovakia, s.r.o., Trstená
NES Nová Dubnica
Power-One, Dubnica nad Váhom
Siemens s.r.o., Bratislava, Žilina
Vedeckotechnologický park, Žilina
LJF Martin, UK Bratislava
ABB Slovakia, Bratislava
DataTherm, s.r.o. Žilina
Robotec s.r.o. Sučany
CONTINENTAL MATADOR s.r.o. Púchov
HAGARD: HALL a.s. Nitra, Žilina
IPESOFT s.r.o. Žilina
Považská cementáreň a.s., Ladce
Energo controls s.r.o. Žilina
ControlTech, s.r.o. Trnava
Schneider Electric Slovakia, s.r.o., Bratislava, Žilina
MACRO, s.r.o., Žilina
SSE, a.s. Žilina
Súkromná zvaračská škola, Žilina
Department of el. engineering, mechatronics and industrial engineering, FEI TU Košice
Department of mechatronic systems, FM TUAD, Trenčín
Department of automation and regulation, FEI STU, Bratislava
Department of electric machines and apparatus, FEI STU, Bratislava
INA Kysuce, a.s. Kysucké Nové Mesto
KIA Motors, s.r.o. Žilina
GRANIT, s.r.o. Žilina
AAUTO, s.r.o. Žilina
VIP AUTO, s.r.o. Žilina
TEAM DC, Bratislava
GS1 Slovakia, Žilina
Htest Slovakia, Banská Bystrica
SSC, Bratislava
NDS, Bratislava
SEMIKRON s.r.o. Vrbové
EMIS s.r.o. Bratislava
Pneustyle s.r.o. Žilina

AXONpro a.s. Bratislava
 Samsung Electronics Slovakia s.r.o. Galanta
 ŽOS Vrútky
 AEROMOBIL Nitra

6.2 International Co-operation Partners

Università degli studi di Catania, IT, DIEES, Prof. Alfio Consoli
 Panasonic Electronic Devices Co., Ltd., Kadoma, JPN
 Panasonic Electronic Devices Europe GmbH, Lüneburg, DE
 Politecnico di Bari, IT, DEE, Prof. Francesco Cupertino
 National University of Ireland, Dublin, IRL, Prof. Annroi de Paor
 Technikum Wien, AT, Prof. Felix Himmelstoss
 National Instruments Czech Republic, s.r.o., CZ, Peter Brieška
 Technical University RWTH Aachen, DE, Prof. Blazek Vladimir
 Politechnika Radomska, PL, Prof. Miroslav Luft, Assoc. Prof. Elzbieta Szychta
 XILINX USA, University program
 Humusoft s.r.o. Praha, CZ, Karel Bittner
 TU – VŠB Ostrava, CZ, Prof. Pavel Brandstetter, Prof. Petr Chlebiš
 FAIRCHILD Semiconductor - Power Franchise, EU
 FreeScale s.r.o., Rožňov pod Radhoštěm, CZ
 Rockwell Automotion s.r.o., Praha, CZ
 University Ioan Slavici, Timisoara, RO
 The University of Strathclyde, Glasgow, UK
 EQUINOCCIO Madrid, ES

6.3 Visitors to the Department

<i>Name</i>	<i>Institution</i>	<i>Length of stay</i>
Prof. Wojciech JARZYNA	Lublin University of Technology	1 month
Dariusz ZIELINSKI MSc	Lublin University of Technology	1 month
Piotr LIPNICKI MSc	Lublin University of Technology	1 day
Doc. Mario CACCIATO	UNICT Catania, IT	3 days
Prof. Volodymyr YASKIV	TNTU, Ternopil, UA	2 days
Doc. Valeryi LAZARYUK	TNTU, Ternopil, UA	2 days
Anna YASKIV	TNTU, Ternopil, UA	2 days

6.4 Visits to Foreign Institutions

<i>Name</i>	<i>Institution</i>	<i>Length of stay</i>
Prof. Ing. Branislav DOBRUCKÝ, PhD.	MEI, Moskva, RU	8 days
Prof. Ing. Branislav DOBRUCKÝ, PhD.	MEI, Moskva, RU	21 days
Prof. Ing. Pavol ŠPÁNIK, PhD.	UNICT Catania, IT	5 days
Doc. Ing. Michal FRIVALDSKÝ, PhD.	UNICT Catania, IT	5 days
Doc. Ing. Peter DRGOŇA, PhD.	UNICT Catania, IT	7 days
Doc. Ing. Miroslav HRIANKA, PhD.	RWTH – Aachen, DE	7 days
Doc. Ing. Pavel PAVLÁSEK, PhD.	EC, Brussel, BE	3 days

