UNIVERSITY OF ŽILINA

ACERT
ISO 9001

**FACULTY OF ELECTRICAL
ENGINEERING**

ANNUAL REPORT

2011

Žilina, March 2012

DEPARTMENT OF CONTROL AND INFORMATION SYSTEMS

1   General Information

The Department of Control and Information Systems (further referred to as the DCIS) guarantees the study branch Automation – study programme Automation in bachelor degree, study branch Automation – study programme Process Control Engineering in MSc. degree and study branch Automation – study program Process Control Engineering in PhD. degree at the Faculty of Electrical Engineering of the University of Žilina.

Research activities of the DCIS are directed at the sphere of information and safety-related system analysis and synthesis ranging from solution of theoretical models to practical projects of operation including implementation. There are many sectors of activities in which the DCIS has an exclusive position in the Slovak Republic, especially in expertise processing in the field of analysis and synthesis of railway interlocking systems.

The sphere of reliable and safe information transmission and processing in control of selected critical processes both in safety-related systems for all kinds of transport, complex technologies and in security systems for protection of humans and property provides dynamic incentive for all the staff. Realization of information services for operative control supported by automation and computer technology is applicable in decisive branches of the national economy.

Activities performed at the DCIS are integrated to the national and international co-operation with academic and industry sphere and realized through various forms - from research projects to exchanges of students and experts.
In 2011 the staff of the DCIS consisted of 16 pedagogical workers, 2 technicians and administrative support, 2 researchers and 13 full-time postgraduate students. The pedagogical staff consisted of 4 professors, 1 guest professor, 2 associate professors, 6 senior lecturers with an academic degree PhD, 3 senior lecturers without this degree.

2   Staff of the Department

Head of the Department: Juraj Spalek
Vice-head of the Department: Aleš Janota
Department secretary: Rastislav Pirník
Study Consultant: Peter Nagy
Administrative Support: Klára Berešíková
Technical Support: Kamila Kršíková
Researchers: Martin Čapka, Rastislav Pirník

2.1   Sections of the Department

2.1.1   Section of Automation and Signalling Systems

Head of the Section: Karol Rástočný
Professors: Aleš Janota, Karol Rástočný, Juraj Spalek
Guest Professor: Pavel Přibyl
Senior Lecturers (with PhD):   Jozef Hrbček, Vojtech Šimák, Juraj Ždánsky
Senior Lecturers (without PhD): Peter Nagy

2.1.2   Section of Communication and Information Systems

Head of the Section: Mária Franeková
Professors: Mária Franeková

Associate Professors: Václav Končelík, Ľudmila Muzikářová
Senior Lecturers (with PhD): Tatiana Brončeková, Peter Vestenický; Peter Peniak
Senior Lecturers (without PhD): Emília Bubeníková, Peter Holečko

2.1.3 Postgraduate Students

Internal (full-time): Michal Gregor; Tomáš Mikluščák; Ľubomír Pekár; Ján Halgaš; Peter Matis; Zuzana LobotkováJuraj Ilavský; Marek Výrostko; Juraj Ľupták; Tibor Moravčík; Tomáš Ondrašina; Ján Capák

External (part-time): Peter Holečko; Peter Chrtiansky; Pavol Mrmus; Milan Slivka; Ján Slezák; Peter Nagy; Emília Bubeníková; Anna Cerovská; Peter Lüley

3 Teaching

3.1 Courses in Bachelor and Master Degree Programmes

3.1.1 Bachelor Degree Programmes

Code Title	Semester	Lessons-Seminars-Exercises hours/week	Teachers
Courses at the Faculty of Electrical Engineering			
31100 Algorithmisation of problems	1	2-2-0	Brončeková Čapka
31209 Programming languages 1	1	2-2-0	Brončeková
31202 Information communication networks	2	1-0-2	Pirník
31204 Computing technical environment	2	1-0-2	Vestenický
31425 Logical systems	4	3-1-1	Ždánsky
31437 Control systems	4	2-1-2	Spalek
31443 Theory of automated control 1	4	3-1-1	Hrbček Bubeníková
31444 Theory of signals and systems	4	3-1-1	Muzikářová Bubeníková
31534 Single-chip controllers programming	5	2-0-2	Končelík
31504 Bachelor project	5	0-0-5	Franeková Muzikářová Vestenický Ždánsky
31521 Communication security	5	3-1-1	Franeková
31536 Sensor technology	5	3-1-1	Janota
31541 Control systems reliability and safety	5	3-2-0	Rástočný
31600 Bachelor work	6	0-2-0	Franeková Muzikářová Vestenický Ždánsky
31606 Distributed control systems	6	3-1-1	Franeková Vestenický
31612 Information systems	6	3-1-1	Nagy
31623 Control systems programming	6	1-0-2	Ždánsky
Courses at the Faculty of Civil Engineering			
92347 Applied electronics	2	2-0-2	Nagy
92347 Applied electronics (External Study)	2	18-0-0	Nagy

