

## DEPARTMENT OF MECHATRONICS AND ELECTRONICS

### 1 General Information

The Department of Mechatronics and Electronics has finished the third year of its existence in December, 2007. The year was very successful both in educational and research areas. It can be positively evaluated doctorate PhD study course in which four PhD students have handover their dissertation works and were successful in defense examinations. Works on national and international projects have continued in this year.

The Department has obtained two new projects. The new EU Lifelong Learning Programme project is oriented on technological parks for innovation and trans-european cooperation. The new VEGA (Grant Scientific Agency) project is oriented on research and modeling of thermal fields in power electronic systems.

Process of completion of laboratories has been continued. The Department has obtained completely equipped power electronics laboratory at the cost of 1.7 million crowns from the Power One firm. The other laboratories have been completed by computers, audiovisual and measuring techniques. The firm FreeScale and the firm Fairchild have contributed to laboratories equipment by digital signal processors and samples of semiconductor devices.

In educational areas, the works were dedicated to preparation of new study programs within the frame of complex accreditation of the University of Žilina, in the end of the year.

In the year 2007 the Department involves twelve members of educational staff, five research workers, eight internal PhD students and seventeen external PhD students. From the point of view of internal structure it has been divided into two divisions. The first one is focused on power- and applied electronics. The second one is operating in the field of mechatronics and industry automation.

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 an education has been dedicated for different study branches and specializations in the bachelor-, magisterial- and PhD doctoral studies, both in internal and external ones. Besides, the Department is providing and guarantying study branch of Electro-technical systems in mechatronics in bachelor- and magisterial stage of the study, and specialization of Power semiconductor systems on magisterial stage of the branch of energetic- and electrical engineering (ESI).

The Department also has been 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 analysing of the failures using image analysis. Topology optimising 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. Rather great attention has been devoted to improving of laboratory equipment and modern educational methods, which lead to higher effectiveness of pedagogical process, in the last year. 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	: Branislav Dobrucký
Secretary for Education	: Anna Kondelová
Administrative Support	: Andrea Prandová
Technical Support	: Ján Dávidík

### 2.1 Sections of the Department

#### 2.1.1 Section of Electronics and Control Systems

Head of the Section	: Jozef Čuntala
Professors	: Branislav Dobrucký
Visiting Professors	: Alfio Consoli
Associate Professors	: Pavol Špánik, Jozef Čuntala, Miroslav Hrianka
Research Fellows	: Rastislav Pavlanin, Roman Radvan, Róbert Šul, Michal Kabašta,
Senior Lecturers (without PhD)	: Ivan Kožehuba, Jozef Lakatoš, Peter Šindler, Libor Hargaš, Anna Kondelová

#### 2.1.2 Section of Mechatronics Systems and Industry Automation

Head of the Section	: Fedor Kállay
Associate Professors	: Fedor Kállay, Pavel Pavlásek,
Research Fellows	: Marek Paškala
Senior Lecturers (with PhD)	: Anna Príkopová

#### 2.1.3 Postgraduate Students

Internal (full-time)	: Peter Izák (to 30 <sup>th</sup> September 2007), Dušan Koniar, Slavomír Drozdy (to 30 <sup>th</sup> September 2007), Viktor Bobek, Róbert Šul (to 30 <sup>th</sup> September 2007), Peter Drgoňa, Michal Frivaldský, Peter Fibich (from 1 <sup>st</sup> October 2007)
External (part-time)	: Gabriel Kácsor, Peter Šindler, Anna Kondelová, Marek Paškala, Ivan Lokšeninec, Igor Gerek, Radovan Ovcaričik, Róbert Záhoranský, Branislav Zigmund, Rastislav Pavlanin, Marián Pčola, Roman Filka, Ján Duda, Peter Čerňan, Tibor Digaňa, Jaroslav Šifra, Slavomír Slanina

## 3 Teaching

### 3.1 Courses in Bachelor and Master Degree Programmes

Code	Title	Lessons-Seminars-Exercises	Semester hours/week	Teachers
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*Courses of the Faculty of Electrical Engineering*