Participation in Foreign conferences:

Active:

Prof. Ing. Branislav Dobrucký, PhD.	SPEDAM 2014, Ischia, IT	5 days
Prof. Ing. Branislav Dobrucký, PhD.	XOPCONF, Segovia, ES	5 days
Prof. Ing. Branislav Dobrucký, PhD.	TRANSCOMP, Zakopané, PL	1 day

Doc. Ing. Pavel Pavlásek, PhD.	INTED 2014, Barcelona, ES	4 days
Ing. Peter Čuboň	POSTER 2014, Praha, CZ	3 days
Ing. Juraj Koscelník	POSTER 2014, Praha, CZ	3 days
Ing. Martin Galád	POSTER 2014, Praha, CZ	3 days
Ing. Roman Mažgút	POSTER 2014, Praha, CZ	3 days
Ing. Tomáš Laškody	POSTER 2014, Praha, CZ	3 days
Ing. Jozef Šedo	POSTER 2014, Praha, CZ	3 days
Ing. Juraj Koscelník	APPEL 2014, Plzeň, CZ	3 days
Ing. Tomáš Laškody	APPEL 2014, Plzeň, CZ	3 days
Doc. Ing. Michal Frivaldský, PhD.	APPEL 2014, Plzeň, CZ	3 days
Ing. Juraj Koscelník	EPNC 2014, Plzeň, CZ	2 days
Doc. Ing. Michal Frivaldský, PhD.	EPNC 2014, Plzeň, CZ	2 days
Prof. Ing. Pavol ŠPÁNIK, PhD.	SYMEP, Ostrava - Trojanovice, CZ	2 days
Ing. Juraj Koscelník	SYMEP, Ostrava - Trojanovice, CZ	2 days
Ing. Slavomír Kaščák, PhD.	SYMEP, Ostrava - Trojanovice, CZ	2 days
Ing. Juraj Koscelník	IECON, Dallas, TX, USA	5 days
Doc. Ing. Miroslav Hrianka, PhD.	SIO 2014, Houston, TX, USA	5 days
Doc. Ing. Libor Hargaš, PhD.	AE 2014, Plzeň, CZ	3 days
Prof. Ing. Branislav Dobrucký, PhD.	EduLearn 2014, Barcelona, ES	5 days
Prof. Ing. Branislav Dobrucký, PhD.	IEEE-ISIE 2014, Istanbul, TK	5 days
Prof. Ing. Branislav Dobrucký, PhD.	IN-TECH 2014, Leiria, PT	5 days

7 Other Activities

7.1 Conferences, Workshops, Symposiums Organized by the Department

- Joint Research Seminar of ED&EM Department of Lublin University of Technology and KME Department of Žilina University Focused on PhD Research Projects, 5th September 2014, University of Žilina, responsible organiser Pavol Špánik.

7.2 Specialized Lectures, Courses Organized by the Department

Title of Lecture/Course: eSeminar: QR Identifiers

Customer: GS1 SLOVAKIA, Department of Mechatronics and Electronics, University of Žilina

Lecturer: Pavel Pavlásek

Date: 8th December 2014

Title of Lecture/Course: Identification Chain of Goods and Services

Customer: GS1 SLOVAKIA, Department of Mechatronics and Electronics, University of Žilina

Lecturer: Miroslav Štaffen, Pavel Pavlásek

Date: 9th December 2014

Title of Lecture/Course: Control of Tunnel Operation

Distant Education for Operators at the Bôrik Tunnel

Customer: SSC

Lecturer: Fedor Kállay, Marek Paškala

Date: September 2014

Title of Lecture/Course: Café scientifique

Popular Educational Lectures for the public

Customer: JLF UK Martin

Lecturer: Miroslav Hrianka, Libor Hargaš, Dušan Koniar

Date: 29th January 2014

Title of Lecture/Course: 04-KAP-EF/2014 Training courses for employees of Visteon Electronics Slovakia, s.r.o - Basic Course