3.1.2   Master Degree Programmes

Code Title	Semester	Lessons-Seminars-Exercises hours/week	Teachers

Courses at the Faculty of Electrical Engineering

Code	Title	Semester	hours/week	Teachers
32101	Control systems safety analyses	1	3-2-0	Rástočný
32103	Information systems security	1	3-1-1	Holečko Peniak
32120	Computer networks	1	3-1-1	Vestenický
32124	Safety systems components	1	3-1-1	Nagy
32130	Theory of automated control 2	1	3-1-1	Hrbček
32142	Signal processing appliances	1	3-1-1	Muzikářová
32202	Higher programming languages applications	2	2-1-2	Holečko
32203	Secure system communication	2	3-1-1	Franeková
32214	Information systems in medicine	2	2-0-2	Brončeková
32221	Object-oriented system development	2	2-0-2	Rástočný Janota
32225	Signal processing appliances	2	3-1-1	Muzikářová
32238	Artificial intelligence	2	2-0-2	Spalek
32243	Safety systems	2	3-1-1	Rástočný
32301	Safety systems applications	3	3-0-2	Nagy
32302	Safety systems	3	3-0-2	Nagy
32311	Expert systems	3	3-0-2	Janota
32312	Fuzzy control	3	3-1-1	Spalek
32316	Master project	3	0-0-5	Končelík Muzikářová Spalek
32342	Processes visualisation	3	3-1-1	Ždánsky
32400	Information systems applications	4	3-0-2	Peniak Vestenický
32401	Wireless communication	4	3-1-1	Vestenický
32402	Diploma work	4	0-0-0	head of DW.
32403	Diploma project	4	0-0-10	head of DW.
32411	Intelligent transportation systems	4	3-2-0	Spalek Janota, Přibyl
32417	Artificial intelligence programming	4	3-2-0	Janota

Courses at the Faculty of Civil Engineering

Code	Title	Semester	hours/week	Teachers
96417	Communication and safety technologies	2	2-1-0	Nagy

Courses at the Faculty of Operation and Economics of Transport and Communications

Code	Title	Semester	hours/week	Teachers
13P102	Information systems in transport	1	2-2-1	Čapka

4   Educational, Research and Scientific Projects

4.1   National Projects

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

VV_VEGA – 1/0392/10 Research of mobile nodes localisation in wireless sensor networks
Coordinator: Peter Brída (DTaM)
Co-operators: Peter Vestenický

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

APVV VMSP-P-0142-09 "Development, research and implementation of supplemental road signalling for safety on railway crossings and cross walks" in cooperation with ARDOS AZ, Inc. (2009 – 2011)
Coordinators: Juraj Spalek (for UoŽ),
Co-operators: Aleš Janota; Rastislav Pirník; Peter Nagy; Peter Matis

APVV SK-PL-0015-09 Safety appraisal of railway safety systems
Coordinators: Karol Rástočný
Co-operators: Mária Franeková, Peter Nagy

4.1.3   Other National Projects – European social fund project ITMS

Flexible and attractive study on the University of Žilina for the needs of labour market and knowledge society
Coordinator: Ivo Čáp
Co-operators: Tatiana Brončeková

Systemisation of advanced technologies and knowledge transfer between industrial sphere and university environment ITMS 26110230004
Co-operators: Emília Bubeníková

Centre of excellence for intelligent transport systems and services I. European structural fund project and Ministry of Education of SR – ITMS project code: 26220120028
Coordinator: Karol Matiaško (FoCI)
Activity 1.1:   Juraj Spalek (Coordinator), Mária Franeková, Peter Vestenický, Martin Čapka, Rastislav Pirník, Vojtech Šimák
Activity 1.2:   Karol Rástočný, Rastislav Pirník
Activity 1.3:   Aleš Janota, Jozef Hrbček

Centre of excellence for intelligent transport systems and services II. European structural fund project and Ministry of Education of SR – ITMS project code: 26220120050
Coordinator: Karol Matiaško (FoCI)
Activity 1.1:   Juraj Spalek (Coordinator), Mária Franeková, Peter Vestenický, Martin Čapka, Rastislav Pirník, Vojtech Šimák
Activity 1.2:   Karol Rástočný, Rastislav Pirník
Activity 1.3:   Aleš Janota, Jozef Hrbček

New measurement methods for physical dynamical parameters and interactions of traffic stream motor vehicles and roadway – project code: 26220220089, 2010-2014
Coordinator: Aleš Janota
Co-operators: Juraj Spalek, Mária Franeková, Peter Vestenický, Martin Čapka, Rastislav Pirník, Jozef Hrbček, Vojtech Šimák, Tatiana Bročeková, Peter Holečko, Ľudmila Muzikářová, Emília Bubeníková, Kamila Kršíková, Klára Berešíková

Development of modular robotic systems - VMROS – ITMS project code: 26220220049, 2010-2011
Coordinator: Milan Gregor (FoCE)
Co-operators: Juraj Spalek, Aleš Janota

Intelligent modular system for components quality control - InMoSysQC - ITMS project code: 26220220009, 2007-2013
Coordinator: Branislav Mičieta (FoCE), Milan Gregor (FoCE)
Co-operators: Mária Franeková, Aleš Janota, Juraj Spalek.

Competence centre for research and development in the area of diagnostics and therapy of oncologic diseases, ITMS code: 26220220153
Recipient: Comenius University in Bratislava/ Jessenius medicine faculty in Martin
Coordinator for UoŽ: Ján Michalík
Coordinator of Activity 2.3:   Róbert Hudec (KTaM)
Project manager for UoŽ: Martin Čapka
Co-operators: Róbert Hudec, Miroslav Benčo, Martin Brezňan, Branko Babušiak, Ján Barabáš, Michal Gála, Roman Radil

Centre for translational medicine - ITMS project code: 26220220021:
Recipient: Comenius University in Bratislava
Project partner: University of Žilina
Co-operators: Mária Franeková

4.1.4   Other International Projects

Safety appraisal of track safety device EAH-08 (Cooperation agreement on research activity Nr. 1/2010 between SignalBau Přerov and University of Žilina)
Coordinator: Karol Rástočný
Co-operators: Peter Nagy, Juraj Ždánsky, Juraj Ilavský

A-0930-RT-GC Helicopter fuselage crack monitoring and prognosis through on-board sensor (HECTOR), European Defence Agency
Coordinator: Róbert Hudec (KTaM)
Co-operators Peter Vestenický – leader of Work Package 4.2 and member of co-operator collective