32245 Diploma Seminar	6	0- 4-0	Pavlásek
3B303 Analogue Electronic Systems	3	2-0-3	Čuntala
3B309 Electronics I	3	2-0-3	Čuntala
3B327 Distributed Systems in Industry Automation	3	2-0-2	Kállay
3B401 Microprocessor Technology	4	3-0-2	Čuntala
3B402 Digital Electronic Systems	4	2-0-3	Hrianka
3B409 Electronics II	4	2-0-3	Hrianka
3B415 Measurement and Data Processing	4	2-0-2	Kállay
3B416 Power Electronics	4	3-1-2	Špánik
3B421 Electric Light and Heat	4	2-1-1	Pavlásek
3B422 Logical Systems and Microprocessors	4	2-0-2	Hrianka
3B433 Logical Circuits	4	3-0-2	Hrianka
3B501 Design of Electrical Equipments	5	1-1-3	Čuntala
3B503 Electromagnetic Compatibility	5	2-2-0	Špánik
3B513 Logical Circuits	5	3-0-2	Hrianka
3B520 Mechatronics	5	2-0-2	Pavlásek
3B522 Automatic Regulation	5	2-2-0	Príkopová
3B530 Automatic Control	5	2-0-1	Pavlásek
3B531 Multimedia Technology	5	2-0-1	Pavlásek
3B532 Computer and Office Technique	5	2-0-1	Pavlásek
3B612 Image Processing and Analysis	5	2-0-2	Hrianka
31618 Microelectronics	6	3-0-2	Čuntala
31020 Image Processing and Analysis	6	2-0-2	Hrianka
31260 Power Static Converters	6	4-1-2	Špánik
31261 Microcontroller Control Systems	6	2-0-2	Dobrucký
31298 Analysis and Synthesis of Power El.Circuits	6	2-0-2	Špánik
31303 Distributed Systems in Industry Automation	6	2-0-2	Kállay
31106 Design of Customer IC	7	1-3-0	Čuntala
31272 Advanced Control Systems	7	2-0-2	Dobrucký
31035 Microcomputers Programming	8	0-2-2	Šindler
31282 Power Semiconductor Systems	8	2-1-1	Dobrucký
31304 Electric Drives for Robotic Systems	8	2-0-2	Dobrucký
31290 Discrete Control of Electric Drives	9	2-1-2	Dobrucký
31295 Real Time Computer Control	9	2-0-2	Dobrucký
31302 Power Electronics Applications in ET & EE	9	3-0-1	Dobrucký
31260 Diploma Seminar	10	0-8-0	Špánik

*External Study*

3B409 Electronics II	4	14-0-4	Hrianka
3B433 Logical Circuits	5	14-0-4	Hrianka
3B522 Automatic Regulation	5	2-2-0	Príkopová

*Courses of the Faculty of Mechanical Engineering*

21416 Electronics	6	2-0-1	Čuntala
21927 Computers at Industry Automation	6	2-0-2	Kállay
21045 Measurement and Diagnostic	7	2-0-2	Paškala
21046 Logical Circuits	7	2-0-2	Hrianka
21047 Theory of Automatic Control I	7	2-0-2	Príkopová
21455 Exploitation of Computer Network	7	2-0-2	Kállay
21072 Microcomputer Technics	8	2-0-2	Čuntala
21074 Sensors of Non-electrical Phenomena	8	2-0-2	Kállay

21075 Technologies of Process Control	8	2-0-2	Príkopová
21073 Information and Industry Networks	8	2-0-2	Kállay
21910 Electronic Control Elements	8	2-1-2	Špánik
21560 Theory of Automatic Control II	8	2-0-1	Príkopová
21217 Semester project	9	0-0-2	Kállay
21682 Mechatronic systems	9	2-0-2	Pavlásek
21735 Dispatching Systems	9	2-0-2	Kállay
21218 Systems Theory	10	2-2-0	Príkopová
21287 Application of Automation Technics	10	2-0-2	Kállay
21289 Diploma seminar	10	0-0-6	Kállay

#### *Courses for Foreign Students – Socrates/Erasmus Program*

3B530 Automatic Control	Pavlásek	student of Universidade do Porto, PT
3B421 Electric Light and Heat	Pavlásek	student of Universidade do Porto, PT

## **4 Educational, Research and Scientific Projects**

### **4.1 Research Projects Funded by the Grant Agencies of the Slovak Republic**

*Title: Progressive Methods of Digital Processing of Nondeterministic Image Signals and Bio-signals (VEGA 1/3107/06)*

Coordinator: Miroslav Hrianka

Co-operators: Libor Hargaš, Peter Izák, Dušan Koniar

*Title: Research of the new methods of modeling-, control and simulation of mechatronic systems (VEGA 1/3086/06)*