Customer: Visteon Electronics Slovakia, s.r.o. - Establishment Námestovo

Lecturer: Peter Drgoňa

Date: 09/2014 – 12/2014

Competition: The Technical Idea of the Year

Participants: Secondary school students

Organizers: Pavol Špánik, Michal Frivaldský, Roman Radvan, Ondrej Hock

Date: 5th June 2014

7.3 Membership in International Institutions/Committees

- Branislav Dobrucký - Senior Member of IEEE IE Society
 - Reviewer for Publishing Company Elsevier, NL
 - Reviewer for EPE journal, Brussels, BE
 - Member of SMTC 2014 Evaluation Committee - competition
- Pavel Pavlásek - Member of the Editorial Board of the Inžinierske stavby Journal
 - Member of Brandon Hall Excellence in Learning Technology Awards
 - Expert of EC H2020 SMEINST
 - Member of European Committee expert team of science and research
- Pavol Špánik - Senior Member of IEEE IE Society
 - Member of the Scientific Board of FEI – TU Ostrava, CZ
 - Member of the Electronics Committee, FEI – TU Ostrava, CZ
- Michal Frivaldský - Member of IEEE IE Society
 Peter Drgoňa - Member of IEEE IE Society

7.4 Membership in National Institutions/Committees

- Branislav Dobrucký - Steering Programme Committee of ALER 2014 Conference
 - Steering Programme Committee of ELEKTRO 2014 Conference
- Pavel Pavlásek - Member of the Commission of Transport and Road Administration Port (The Žilina Self-governing region)
 - Member of the Commission of the Ministry of Education of Slovak Republic for Selection of the Aid of Candidates from Developing Countries and Compatriots
- Pavol Špánik - Member of the Working Group „Industry Technologies“ at Ministry of Education, Science, Research and Sport of the Slovak Republic
 - Member of the Working Group „Electro-mobility“ at Ministry of Economy of the Slovak Republic
 - Member of the Grant Commission for Scientific Grant Agency of the Slovak Republic VEGA No 5 for electrical engineering and informatics

7.5 Membership in University Boards

- Branislav Dobrucký - Member of the Editorial Board of ZU Scientific Journal – Communication – Scientific Letters
 - Member of the Scientific Board of FEE ZU
 - Member of the Electrical Engineering Committee, FEE ZU
 - Member of the Automation and Control Committee – Process Control, FEE ZU
- Pavol Špánik - Member of the Senate of ZU
 - Member of the Academic Senate of FEE ZU
 - Member of the Scientific Board of ZU

- Member of the Scientific Board of FEE ZU
 - Member of the Electrical Engineering Committee, FEE ZU
 - Member of the Power Engineering Committee, FEE ZU
 - Member of the Automation and Control Committee – Process Control, FEE ZU
 - Member of the Measurement Technique Committee, FEI TU Košice
 - Member of the Technical Subjects Didactics Committee, UKF Nitra
 - Member of the Academic Senate of FEE ZU
- Pavel Pavlásek
Michal Frivaldský

7.6 Awards

Juraj Koscelník – Student Travel Scholarship, award for the best student contribution to the conference – IEEE - IECON 2014 – October 29 – November 11, 2014, Dallas, TX - USA

8 Publications

Journals Indexed in a World-Wide Database (Thomson Scientific Master Journal List, Scopus)

- [1] **SPANIK, P., FRIVALDSKY, M., DRGONA, P., CUNTALA, J., GLAPA, N.**
Design procedure of simple and accurate model of electric double layer capacitor (EDLC) targeting fast verification purposes of heat transfer simulations,
In: *Electrical Engineering - Archiv für Elektrotechnik*, SPRINGER, 2014, 2/96, ISSN 0948-7921, ISSN 1432-0487, Electr Eng DOI 10.1007/s00202-013-0284-8, pp. 121-134, Thomson
- [2] **FRIVALDSKY, M., CUNTALA, J., SPANIK, P.**
Simple and accurate thermal simulation model of super capacitor suitable for development of module solutions,
In: *International Journal of Thermal Sciences*, Elsevier, Vol. 84, October 2014, pp. 34–47, ISSN 1290-0729, DOI: 10.1016/j.ijthermalsci.2014.04.005, Thomson
- [3] **ZASKALICKY, P., DOBRUCKY, B., PRAZENICA, M.**
Analysis and Modeling of Converter with PWM Output for Two-Phase Applications,
In: *Electronics and Electrical Engineering*, Vol. 20, No. 1 (2014), Kaunas 2014, pp. 25-28, ISSN 1392–1215, Thomson
- [4] **MIKOVA, L., KELEMEN, M., KONIAR, D.**
Mathematical Model of Four Wheeled Mobile Robot and its Experimental Verification,
In: *Applied Mechanics and Materials, Applied Mechanics and Mechatronics*, Vol. 611, 2014, pp. 130-137, ISSN 1660- 9336, Thomson
- [5] **HARGAS, L., KONIAR, D., SIMONOVA, A., HRIANKA, M., LONCOVA, Z.**
Novel Machine Vision Tools Applied in Biomechatronic Tasks
In: *Procedia Engineering (Modelling of Mechanical and Mechatronic Systems)*, Vol. 96, 2014, pp. 148 - 156, ISSN 1877-7058, Thomson
- [6] **KONIAR, D., HARGAS, L., SIMONOVA, A., HRIANKA, M., LONCOVA, Z.**
Virtual Instrumentation for Visual Inspection in Mechatronic Applications
In: *Procedia Engineering (Modelling of Mechanical and Mechatronic Systems)*, Vol. 96, 2014, pp. 227 - 234, ISSN 1877-7058, Thomson
- [7] **FRIVALDSKY, M., SPANIK, P., KANOVSKY, A.**
Optimization Steps of lifetime extension of el-caps in dedicated applications