5   Co-operation

5.1   Co-operation Partners in Slovakia

- ADAC – Allgemeiner Deutscher Automobil – Club e. V, Germany
- ADOTEL-HEX Ltd., Automatizácia dopravy a telekomunikácií (Transportation and telecommunications automation), Žilina
- ANDIS Ltd., Analógové a digitálne systémy (Analog and digital systems), Bratislava
- ARDOS AZ Inc., Bratislava

- B+R automatizace, Ltd. – organisation section, Nové Mesto nad Váhom
- Betamont Ltd., Zvolen
- CONTAL. Ltd., Žilina
- ELISS, Ltd., Žilina
- ESA Solution Ltd., Žilina
- Faculty of Electrical Engineering and Information Technology, Slovak Technical University, Bratislava
- Faculty of Electrical Engineering and Information Technology, Technical University, Košice
- Faculty of Mechanical Engineering, Technical University, Košice
- HELDIS Ltd., Ružomberok
- National highway company (Národná diaľničná spoločnosť a. s.), Bratislava
- Siemens PSE Bratislava
- Siemens Rail Automation Engineering, Žilina
- Scheidt&Bachmann Slovensko Ltd., Žilina
- Skytoll Inc., Bratislava
- SOMI Systems Inc., Banská Bystrica
- Slovak Standards Institute, Bratislava
- Technical university Košice
- Transportation research institute, Žilina
- Intelligent transportation systems association (Združenie Inteligentné dopravné systémy Slovensko), Bratislava
- Želsys Inc., Bratislava
- ŽSR (Slovak Railways), Bratislava

5.2   International Co-operation Partners

- ADAC – Allgemeiner Deutscher Automobil – Club e. V, Germany
- AŽD Praha Ltd., Prague, CR
- DE BUELE Technics, Hamme, Belgium
- ELTODO EG, Prague, CR
- Faculty of Transportation, Czech Technical University, Prague, CR
- HTE – Scientific Association for Infocommunications, Budapest, Hungary
- První Signální Inc., Ostrava, CR
- Transport telematics association (SDT – Sdružení pro dopravní telematiku), Prague, CR
- Scheidt&Bachmann, Mönchengladbach, Germany
- SIEMENS AG, Transportation Systems, Vienna, Austria
- Siemens Ltd. – Building Technology, Bratislava
- Signalbau Inc., Přerov, CR
- Thales Rail Signalling Solutions GmbH, Vienna, Austria

5.3   Visitors to the Department

Name	Institution	Length of stay
Białoň Andrzej	Centrum naukovo-techniczne kolejnictwa, Warszawa, PL	7 days
Braband Jens	Siemens AG, Braunschweig, Germany	1 day
Faltus Vladimír	FT TU Prague, CR	2 days
Kunhart Milan	AŽD Praha, CR	5 days
Mikulski Jerzy	Politechnika Ślaska, Wydzial Transportu, Katowice, Poland	11 days
Mlynczak Jakub	Politechnika Ślaska, Wydzial Transportu, Katowice, Poland	7 days
Tarnai Géza	TU Budapest, Hungary	1 day
Zářecký Stanislav	První Signální, Ostrava, CR	2 days
Žilka Jiří	První Signální, Ostrava, CR	2 days

5.4   Visits to Foreign Institutions

Name	Institution	Length of stay
Čapka Martin	Conference & Exhibition Intelligent Cities Expo, Hamburg, G	
Franeková Mária	Silesian University of Technology, Faculty of Transport, Katowice, Poland	3 days
	Faculty of Transportation, Czech Technical University, Prague, CR	2 days
Janota Aleš	Politechnika Sliezska Katowice-Ustroń, Poland	3 days
	Faculty of Transportation, Czech Technical University, Prague, CR	1 day
	Eltodo Prague, CR	2 days
	DC TUD-COST, Warszaw, Poland	2 days
	TU Braunschweig	2 days
	DC TUD-COST, Vienna, Austria	3 days
	DC TUD-COST, Ohrid, Macedonia	3 days
	Conference & Exhibition Intelligent Cities Expo, Hamburg, D	4 days
	Politechnika Radomska, Radom, Poland	1 day
Nagy Peter	Operational control centre Czech Railways, Přerov, CR	1 day
	Thales Vienna, Austria	1 day
Pirník Rastislav	Intertraffic 2011 – conference and exhibition, Istanbul, Turkey	4 days
	Katowice-TST 2011 – conference, Ustroń, Poland	3 days
	Conference & Exhibition Intelligent Cities Expo, Hamburg, D	4 days
Rástočný Karol	TU Katovice (Ustroň), Poland	4 days
	AŽD Prague (Pardubice), CR	6 days
	TU Budapest, Hungary	3 days
	TU Katovice, Poland	3 days
	Thales Vienna, Austria	1 day
Spalek Juraj	Workshop Developing European Transport Research Alliance, Prague CR	1 day
	Conference & Exhibition Intelligent Cities Expo, Hamburg, D	4 days
	Eltodo EG, Inc., FT Technical university Prague	2 days

5.5   Contracts (Business Activities)

Contract number: *466/*2011
Contract name*:*   Technical normalization plan 2010: Railway applications. Communication and signaling systems and data processing systems. Communication related to security in transmission systems. Adoption of EN in English into STN - translation.
Customer: SÚTN, Bratislava
Coordinator: Mária Franeková