Coordinator: Branislav Dobrucký

Co-operators: Fedor Kállay, Pavel Pavlásek, Valéria Hrabovcová, Pavol Rafajdus, Pavol Špánik, Branislav Zigmund, Róbert Šul, Rastislav Pavlanin, Anna Kondelová, Anna Príkopová, Peter Šindler

*Title: Research of commutation process in power transistor structures at soft switching techniques and control algorithm optimization (VEGA 1/3123/06)*

Coordinator: Pavol Špánik

Co-operators: Peter Bury, Branislav Dobrucký, Fedor Kállay, Jozef Čuntala, Miroslav Hrianka, Pavel Pavlásek, Anna Príkopová, Ivan Turek, Peter Šindler, Anna Kondelová, Roman Radvan, Marek Paškala, Rastislav Pavlanin, Viktor Bobek, Róbert Šul, Michal Frivaldský, Slavomír Drozdy, Peter Drgoňa

*Title: Theoretical apparatus for implementation of e-SAFETY principles to Intelligent Transport Systems (VEGA 1/1044/04)*

Coordinator: Juraj Spalek

Co-operators: Fedor Kállay, Anna Príkopová

*Title: Device with internal intelligence for gigacycle fatigue test of construction materials working ultrasonic frequency area (APVV-20-051705)*

Coordinator: Pavol Špánik

Co-operators: Branislav Dobrucký, Peter Palček, Fedor Kállay, Jozef Čuntala, Miroslav Hrianka, Pavel Pavlásek, Rastislav Pavlanin, Róbert Šul, Branislav Zigmund, Slavomír Drozdy, Peter Izák, Libor Hargaš, Jozef Lakatoš, Ivan Kožehuba, Peter Šindler, Anna Príkopová, Otakar Bokúvka, Eva Tillová, František Nový, Marián Činčala, Jozef Kúdelčík, Helena Šamajová, Michal Frivaldský, Marek Paškala, Peter Drgoňa, Viktor Bobek, Ján Davidík

*Title: Popularisation of university study in electronics, mechatronics and IT on secondary schools (APVV LPP -0237-06)*

Coordinator: Pavol Špánik

Co-operators: Branislav Dobrucký, Róbert Šul, Marek Paškala, Miroslav Hrianka, Fedor Kállay, Pavel Pavlásek, Anna Heglasová, Marián Prievozník, Pavol Bagin, Jozef Čuntala

#### 4.2 International Projects

*Title: Teachers and students mobilities within the frame of Socrates/Erasmus programmes*

Coordinator: Marián DZIMKO

Co-operators: Branislav Dobrucký (TU Darmstadt, DE), Pavol Špánik (UNICT Catania, IT), Miroslav Hrianka (UCD-NUI Dublin, IRL), Diana Costa (Universidade do Porto, PT), Vitor Torres (Universidade do Porto, PT)

*Title: Marie Curie Early Stage Training: Electric Energy Conversion and Conditioning ECON2 – 6FP of EU (MEST-CT-2004-504243)*

Coordinator: Greg ASHER – University of Nottingham

University sub-coordinator: Branislav Dobrucký

Co-operators: Ivan Giannelli, Ján Vittek, Michal Kabašta, Viktor Bobek

#### 4.3 Internal Research Projects

*Title: Sophistic-, electronic and mechatronic systems (9/606)*

Coordinator: Pavol ŠPÁNIK

Co-operators: Branislav Dobrucký, Pavel Pavlásek, Fedor Kállay, Anna Príkopová, Daniel Korenčiak, Robert Šul, Slavomír Drozdy, Branislav Zigmund, Viktor Bobek, Michal Frivaldský, Peter Drgoňa, Rastislav Pavlanin, Marek Paškala, Roman Radvan

*Title: Simulation and analysis of HMI interfaces (10/606)*

Coordinator: Miroslav HRIANKA

Co-operators: Jozef Čuntala, Anna Kondelová, Ivan Kožehuba, Peter Šindler, Jozef Lakatoš, Libor Hargaš, Tibor Digaňa, Peter Izák, Dušan Koniar