- In: *International Review of Electrical Engineering – IREE*, Vol. 9, No. 3, 2014, pp. 663-670, ISSN 1827-6660, Scopus,
- [8] **GALAD, M., SEDO, J., SPANIK, P.**
Developing of Stand-Along Power System Simulation Model
In: *International Review of Automatic Control -- IREACO*, Vol. 7, No. 5, 2014, pp. 500-505, ISSN 1974-6059, Scopus
- [9] **DOBRUCKY, B., LASKODY, T., PRAZENICA, M., KASCAK, S.**
Analysis of VSI and MxC Converters Fed Two-Phase Induction Motor with the Same Magnitude of Fundamental Harmonic Voltages
In: *International Review of Electrical Engineering - IREE*, Vol. 9, No. 5 2014, pp. 989-902, ISSN 1827-6660, Scopus

Journals Indexed in a EBSCO Database (DAVID Publishing, AEEE ...)

- [10] **DOBRUCKY, B., POKORNY, M., BENOVA, M.**
On Impulse Switching Functions of Inverters as an Orthogonal System
In: *Journal of Mathematics and System Science*, Vol. 4, No. , 2014, USA, ISSN 2159-5291, ISSN online 2159-5305

Other Reviewed Foreign Journals

- [11] **KASCAK, S.**
Analysis of HF half-bridge matrix converter
In: *Electroscope*, 1/2014, ISSN 1802-4564
- [12] **LASKODY, T., KASCAK, S., PRAZENICA, M.**
Space vector PWM for two-phase inverter with three legs in Matlab-Simulink
In: *Electroscope*, 1/2014, ISSN 1802-4564
- [13] **KASCAK, S., PRAZENICA, M.**
Two-stage two-phase system with orthogonal output using single-phase matrix converters
In: *Electroscope*, 1/2014, ISSN 1802-4564
- [14] **RAFAJDUS, P., VAVRUS, V., KUDELČIK, J., DOBRUCKY, B.**
Investigation of DC and AC Energy Transfer Transients for Ultra Deep Wells
In: *Transactions on Electrical Engineering*, Vol. 3, No 2, CZ, ISSN 1805-3386

Other Reviewed Slovak Journals

- [15] **CUBON, P., RADVAN, R., STANCEK, J.**
Calculation of the required power for electric vehicles drive
In: *Časopis pre elektrotechniku, elektroenergetiku, informačné a komunikačné technológie*, The magazine for electrical engineering, power engineering, information and communication technologies No. 20, Vol. 4, 2014, SK, ISSN 1335-2547 (in Slovak)

Papers in proceedings of the world congress/conference published in prestigious foreign publisher such as Springer, Kluwer, Elsevier, John Wiley etc., or published by world-wide reputable scientific institutions such as IFAC, IFIP, IEEE, ACM, IET, SPIE, or listed in Web of Science