Contract number: P-103-0012/11
Contract name*:*   Extension of existing overall appraisal for electronic interlocking boxes in Slovakia (corrections of V44K100309R351 version of migration phase)
Customer: SIEMENS AG, Östereich, I MO RA ML SEE, Siemensstr. 90, 1211 Vienna, Austria
Project duration: 2011
Coordinator: Karol Rástočný

Contract number: P-103-0019/10
Contract name*:*   Methodics for functional behaviour creation of RBCC
Customer: AŽD Praha, Ltd., Technology - Research and development, Žirovnická
                      2/3146, 106 17 Prague 10,
Project duration: 2010-2011
Coordinator: Karol Rástočný

Contract number: P-103-0006/11
Contract name: Appraisal of creation process of functional behaviour model of RBCC –
                      analytic part
Customer: AŽD Praha, Ltd., Technology - Research and development, Žirovnická
                      2/3146, 106 17 Prague 10
Project duration: 2011
Coordinator: Karol Rástočný

Contract number: 350/2/2011
Contract name   Analysis of methodical and technical conditions (TP) and design of new
                      TP relevant with the NSDI project.
Customer: Transportation research institute Inc. (Výskumný ústav dopravný),
                      Žilina
Coordinator: Rastislav Pirník
Co-operators: Juraj Spalek, Aleš Janota, Pavel Přibyl

Contract number: P-103-0003/11
Contract name: Educational training for KIA Motors Slovakia Ltd. on ControlLogix and
                      PVP system
Customer: Rockwell Automation Slovakia ltd.
Coordinator: Juraj Ždánsky
Co-operators: Jozef Hrbček

Contract number: P-103-0010/11
Contract name: Educational training for KIA Motors Slovakia Ltd. on ControlLogix and
                      PVP system
Customer: Rockwell Automation Slovakia Ltd.
Coordinator: Juraj Ždánsky
Co-operators: Jozef Hrbček.

6   Other Activities

6.1   Conferences, Workshops, Symposiums Organized by the Department

-   19th International symposium EURNEX - Žel 2011 "New challenges for European
    railways", 8th – 9th June 2011, Žilina, SR (organising committee chairman: Karol
    Rástočný, organising committee member: Peter Nagy)
-   Workshop Concretization of cooperation form based on frame contract SkyToll – UoŽ,
    8th February 2011, University of Žilina (coordinator: Rastislav Pirník)
-   Excursion for 1st class MSc. degree students of Process control study programme at the
    railway station Vrútky – freight st. (electromech. interlocking device, mechanized hump
    yard), 10th May 2011 (Peter Nagy)
-   Excursion for 2nd class MSc. degree students of Process control study programme at the
    railway stations Krásno nad Kysucou and Čadca – electronic interlocking devices
    Siemens SIMIS W, AŽD ESA 33 and Bombardier Ebilock 950, 26th November 2011
    (Peter Nagy)

- Excursion for 2nd class MSc. degree students of Process control study programme at the railway station Vrútky – relay interlocking device with digital selection, 5th December 2011 (Peter Nagy)
- Excursion for 2nd class MSc. degree students of Process control study programme at the Traffic control centre of Czech Railways in Přerov – control system AŽD DOZ 1, 9th December 2011 (Peter Nagy)

6.2   Specialised Lectures, Courses Organized by the Department

Dynamic weighting of traffic flow and its utilisation in praxis – expert course under the auspices of Ministry of Transportation, Building and Regional Development of Slovak republic

Customer: Betamont, Ltd., Zvolen
Guarrantee: Juraj Spalek
Date: 22nd – 23rd June 2011

Information systems security management
Customer: Lecture for students of Safety process engineering study program
Lecturer: Martin Šuták; GiTy Inc., Martin
Date: 24th October 2011

Fundamentals of traffic engineering. ICT – Information acquisition, processing and interpretation. ICT in transportation, chosen technologies, NDIC. – lectures for students of accredited educational programme of further education guaranteed by the Faculty of Operation and Economics of Transport and Communications
Customer: Public administration and Police forces of SR
Lecturer: Aleš Janota
Date: June 2011

Centralised control of railway traffic
Target group: students and employees of DCIS
Lecturer: Géza Tarnai

6.3   Invited Lectures/Papers

Safety appraisal of safety systems. (Biztosítóberendezések biztonságának értékelése)
Lecturer: Karol Rástočný; Izabela Krbilová
Where/When: TU Budapest, March 2011

ITS Communication Infrastructure
Lecturer: Rastislav Pirník
Where/When: Faculty of Mechanical Engineering, University of Žilina, 5th April 2011

Safety evaluation of data transmission within safety-related control systems
Lecturer: Mária Franeková
Where/When: Silesian University of Technology, Faculty of Transport, Katowice, Poland, 12th May 2011

Safety analyses of safety - related control system for railway signalling applications
Lecturer: Karol Rástočný
Where/when: TU Katowice, May 2011

6.4   Membership in International Institutions/Committees

Franeková Mária
- member of Programme Committee of 11th International conference *Transport Systems Telematics* TST'11, Katowice-Ustroń, Poland : 19th – 22nd October 2011
- member of Editorial Board of International scientific magazine *Advances in Electrical and Electronic Engineering*, Poland, ISSN 1804-3119
- member of Editorial Board of International scientific magazine *Archives of Transport System Telematics*, CR, ISSN 189-8208