#### 4.4 Other Projects

*Title: TOP – eL (11230100314)*

Coordinator: Matilda Drozdová

Co-operator: Miroslav Hriamka

## 5 Co-operation

### 5.1 Co-operation Partners in Slovakia

EVPÚ a.s Nová Dubnica  
ABB Slovakia, Bratislava  
DataTherm, s.r.o. Žilina  
Power-One, Dubnica nad Váhom  
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  
Energoc controls s.r.o. Žilina  
ControlTech, s.r.o. Trnava  
Schneider Electric Slovakia, s.r.o., Bratislava, Žilina  
VA TECH ELIN EBG SR, s.r.o., Žilina, Bratislava  
ELTECO, a.s. Žilina  
VUVT Engineering, a.s. Žilina  
ELBATEX Slovakia, s.r.o.  
MACRO, s.r.o., Žilina  
SSE, a.s. Žilina  
EMERSON a.s. Nové Mesto n. Váhom  
Súkromná zväračská 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  
LJF Martin, UK 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  
Siemens s.r.o., Bratislava

### 5.2 International Co-operation Partners

Università degli studi di Catania -IT, DIEES, prof. Alfio Consoli  
Politecnico di Bari – IT, DEE, prof. Francesco Cupertino  
Technische Universität Graz - AT, FE, IEL, Dr. Manfred Sakulin  
University of Nottingham - UK, prof. Greg ASHER, prof. Pat Wheeler  
University of Picardie – Jules Verne, Amiens - FR, prof. Gérard-André Capolino  
National University of Ireland, Dublin – IRL, prof. Annroi de Paor  
Freescale (Motorola) – CZ, Ing. Ivan Skalka  
University of Porto – PT, prof. Maciel Barbosa  
Technische universität Dresden – DE, Dr. Peter Büchner  
Technische universität Darmstadt – DE, prof. Andreas Binder  
Technikum Wien – AT, prof. Felix Himmelstoss  
Technische universität Bochum – DE, prof. Andreas Steimel  
National Instruments Czech Republic, s.r.o. – Ing. Roman Vala  
Technical Univesity RWTH Aachen - DE  
XILINX USA, University program

Laboratory Imaging, s.r.o. Praha  
 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  
 B&R Automatizace, Brno – CZ  
 Rockwell Automotion s.r.o., Praha - CZ

### 5.3 Visits to Foreign Institutions

<i>Name</i>	<i>Institution</i>	<i>Length of stay</i>
Miroslav Hrianka	UCD – NUI Dublin, IRL	7 days
Pavel Pavlásek	EC DG for Research, Brussels, Belgium	8 days
Pavol Špánik	UNICT Catania, IT	7 days
Branislav Dobrucký	TU Darmstadt, DE	7 days
Branislav Dobrucký	TU Darmstadt, DE	4 days
Branislav Zigmund	EU-Japan Centre for Industrial Coop., JP	1 year / 8 months
Viktor Bobek	University College, Cork, IRL	6 months

### 5.4 Visitors from Foreign Institutions

<i>Name</i>	<i>Institution</i>	<i>Length of stay</i>
Annraoi de Paor	UCD – NUI Dublin, IRL	3 days
Elzbieta Szycha	Univerzity of Radom, Poland	3 days
Mahmud Rzig Abdalmoula	Ministry of Education, Libya	1 week
Miroslav Luft	Univerzity of Radom, Poland	3 days
Zbygniew Lukasik	Univerzity of Radom, Poland	3 days
Miho Nishiguchi	Panasonic, Japan	1 day
Nobuharu Katsuki	Panasonic, Japan	1 day
Yoshikazu Suehiro	Panasonic, Japan	1 day
Norbert Glapa	Panasonic, Germany	1 day
C. Tisha Shokat	Power One, USA	1 day
Alex Levran	Power One, USA	1 day
Stefan Naudé	Power One, USA	1 day
Rolf Baldauf	Power One, Switzerland	1 day

## 6 Other Activities

### 6.1 Specialized Lectures, Courses Organized by the Department

*Title of Lecture/Course:* AVR Processors

*Customer:* Secondary school teachers

*Lecturer:* Branislav Dobrucký, Viktor Bobek, Peter Drgoňa

*Date:* January – February 2007

*Title of Lecture/Course:* University Studies in Electronics

*Customer:* Secondary school teachers

*Lecturer:* Pavol Špánik, Milan Trunkvalter, Miroslava Konrádová, D. Pudiš, M. Dočár