- [16] **PAVLASEK, P.**

- Adaptive Educational Environment: Creating a Culture of Innovation to Support Student's Practical Key Competences Development*,
In: *8th International Technology, Education and Development Conference*
Valencia - 10th - 12th March 2014, pp. 7488-7497, ISBN 978-84-616-8412-0, ISSN 2340-1079, Thomson
- [17] **PAVLASEK, P., HIVESOVA, D.**
Learning and Teaching Styles: The Optimal Method of Creating the Most Effective Textbooks on Secondary Vocational Schools
In: *8th International Technology, Education and Development Conference*
Valencia - 10th - 12th March 2014, pp. 7519-7527, ISBN 978-84-616-8412-0, ISSN 2340-1079, Thomson
- [18] **LASKODY, T., DOBRUCKY, B., KASCAK, S., PRAZENICA, M.**
2-Phase Direct Torque Controlled IM Drive using SVPWM with Torque Ripple Reduction: Motoring and Regenerating
In: *ISIE 2014, 23rd International Symposium on Industrial Electronics*, 1-4 June 2014, ISTANBUL, pp. 698 - 702, IEEE Catalog Number: CFP14ISI-USB ISBN: 978-1-4799-2398-4, Thomson
- [19] **LUSKOVA, M., DOBRUCKY, B.**
INNOVATION AND INTERNATIONALIZATION OF HIGHER EDUCATION AS MEANS OF QUALITY IMPROVEMENT AT THE UNIVERSITY OF ZILINA
In: *6th International Conference on Education and New Learning Technologies Barcelona, Spain. 7-9 July, 2014*, IATED, pp. 7048-7055, ISBN 978-84-617-0557-3, ISSN: 2340-1117, Thomson
- [20] **FRIVALDSKY M., DOBRUCKY B., KOSCELNIK J., PRAZENICA, M.**
Multiresonant LCL2C2 Tank Converter
In: *40th Annual Conference of the IEEE Industrial Electronics Society IECON'2014*, Dallas, TX – USA, October 29 - November 1, 2014, pp. - , IEEE, ISSN, ISBN, Thomson
- [21] **FRIVALDSKY M., DOBRUCKY B., SPANIK P., KOSCELNIK J.**
A Novel B3C Converter
In: *Applied Electronics 2014, 19th international conference*, IEEE, pp. 87-92, ISSN 1803-7232, ISBN 978-80-261-0276-2, Thomson
- [22] **FRIVALDSKY M., SPANIK P., DRGONA P., KOSCELNIK J.**
Indirect Investigation of Heat Transfer of Electronic System
In: *Applied Electronics 2014, 19th international conference*, IEEE, pp. 93-98, ISSN 1803-7232, ISBN 978-80-261-0276-2, Thomson
- [23] **HARGAS L., KONIAR D., HRIANKA M., DURDIK P., BANOVCIN P.**
Moving Object Searching Based on Virtual Instrumentation
In: *Applied Electronics 2014, 19th international conference*, IEEE, pp. 99-102, ISSN 1803-7232, ISBN 978-80-261-0276-2, Thomson
- [24] **KOSCELNIK, J., SEDO, J., DOBRUCKY, B.**
Modeling of Resonant Converter with Nonlinear Inductance
In: *Applied Electronics 2014, 19th international conference*, IEEE, pp. 153-156, ISSN 1803-7232, ISBN 978-80-261-0276-2, Thomson
- [25] **LASKODY T., PRAZENICA M., KASCAK S.**
Space Vector Pulse Width Modulation for Two-Phase Two-Stage Matrix Converter with Four Legs
In: *Applied Electronics 2014, 19th international conference*, IEEE, pp. 181-184, ISSN 1803-7232, ISBN 978-80-261-0276-2, Thomson
- [26] **ZASKALICKY, P., DOBRUCKY, B.**
Analytical Method of a Torque Ripple Calculation for Two-Phase IM Supplied by Three-Leg SPWM Inverter