Janota Aleš
- member of DC TUD COST - Domain Committee for Transport and Urban Development – European Cooperation in Science and Technology, Brussels
- member of Programme Committee of 11th International conference *Transport Systems Telematics* TST'11, Katowice-Ustroń, Poland : 19th – 22nd October 2011
- member of Programme Committee 9th International Navigational Symposium on Marine Navigation and Safety of Sea Transportation Trans-Nav 2011, Gdynia, Poland: 15th 17th June 2011
- member of Programme Committee 15th international conference "Computer Aided Science, Industry and Transport" TRANSCOMP 2011, Zakopané, Poland: 5th – 8th December 2011
- chairman of Editorial Board of international scientific magazine *Archives of Transport System Telematics,* Poland ISSN 1899-8208
- member of Scientific Board of Faculty of Transport and Electrotechnics, Politechnika Radomska, Radom, Poland
- member of ACM – Association for Computing Machinery, USA
- member of International Institute of Informatics and Systemics, USA

Rástočný Karol
- member of Programme Committee of 11th International conference *Transport Systems Telematics* TST'11, Katowice-Ustroń, Poland : 19th – 22nd October 2011
- member of Programme Committee of 9th International conference IEEE *Applied Electronics,* Pilsen, CR: 7th – 8th September 2011
- member of Editorial Board of international scientific magazine *Transport Problems*, ISSN 1896-0596
- member of Editorial Board of international scientific magazine *Archives of Transport System Telematics,* ISSN 1899-8208
- member of Editorial Board of international scientific magazine *Advances in Electrical and Electronic Engineering*, Poland, ISSN 1804-3119

Spalek Juraj
- vice chief editor of *Annals of Faculty Engineering Hunedoara – Journal of engineering* scientific magazine, ISSN 1584-2665; Index COPERNICUS – Journal Master List, available on the internet <http://journals.indexcopernicus.com>, Genamics JournalSeek database, available on the internet <http://journalseek.net/>, http://annals.fih.upt.ro/associateeditors.html
- member of Scientific Board *ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering,* e-ISSN: 2067-3809, Edited by Faculty of Engineering Hunedoara University Politehnica Timisoara, http://acta.fih.upt.ro/bibliographic-info.html
- member of Programme Committee of international scientific magazine *Archives of Transport System Telematics,* Polish Association of Transport Telematics, ISSN 1899-8208
- member of Programme Committee of 11th International conference *Transport Systems Telematics* TST'11, Katowice-Ustroń, Poland : 19th – 22nd October 2011
- member of appraisal team of symposium and multiconference The 8th International Symposium on Risk Management and Cyber-Informatics: RMCI 2011 In the Context of The 15th Multi-conference on Systemics, Cybernetics and Informatics: WMSCI 2011 July 19 - 22, 2011, Orlando, Florida, USA

6.5 Membership in National Institutions/Committees

Franeková Mária
- member of Technical standardisation committee nr. 83, Slovak Institute of Technical Standardisation, Bratislava
- member of PROFIBUS.sk association, FEI STU Bratislava
- member of SSKI association (Slovak society for cybernetics and informatics), SAS Bratislava

Janota Aleš
- member of Technological standardisation committee TK 104 Control of industry processes, Slovak Institute of Technical Standardisation (SÚTN) Bratislava
- member of Programme Board of 19th International symposium EURNEX - Žel 2011 "New challenges for European railways", 8th – 9th June 2011, Žilina, SR

Rástočný Karol
- member of Programme Board of International conference on railway communication and interlocking technology, Vyhne: 9th – 11th February 2011
- member of Programme Board of 19th International symposium EURNEX - Žel 2011 "New challenges for European railways", 8th – 9th June 2011, Žilina, SR
- member of Organising Board of 19th International symposium EURNEX - Žel 2011 "New challenges for European railways", 8th – 9th June 2011, Žilina, SR
- member of Technological standardisation committee Nr. 83, SÚTN Bratislava
- member of Editorial Board of AT&P journal, ISSN 1335-2237, SR

Spalek Juraj
- member of Slovak Society for Informatics and Cybernetics (SSKI)
- member of Slovak Society for Applied Cybernetics and Informatics (SSAKI)
- member of Working Group for technical sciences of Slovak Research and Development Agency (SRDA)
- member of Intelligent Transportation Systems Association Slovakia

6.6 Membership in University Boards

Bubeníková Emília
- member of executive board of KAP FEE association

Franeková Mária
- chairman of KAP EF association
- member of Branch Committee of 5.2.14 Automation at the FEE University of Žilina
- member of Organisational Board of Children university of Žilina, 11th – 15th July 2011

Janota Aleš
- member of Scientific Board of FEE University of Žilina
- member of Branch Committee for science branch 5.2.14 Automation
- faculty coordinator of Erasmus programme

Rástočný Karol
- chairman of Branch Committee for study branch 5.2.14 Automation
- member of Scientific Board of FEE University of Žilina
- member of FEE University of Žilina senate

Spalek Juraj
- member of Editorial Board of scientific magazine *Advances in Electrical and Electronic Engineering* (AEEE)
- member of Scientific Board of University of Žilina
- member of Scientific Board of FEE University of Žilina
- member of Scientific Board of FME University of Žilina
- member of Branch Committee 5.2.14 Automation FEE University of Žilina
- member of Scientific Board of 9th European Conference of Young Research and Scientific Workers in Transport and Telecommunications TRANSCOM 2011, 27th - 29th June 2011, section Information and Communication Technologies, Žilina

- member of Programme Board ICCIT 2011 (International Conference on Cybernetics and Information Technologies), 14th – 15th September 2011, Terchová, SR
- member of Scientific Board of International seminar Middle European School of Doctor Study 20th – 22nd September 2011, Trenčianske Teplice

6.7   Awards

Janota Aleš: Silver medal for long-term cooperation granted by the president of ELTODO Prague company Msc. Libor Hájek 21st November 2011 on the occasion of 20th anniversary of company

Spalek, Juraj: Thankful letter from the director of strategy section of Ministry of Transport of Czech republic Luděk Sosna, PhD. Nr. 19/2011-520-TPV/2 from 27th January 2011 for long-term opponent work of research projects within the research programme „Support of realisation of a sustainable transportation development ".