*Date:* 4<sup>th</sup> December 2007

*Title of Lecture/Course: Thermal Design of Power Semiconductor Devices*

Customer: Power One, Nová Dubnica  
 Lecturer: Pavol Špánik, Dušan Pudiš, Jozef Lakatoš  
 Date: 12<sup>th</sup> July 2007

*Title of Lecture/Course: Design and Construction of Electromagnetic Components for Higher Frequencies*

Customer: Power One, Nová Dubnica  
 Lecturer: Pavol Špánik, Dušan Pudiš, Bernard Bednárík  
 Date: 13<sup>th</sup> July 2007

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

Customer: GS1 SLOVAKIA  
 Lecturer: Pavel Pavlásek  
 Date: 3<sup>rd</sup> May 2007

## 6.2 Solicited Lectures

*Title of Lecture: (Towards) Highest Dynamics of Single-Phase Power Electronic Systems Using 'Virtual Approach'*

Lecturer: Branislav Dobrucký  
 Where/When: 16<sup>th</sup> Int. Conf. EDPE'07, The High Tatras, Slovakia / 24<sup>th</sup> – 26<sup>th</sup> September 2007

## 6.3 Membership in International Institutions/Committees

Branislav Dobrucký	-Member of International Association for Science and Technological Development (IASTED), CA -Reviewer for Publishing Company Elsevier, NL -Steering Programme Committee of International EDPE 2007 Conf. -Steering Programme Committee of International MIC 2007-2008 Conf. -Steering Programme Committee of International EuroPES 2007 Conf.
Pavel Pavlásek	-Member of the Editorial Board of the Strojárstvo (Machinery) Journal -Member of Brandon Hall Excellence in Learning Awards -Expert of FP7 Programme NMP – 2007 – 3.4 - 1
Pavol Špánik	-Member of IEEE Society
Róbert Šul	-Student member of IEEE Society
Michal Frivaldský	-Student member of IEEE Society

## 6.4 Membership in National Institutions/Committees

Branislav Dobrucký	-Member of Working Group No. 1 for Technical Science of Slovak Research and Development Agency -Member of the National Program Council, Guarantee of the complex young workers up to 35 alter personality development in R&D -Member of the Common Committee for Electrical Engineering -Steering Programme Committee of ALER 2007 Conf. -Steering Programme Committee of TRANSCOM 2007 Conf.
Pavel Pavlásek	-Head of the Commission of Transport and Road Administration port (The Žilina Self-governing region) -Member of the Grant Commission for Education and Culture No.2 of the Ministry of Education of Slovak Republic



- 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 Common Committee for Mechatronics

## 6.5 Membership in University Boards

- Branislav Dobrucký -Member of the Editorial Board of ZU Scientific Journal – Communication – Scientific Letters
- Editorial Board of Publication Committee of ZU
- 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 ZU
- Member of the Scientific Board of FEE ZU
- Member of the Electrical Engineering Committee, FEI STU Bratislava
- Member of the Automation and Control Committee – Process Control, FEE ZU
- Member of the Measurement Technique Committee, FEI TU Košice
- Miroslav Hrianka -Member of the Scientific Boards of FEE ZU
- Libor Hargaš -Member of the Academic Senate of FEE ZU

## 7 Publications

### 7.1 Book Publications

#### Monographs

- [1] FRANEKOVÁ, M. – KÁLLAY, F. – PENIAK, P. – VESTENICKÝ, P.: Communication Safety of Industrial Networks (in Slovak), University of Žilina in EDIS – Publisher ŽU 2007, August, 2007, 2421<sup>th</sup> publication, 272 pages, 250 copies, ISBN: 978-80-8070-715-6.

#### Lecture Notes and Textbooks

- [2] PAVLÁSEK, P.: Didactics of specific subjects (Expanded Notes of Lectures for Students of DPS) (in Slovak), University of Žilina in EDIS – Publisher of ZU 2007, 2442<sup>th</sup> publication, 130 copies, 38 pages.