- In: *2014 International Symposium on Power Electronics, Electrical Drives, Automation and Motion SPEEDAM*, Ischia, Italy, 18th – 20th June, 2014, IEEE, IEEE Catalog Number: CFP1448A-USB, ISBN: 978-1-4799-4750-8
- [27] **CUBON, P., SEDO, J., RADVAN, R., STANCEK, J., SPANIK, P., URICEK, J.,**
Calculation of demand of electric power of small electric vehicle using Matlab GUI
In: *10th International Conference ELEKTRO 2014*, Rajecke Teplice, Slovakia, 19-20 May, 2014, IEEE, pp. 149-153, Catalog number: CFP1448S-CDR, ISBN: 978-1-4799-3720-2, Scopus
- [28] **FRIVALDSKY, M., SPANIK, P., DRGONA, P., HOCK, O.**
Influence of Transformer Core Geometry on the Qualitative Indexes of Front-end Converters
In: *10th International Conference ELEKTRO 2014*, Rajecke Teplice, Slovakia, 19-20 May, 2014, IEEE, pp. 170-174, Catalog number: CFP1448S-CDR, ISBN: 978-1-4799-3720-2, Scopus
- [29] **HOCK, O., DRGONA, P., PASKALA, M.**
Simulation Model of Adjustable Arm Using Denavit-Hartenberg Parameters
In: *10th International Conference ELEKTRO 2014*, Rajecke Teplice, Slovakia, 19-20 May, 2014, IEEE, pp. 176-179, Catalog number: CFP1448S-CDR, ISBN: 978-1-4799-3720-2, Scopus
- [30] **MAZGUT, R., SPANIK, P., KOSCELNIK, J., SINDLER, P.**
The measurement of balance by the accelerometer and gyroscope
In: *10th International Conference ELEKTRO 2014*, Rajecke Teplice, Slovakia, 19-20 May, 2014, IEEE, pp. 192-196, Catalog number: CFP1448S-CDR, ISBN: 978-1-4799-3720-2, Scopus
- [31] **SPANIK, P., FRIVALDSKY, M., DRGONA, P.**
Optimization Procedure for Selection of Active Components of DC-DC Converter's Thermal Simulation Model
In: *10th International Conference ELEKTRO 2014*, Rajecke Teplice, Slovakia, 19-20 May, 2014, IEEE, pp. 227-231, Catalog number: CFP1448S-CDR, ISBN: 978-1-4799-3720-2, Scopus
- [32] **SPANIK, P., FRIVALDSKY, M., KANOVSKY, A.**
Life Time of the Electrolytic Capacitors in Power Applications
In: *10th International Conference ELEKTRO 2014*, Rajecke Teplice, Slovakia, 19-20 May, 2014, IEEE, pp. 233-237, Catalog number: CFP1448S-CDR, ISBN: 978-1-4799-3720-2, Scopus
- [33] **GALAD, M., SPANIK, P.**
Design of Photovoltaic Solar Cell Model for Stand-alone Renewable System
In: *10th International Conference ELEKTRO 2014*, Rajecke Teplice, Slovakia, 19-20 May, 2014, IEEE, pp. 285-288, Catalog number: CFP1448S-CDR, ISBN: 978-1-4799-3720-2, Scopus
- [34] **KOSCELNIK, J., PRAZENICA, M., FRIVALDSKY, M., ONDIRKO S.**
Design and Simulation of Multi-element Resonant LCTLC Converter with HF Transformer
In: *10th International Conference ELEKTRO 2014*, Rajecke Teplice, Slovakia, 19-20 May, 2014, IEEE, pp. 307-311, Catalog number: CFP1448S-CDR, ISBN: 978-1-4799-3720-2, Scopus
- [35] **KOSCELNIK, J., FRIVALDSKY, M., PRAZENICA, M., MAZGUT, R.**
A Review of Multi-elements Resonant Converters Topologies