Spalek Juraj: Silver medal for long-term cooperation granted by the president of ELTODO Prague company Libor Hájek 21st November 2011 on the occasion of 20th anniversary of company

Spalek, Juraj: Thankful letter from the director of Research and development support agency of Ministry of Education SR (APVV) for a successful cooperation in year 2011. Bratislava

7   Publications

7.1   Conference Proceedings Reviewed

- contributions published in reputable foreign publisher or published by worldwide reputable scientific institutions

[1]   GAVULOVÁ, A. - PIRNÍK, R. - HUDEC, R.: Technical support of traffic control system of Slovak agglomerations in NaTIS project. In: *Modern transport telematics11th international conference on transport systems telematics*, TST 2011, Katowice-Ustrón, Poland, October 2011, selected papers. - Berlin Heidelberg: Springer-Verlag, 2011, ISBN 978-3-642-24659-3. - pp. 382-391. AEC

[2]   GAVULOVÁ, A. - PIRNÍK, R.: Design of urban intelligent transport systems in Slovak conditions. In: *Reliability and Statistics in Transportation and Communication* (RelStat´ 11) the 11th international conference, 19-22 October 2011, Riga, Latvia proceedings. - Riga: Transport and Telecommunication Institute, 2011. ISBN 978-9984-818-46-7. pp. 266-274. AFC

[3]   GREGOR, M. – SPALEK, J.: Fitness-based Adaptive Control of Parameters in Genetic Programming. Proc. of 2011 *IEEE International Conference on Intelligent Computing and Intelligent Systems* (ICIS 2011), November 18-20, 2011, Guangzhou, China, IEEE Catalogue Number: CFP1157H-CDR, ISBN 978-1-61284-143-4, pp. 340-344 (IEEE Xplore and indexed in Ei Compendex)

[4]   HALGAŠ J. – JANOTA, A.: Technical Devices Cooperation to Obtain Data for 3D Environment Modelling. In: *Communications in Computer and Information Science 239, Modern Transport Telematics*, Springer-Verlag Berlin Heidelberg 2011 (pp. 330-337), 2011, ISSN 1865-0929, ISBN 978-3-642-24659-3, e-ISSN 1865-0937, e-ISBN 978-3-642-24660-9

[5]   RÁSTOČNÝ, K. – ILAVSKÝ, J.: Effects of a periodic maintenance on the safety integrity level of a control system. In: *Proceeding of the 8th Symposium on Formal Methods for Automation and Safety in Railway and Automotive Systems* FORMS / FORMAT 2010. Braunschweig. pp. 77-85, Berlin, Springer-Verlag, 2011. - ISBN 978-3-642-14260-4 (in Springer-Verlag database)

[6] LOBOTKOVÁ, Z. – JANOTA, A.: Petri Net-based Functional Representation of a Level Crossing. Communications in Computer and Information Science 239, In: *Modern Transport Telematics*, Springer-Verlag Berlin Heidelberg 2011 (pp. 118-125), 2011, ISSN 1865-0929, ISBN 978-3-642-24659-3, e-ISSN 1865-0937, e-ISBN 978-3-642-24660-9

[7] NAGY, P.: EURO-ŽEL 2011: 19th International Symposium "Recent Challenges for European Railways": Proceedings – editor of <u>printed</u> version / Peter Nagy. - Prvé. - Brno : Tribun EU, 2011. - 430. ISBN 978-80-263-0003-8

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[10] PALECEK, J. - VESTENICKY, P. - VESTENICKY, M. - SPALEK, J.; "Optimization of microstrip filter dimensions by differential evolution algorithm," Intelligent Engineering Systems (INES), 2011 15th IEEE International Conference on Intelligent Engineering Systems INES 2011, June 23th – 25th 2011, Poprad, Slovakia, pp. 173 – 176. ISBN 978-1-4244-8954-1.(IEEE Explore)

[11] RÁSTOČNÝ, K. – ILAVSKÝ, J.: What Is Concealed behind the Hazardous Failure Rate of a System? In: *Communications in Computer and Information Science*, Volume 104: Modern Transport Telematics. ISSN 1865-0929. Berlin: Springer-Verlag, 2011. ISBN 978-3-642-24660-9. (2011), pp. 372-381 (in Springer-Verlag and Scopus databases)

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[12] MORAVČÍK, T. – MUZIKÁŘOVÁ, Ľ.: Eye Blink Analysis for Detection of Human Fatigue in Video Sequence, In: *RTT-2011*, ISBN 978-80-214-4283-2

[13] VÝROSTKO M.: Cryptography algorithms and their safety evaluation in ERTMS system. Applications In: *XIII International PhD Workshop OWD 2011*. Conference archives PTETiS vol.29 2011, Wisla, Poland. ISBN:83-922242-8-0

- national conference with international programme board in world language

[14] CEROVSKÁ, A. – SPALEK, J.: Influence of overloaded and over-dimensioned heavy traffic to traffic flow safety in road tunnels, In: *9th European Conference of Young Research and Scientific Workers in Transport and Telecommunications TRANSCOM 2011*, Žilina, 27.-29.6.2011, ISBN 978-80-554-0369-4, pp. 11-14

[15] HALGAŠ, J. – JANOTA, A.: Introductory Notes to Design of 3D Model of Road Communication for Intelligent Transport System Applications. In: *Proc. of the Central European School of Doctoral Study,* Trenčianske Teplice, Slovakia: September 20-22, 2011 (pp. 88-92). ISBN 978-80-554-0421-9