### 7.2 Journals (SK)

#### Non-current Content Foreign Journals

- [3] HARGAŠ, L. – KONIAR, D. – HRIANKA, M.: Tissue Analysis by Virtual Instrumentation, In: Sensor & Transducers Journal, IFSA, Vol. 75, Issue 1, January 2007, pp. 914-919.
- [4] IZÁK, P. – SMETANA, M. - HRIANKA, M.: 3D Reconstruction of NMR Images by LabVIEW, In: Sensor & Transducers Journal, IFSA, Vol. 75, Issue 1, January 2007, pp. 920-925.
- [5] PIRNÍK, R. – KMEŤ, V. – CIGÁNEK, P. – KÁLLAY, F.: Monitoring of Dangerous Loads Using RFID (in Slovak), In: Logistika, 7/8 2007, pp. 36-37.
- [6] ŠPÁNIK, P - DOBRUCKÝ, B. – FRÍVALDSKÝ, M.- DRGOŇA, P.: Experimental Analysis of Commutation Process of Power Semiconductor Transistor Structures. Acta Technica CSAV, Vol. 52, No. 4., 2007, ISSN 0001-7043,
- [7] ŠPÁNIK, P.- ČUNTALA, J.- LAKATOŠ, J.- KONDELOVÁ, A.- FRÍVALDSKÝ, M.: Analysis of Field of Temperature of Power Electronic Systems in COMSOL

- MULTIPHYSICS Environment, In: ElectroScope – On Line Magazine, ISSN 1802-4564 (in print).
- [8] M. FRANEKOVÁ – F.KÁLLAY – P.VESTENICKÝ,- P.ŠPÁNIK: Trends in Evaluation of Functional Safety of Industry Nets (in Russian), In: Vestnik MIITa, January 2008 (in print).
- [9] KÁCSOR, G. - ŠPÁNIK, P – DUDRÍK, J. – LUFT, M. - SZYCHTA E.: Principles of Operation of Three – Level Shift Controlled Converter, In: Magazine of Electronics & Electrical Engineering, LITVA, Kaunas, (in print).
- [10] FRANEKOVÁ, M. – KÁLLAY, F. – KURYTNIK, P.: Safety Analyse of Cryptography Protocol Used Within Safety-Related Control Systems in Industry, In: Wymirjuwalna technika ta metrologija, Ukraina, December 2007 (in print).
- [11] DOBRUCKÝ, B. – ŠPÁNIK, P. – POKORNÝ, M.: Dynamic Single-Phase DVR System with Instantaneous Power Factor Estimator, In: International review of electrical engineering (IREE), December 2007 (in print).

### Journals (SK)

- [12] FILKA, R. – BALAŽOVIČ, P. – DOBRUCKÝ, B.: A Sensorless PM Synchronous Motor Drive for Electric Washers, Komunikácie, Scientific letters of the University of Žilina, 1/2007, pp. 24-32.
- [13] KÁLLAY, F. – PENIAK, P.: The Communication in Mechatronic Systems, Komunikácie, Scientific letters of the University of Žilina, 1/2007, pp. 43-46.
- [14] PAVLÁSEK, P.: e-Mechatronics: Digital Content in Transformation of Teaching and Learning, Komunikácie, Scientific letters of the University of Žilina, 1/2007, pp. 52-59.
- [15] IZÁK, P. - SMETANA, M. – HARGAŠ, L. – HRIANKA, M. – ŠPÁNIK, P.: 3D Reconstruction of NMR images, In: Advances in Electrical and Electronic Engineering (AEEE), No. 1, Vol. 6/2007, Slovakia, pp. 12-15.
- [16] ŠPÁNIK, P. – DOBRUCKÝ, B. – FRIVALDSKÝ, M. – DRGOŇA, P. – LOKŠENINEC, I.: Experimental Analysis of Commutation Process of Power Semiconductor Transistor's Structures, In: Advances in Electrical and Electronic Engineering (AEEE), No. 1, Vol. 6/2007, Slovakia, pp. 12-15.
- [17] ŠPÁNIK, P. – ŠUL, R. – DUDRÍK, J.: New Materials Based on SiC technology in Power Electronic systems (in Slovak), In: Strojárstvo, 5/2007, pp. 150-151.
- [18] KONIAR, D. – HARGAŠ, L. – BELÁNIK, M. – HRIANKA, M.: Analysis of Kinetics of Respiratory Epithelium Using Virtual Instrumentation (in Slovak), In: AT&P Journal plus, MMaMS 2007, CD, Slovakia, pp. 308 – 313.
- [19] PRIKOPOVÁ, A. – PALKOVÁ, Z.: New Trends of Effective control, In: Acta technologica agriculturae, (in print).
- [20] PALKOVÁ, Z. – BYSTRIANSKY, P. – PRÍKOPOVÁ, A.: Simulation Model of Irrigational Process Using Bulk Service Theory (in Slovak), In: Acta technologica agriculturae, (in print).
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