- In: *10th International Conference ELEKTRO 2014*, Rajecke Teplice, Slovakia, 19-20 May, 2014, IEEE, pp. 312-317, Catalog number: CFP1448S-CDR, ISBN: 978-1-4799-3720-2, Scopus
- [36] **LASKODY, T., PRAZENICA, M., KASCAK, S.**
Space Vector PWM for Two-Phase Four-Leg Matrix Converter
In: *10th International Conference ELEKTRO 2014*, Rajecke Teplice, Slovakia, 19-20 May, 2014, IEEE, pp. 234-327, Catalog number: CFP1448S-CDR, ISBN: 978-1-4799-3720-2, Scopus
- [37] **LASKODY, T., KASCAK, S., PRAZENICA, M.**
Space Vector PWM for Two-Phase Two-Leg Matrix Converter
In: *10th International Conference ELEKTRO 2014*, Rajecke Teplice, Slovakia, 19-20 May, 2014, IEEE, pp. 328-331, Catalog number: CFP1448S-CDR, ISBN: 978-1-4799-3720-2, Scopus
- [38] **VALCO, M., SINDLER, P., SEDO, J., KUČHTA, J.**
Inverter Output Voltage Under Different Type of Loads
In: *10th International Conference ELEKTRO 2014*, Rajecke Teplice, Slovakia, 19-20 May, 2014, IEEE, pp. 383-388, Catalog number: CFP1448S-CDR, ISBN: 978-1-4799-3720-2, Scopus
- [39] **VAVRUS, V., DOBRUCKY, B.**
Three Phase AC Cable Over-Voltages Analysis for Ultra-Deep Wells Supplying
In: *10th International Conference ELEKTRO 2014*, Rajecke Teplice, Slovakia, 19-20 May, 2014, IEEE, pp. 389-394, Catalog number: CFP1448S-CDR, ISBN: 978-1-4799-3720-2, Scopus
- [40] **KONDELOVA, A., CUNTALA, J.**
Time Models of Dynamic and Static Reconfiguration in FPGAs
In: *10th International Conference ELEKTRO 2014*, Rajecke Teplice, Slovakia, 19-20 May, 2014, IEEE, pp. 451-454, Catalog number: CFP1448S-CDR, ISBN: 978-1-4799-3720-2, Scopus
- [41] **HARGAS, L., KONIAR, D., HRIANKA, M., SIMONOVA, A., DURDIK, P., BANOVCIN, P.**
Adjusting and Conditioning of High Speed Videosequences for Diagnostic Purposes in Medicine
In: *10th International Conference ELEKTRO 2014*, Rajecke Teplice, Slovakia, 19-20 May, 2014, IEEE, pp. 548-552, Catalog number: CFP1448S-CDR, ISBN: 978-1-4799-3720-2, Scopus
- [42] **HARGAS, L., KONIAR, D., HRIANKA, M., DURDIK, P., BANOVCIN, P.**
Integration of LabVIEW-based Virtual Instruments to Modern Spirology Diagnostics
In: *10th International Conference ELEKTRO 2014*, Rajecke Teplice, Slovakia, 19-20 May, 2014, IEEE, pp. 553-557, Catalog number: CFP1448S-CDR, ISBN: 978-1-4799-3720-2, Scopus
- [43] **FEDOR, T., VITTEK, J., SINDLER, P.**
Influence of variable moment of inertia in robot servo motor control,
In: *10th International Conference ELEKTRO 2014*, Rajecke Teplice, Slovakia, 19-20 May, 2014, IEEE, pp. 165-169, Catalog number: CFP1448S-CDR, ISBN: 978-1-4799-3720-2, Scopus
- Reviewed Conference Proceedings Abroad (if not included above)**
- [44] **CUBON, P., RADVAN, R., SEDO, J., STANCEK, J.**
Review of Promising Balancing System for LION Batteries

- In: *18th International Student Conference on Electrical Engineering POSTER 2014*, May 15, 2014, CVUT Prague, PE10 – PE 067, ISBN 978-80-01-05499-4
- [45] **SEDO, J., GALAD, M.**
Stand-Alone Power System Simulation
In: *18th International Student Conference on Electrical Engineering POSTER 2014*, May 15, 2014, CVUT Prague, PE16 – PE 106, ISBN 978-80-01-05499-4
- [46] **LASKODY, T., MAZGUT, R., GALAD, M.**
Space Vector PWM for Two-Phase Matrix Converter with Two Legs
In: *18th International Student Conference on Electrical Engineering POSTER 2014*, May 15, 2014, CVUT Prague, PE17 – PE 129, ISBN 978-80-01-05499-4
- [47] **MAZGUT, R., LASKODY, T., KOSCELNIK, J., SEDO, J.**
The Application for the Design of the Resonant Converter
In: *18th International Student Conference on Electrical Engineering POSTER 2014*, May 15, 2014, CVUT Prague, PE18 – PE 130, ISBN 978-80-01-05499-4
- [48] **KOSCELNIK, J., SEDO, J., MAZGUT, R.**
Modeling of Nonlinear Inductance in Resonant Circuit
In: *18th International Student Conference on Electrical Engineering POSTER 2014*, May 15, 2014, CVUT Prague, PE19 – PE 136, ISBN 978-80-01-05499-4
- [49] **DOBRUCKY, B., FRIVALDSKY, M., KOSCELNIK, J.**
Analysis and Multiply Simulation of LCTLC Non-Linear Inverter Circuitry
In: *XXIII Symposium – Electromagnetic Phenomena in Nonlinear Circuits*, Pilsen, CZ, 23/2014, ISBN 978-83-62712-00-7
- [50] **DOBRUCKY, B., FRIVALDSKY, M., KOSCELNIK, J.**
Choosing Operational Switching Frequency of LCTLC Resonant Inverter
In: *International conference on Innovative Technologies (IN-TECH) 2014*, Portugal, pp. 187- 190, ISSN 1849-0662
- [51] **ŠTEFANEC, P., DOBRUCKÝ, B., JAROŠ, V.**
Impulse Switching Functions of Inverters in MATLAB Environment
In: *Proc. of TCB'14 - Int'l Conf. on Technical Computing*, Bratislava (SK), Nov. 2014, pp. 58, ISBN 978-80-7080-898-6, ISSN 2336-1662
- [52] **JAROŠ, V., DRGOŇA, P., ŠTEFANEC, P.**
Program for Calculating the Coefficients of the Differential Equation Using the Method of Gradual Integration
In: *Proc. of TCB'14 - Int'l Conf. on Technical Computing*, Bratislava (SK), Nov. 2014, pp. 35, ISBN 978-80-7080-898-6, ISSN 2336-1662
- [53] **CUNTALA, J., FRIVALDSKY, M., KONDELOVA, A.**
Simulation of Thermal Effects in Electrolytic Capacitor at Repeated Charge and Discharge Cycles
In: *Proc. of TCB'14 - Int'l Conf. on Technical Computing*, Bratislava (SK), Nov. 2014, pp. 20, ISBN 978-80-7080-898-6, ISSN 2336-1662
GALAD, M., VITTEK, J., SPANIK, P.: *Verification of Observer Algorithms Using Measured Data Files*, In: *International Conference Technical Computing Prague 2013*, 13.11.2013 Prague, pp. 20, Collection of abstracts + Full paper CD-ROM, ISBN 978-80-7080-836-4, ISSN 2336-1662