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[20] LOBOTKOVÁ, Z. – JANOTA, A.: Level Crossing Risk from the Viewpoint of Individual Factors. In: *Proc. of the Central European School of Doctoral Study*, Trenčianske Teplice, Slovakia: September 20-22, 2011 (pp. 61-64). ISBN 978-80-554-0421-9

[21] ĽUPTÁK, J.: Safety Mechanisms and Solutions within Profile OpenSafety. In: *Proceedings of the international conference TRANSCOM 2011, 9-th European Conference.* 27-29.6.2011, Žilina ISBN: 978-80-554-0369-4

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[24] VÝROSTKO M.: Cryptography Protocol Used in EURORADIO System within Railway Applications In: *Proceedings of the international conference TRANSCOM 2011, 9-th European Conference.* June 27-29 2011, Žilina ISBN: 978-80-554-0369-4

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[31] RÁSTOČNÝ, K. – ILAVSKÝ, J.: Quantification of the safety level of a safety-critical control system. In: Proceeding of the International Conference on Applied Electronics, AE 2010, (2010), art. no. 5599659, pp. 285-288. ISBN: 978-807043865-7

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[32] RÁSTOČNÝ, K.: Applications of Interlocking Systems. (2006), EDIS, ŽU. Slovak, Žilina ISBN 80-8070-546-1

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[34] JANOTA A. - DADO M. - SPALEK J.: Greening Dimension of Intelligent Transport. Journal of Green, Engineering, River Publishers, Vol. 1, No 1, October 2010, ISSN 1904-4720, pp. 55-66

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in Transportation and Communication (RelStat'11), 19th – 22nd October 2011. Riga, Latvia, pp 266 - 274

[35] SPALEK, M. GREGOR: Adaptive approaches to Parameter Control in Genetic. In: Algorithms and Genetic Programming. Applied computer science, Vol. 7. no. 1, 2011, pp. 38-56, Improvements methods in manufacturing design, scheduling and control. Lublin University of technology, Institute of technological systems of information. ISSN 1895-3735, ISBN 978-83-62596-32-4

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[36] JANOTA, A. – RÁSTOČNÝ, K. - ZAHRADNÍK, J.: Multi-agent approach to traffic simulation in NetLogo environment – level crossing model. Zeszyty Naukowe, Nr. 1691, Zeszyt 59 Transport, Gliwice, 2005 (pp. 181-188). PL ISSN 0209-3324.

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Citing work: Chen XIANGXIAN – He YULIN – Huang HAI: A component-based topology model for railway interlocking systems. Mathematics and Computers in Simulation, Volume 81, Issue 9, May 2011 (pp. 1892-1900). ISSN 0378-4754, doi:10.1016/j.matcom.2011.02.007 [Current Contents]

Citing work: Chen XIANGXIAN – He YULIN – Huang HAI: An Approach to automatic development of interlocking logic based on statechart. Enterprise Information Systems 5 (3), 2011 (pp. 273-286). ISSN 1751-7575

7.2 Journals

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- from the Thomson Scientific Master Journal List (MJL) and Scopus

[38] FRANEKOVÁ, M.: Mathematical apparatus for safety evaluation of cryptography and safety codes used in safety related communication system. In: *Modern transport telematics: 11th international conference on transport systems telematics, TST 2011*, Katowice-Ustrón, Poland, October 2011, selected papers: Springer-Verlag. Berlin Heidelberg editor series CCIS 104 - Communications in Computer and Information Science. ISBN 978-3-642-24659-3. - pp. 126-135. (Springer database) AFC
[39] PIRNÍK, R. - HALGAŠ, J. - ČAPKA, M. : Non-invasive monitoring of calm traffic. In: *International symposium on advanced engineering & applied management - Acta technica Corviniensis*: bulletin of engineering. - ISSN 2067-3809. - Tom. 4, fasc. 1 (2011), pp. 111-115. ADE
[40] SLEZÁK, J. - SPALEK, J.: The Increase Safety of Operation and Control Traffic on the Minor Railway-Tracks, In: *Communications* – Scientific Letters of the University of Žilina, vol.13, 2A/2011, ISSN 1335-4205, pp. 79-82 (SCOPUS)
[41] VESTENICKÝ, M. - VESTENICKÝ, P. - HOTTMAR, V.: Determination of Low Pass Filter Coefficients for Receiver with Zero Intermediate Frequency by Differential

Evolution Algorithm. In: *Infocommunications journal* (Híradástechnika), Vol. 3, No. 1, 2011, pp. 17 - 21. ISSN 2061-2079. Indexed: Scopus

[42] VESTENICKÝ, M. - VESTENICKÝ, P.: LPG Concentration Measurement in Vehicles Transporting Dangerous Goods. In: *Communications*, Scientific Letters of the University of Žilina, vol. 13, No. 2a/2011, pp. 92 - 96. ISSN 1335-4205. Indexed: Scopus

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[43] FRANEKOVÁ, M. – RÁSTOČNÝ, K. – JANOTA, A. – CHRTIANSKY, P.: Safety analysis of cryptography mechanisms used in GSM railway. In: *Annals of Faculty Engineering Hunedoara* – International Journal of Engineering, Tome IX (2011), Fascicule1 (pp. 207-212), ISSN 1584-2665

[44] FRANEKOVÁ, M. - VÝROSTKO, M.: Safety evaluation of cryptography modules within safety - related control system for railway applications. In: *Advances in Electrical and Electronic Engineering AEEE*. Control Engineering, ČR, Vol. 9. No 02, June 2011, pp. 1-6, ISSN 1804-3119. ADE. (database Directory of Open Access Journals)