Reviewed Conference Proceedings in Slovakia

- [54] **MARUSIAKOVA, L., DURDIK, P., JOSKOVA, M., HARGAS, L., BANOVCIN, P.**
Our experience with the diagnostics of primary ciliary dyskinesia
In: *64. Pharmacological days and The 24th Martin Days of Breathing - abstracts*, 2014, ISBN 978-80-89544-70-7 (in Slovak)

- [55] JOSKOVA, M., KONIAR, D., HARGAS, L., HRIANKA, M., DUDRIK, P., BANOVCIN, P., SUTOVSKA, M., PAPPOVA, L., FRANOVA, S.
The Role of Ion Channels in the Regulation of Airway ciliary beat frequency
In: 64. Farmakologické dni a 24. Martinské dni dychania – zborník abstraktov, 2014, ISBN 978-80-89544-70-7
- [56] KONIAR, D., HARGAS, L., HRIANKA, M., SIMONOVA, A., DURDIK, P., JOSKOVA, M., BANOVCIN, P.
Technical Support for Ciliary Apparatus Diagnosis
In: Proceedings of abstracts of the event: Konferencia NITT SK 2014: Technology transfer in Slovakia and abroad, 2014, ISBN 978-8089354-33-7

Industrial Designs

- [57] DRGONA, P., HANKO, B.: The drive system of a vehicle with switched reluctance motor and a double double-clutch gearbox, Ú.V. č. 6706
- [58] DRGONA, P., HANKO, B.: The drive system of the vehicle with 3f synchronous motor and a double double-clutch gearbox, Ú.V. č. 6707
- [59] DRGONA, P., HANKO, B.: The drive system of a vehicle with two 3f motors and modified double gearbox without clutches, Ú.V. č. 6708
- [60] KONIAR, D., HARGAŠ, L., ŠTOFAN, S., HRIANKA, M., ĎURDÍK, P., BANOVCIN, P.: Automatic lighting system of inverted microscope for high-speed cinematography, Ú.V. č. 6811
- [61] FRIVALDSKY, M., DOBRUCKY, B., SPANIK, P.: Bidirectional increasing boost / decreasing buck DC / DC converter with magnetically coupled coils, Ú.V. č. 6862
- [62] PRAZENICA, M., RADVAN, R., KASCAK, S., DOBRUCKY, B., SPANIK, P.: Two-way switch using inverse operation mode of MOSFET transistors, Ú.V. č. 6899
- [63] KASCAK, S., PRAZENICA, M., DOBRUCKÝ, B.: Hardware spatial-vector PWM modulator, Ú.V. č. 6978

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- [64] Dudrik, J., Spanik, P., Trip, N.D.:
Zero-Voltage and Zero-Current Switching Full Bridge DC-DC Converter with Auxiliary Transformer, In: IEEE transaction on POWER ELECTRONICS (a publication of the IEEE power electronics society), September 2006, Vol. 21, No. 5, ITPEE8, pp. 1328-1335.

Citation:

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- [113] **PASKALA, M.:** Utilization of embedded systems in control of slightly dipped systems in mechatronics, PhD thesis, 2014 (in Slovak)
- [114] **VALCO, M.:** Single-phase voltage inverter with regulation of the current value of output voltage for power supply of non-linear loads, PhD thesis, 2014 (in Slovak)
- [115] **CUBON, P.:** Research of optimal energy management in the system with distributed accumulators, PhD thesis, 2014 (in Slovak)

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