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[46] JANOTA, A. – ŠEBEŇOVÁ, J.: Slovak Level Crossings – Present State and Knowledge-Based Approach to Diagnostics. The Open Transportation Journal, 2011, 5, (pp. 23-33) ISSN 1874-4478 [DOI: 10.2174/1874447801105010023] http://www.benthamscience.com/open/totj/article/V005/SI0021TOTJ/23TOTJ.pdf

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[48] MORAVČÍK, T. - BUBENÍKOVÁ, E. - MUZIKÁŘOVÁ, Ľ: Detection of determined eye features in digital image, In: *Annals of faculty engineering Hunedoara* – International Journal of Engineering, Tome IX (Year 2011), fascicule 1., p.155-160, ISSN 1584-2665

[49] ONDRAŠINA, T.- FRANEKOVÁ, M.: Safety mechanisms of ZigBee technology for safety related industrial applications. In: *Archives of Transport System Telematics*. International Scientific Journal of Polish Association of Transport Telematics, Volume 4, Issue 2. May 2011, Poland, pp. 43-47, ISSN 1899-8208. ADE.

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[51] MIKLUŠČÁK, T. – GREGOR, M.: Person Movement Prediction Using Artificial Neural Networks with Dynamic Training on a Fixed-Size Training Data Set, In: *Applied Computer Science Management of Production Processes*. Vol. 7, no. 2 (2011), ISSN 1895-3735, ISBN 978-83-62596-32-4, Lublin University of Technology, PL, pp. 43-56.

[52] SPALEK, J. - GREGOR, M.: Adaptive Approaches to Parameter Control in Genetic Algorithms and Genetic Programming. In: *Applied computer science*, Vol. 7, no 1, 2011, pp. 38-56, Improvements methods in manufacturing design, scheduling and control. Lublin University of technology, Institute of technological systems of information. ISSN 1895-3735, ISBN 978-83-62596-32-4

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control. Lublin University of technology, Institute of technological systems of information. ISSN 1895-3735, ISBN 978-83-62596-32-4

[54] ŠIMÁK, V. - HRBČEK, J. - ŽDÁNSKY, J.: Modular approach during on-board unit development, Journal of Information, Control and Management Systems, ISSN 1336-1716, pp. 139-143, Volume 9, Number 2, 2011

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[55] FRANEKOVÁ, M. - ONDRAŠINA, T.- VÝROSTKO, M.: Probabilistic failure analysis of cryptographic code for safety relevant applications. In: *Journal of Information, Control and Management Systems,* Vol. IX, (2011), No.3, Special Issue for Centre Excellence for Intelligent Transport Systems and Services. ISSN 1336-1716. ADF.

[56] HALGAŠ, J. - BUBENÍKOVÁ, E.- PIRNÍK, R. - RÁSTOČNÝ, K.: Non-invasive traffic monitoring in University of Žilina campus with the use of CEX I project resources, In: *Journal of Information*, Control and Management Systems, Vol. IX, (2011), No.3, Special Issue for the Centre of Excellence for Intelligent Transport Systems and Services

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[58] MATIS P. – SPALEK, J.: Use of intelligent transportation systems in road tunnels in SR, Technologies in Transport, In: *Journal of Information, Control and Management Systems*, Vol. X, (2011), No.3, ISSN: 1336-1716

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[60] SPALEK J. - CEROVSKÁ A. – MATIS, P.: Telematics- Based Safety Technologies in Transport, In: *Journal of Information*, Control and Management Systems, Vol. X, (2011), No. X, ISSN: 1336-1716 (in print)

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[62] ĽUPTÁK, J.: Modelling of safety properties of transmission systems for industrial applications. Dissertation thesis. Study branch Automation; specialization Process control. November 2011, (supervisor: Mária Franeková)

[63] MORAVČÍK, T.: Operator vigilance monitoring with the use of digital signal processing methods. Dissertation thesis. Presented in September 2011 (supervisor: Ľudmila Muzikářová)

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7.3 Book publications

- monograph – foreign, number of author sheets

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[65] PŘIBYL, P. – BARTÁK, J.: Tunnels on road communications, Czech technics – CTU publisher, 1st edition, 384 pages, December 2011, ISBN 978-80-01-04723-1

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- specialised - foreign , number of author sheets

[66] HRBČEK, J. - ŠIMÁK, V.: Implementation of Multi-dimensional Model Predictive Control for Critical Process with Stochastic Behaviour, chapter in: Advanced Model Predictive Control, p.109-124, InTech, Tao Zheng (Ed.), Croatia: June 2011, ISBN 978-953-307-298-2, Available from: http://www.intechopen.com/book/advanced-model-predictive-control

- monograph - SR, number of author sheets
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[67] JANOTA, A. – et al.: Fundamentals of traffic engineering – educational texts of accredited educational programme of further education, POA Nr.: 3217/2011/27/1. Author of chapters: ICT – Acquisition, processing and interpretation (pp. 91-94), ICT in transportation, chosen technologies, NDIC (pp. 95-98), ISBN 978-80-554-0384-7

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7.4 Reviews

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[72] Janota, Aleš: Lector review of a contribution into Communications – Scientific Letters of the University of Žilina. ISSN 1335-4205

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[74] RÁSTOČNÝ, Karol: Battery Power Module with Tri-Port DC-to-DC Converter. IEEE - International Conference on Applied Electronics, AE 2011; Pilsen, 2011

[75] RÁSTOČNÝ, Karol: Data Synchronization for Independent USB Devices. IEEE - International Conference on Applied Electronics, AE 2011; Pilsen, 2011

[76] RÁSTOČNÝ, Karol: The Heat and Cooling of Electronically Switching Synchronous Machine as a Main Drive of a Car. IEEE - International Conference on Applied Electronics, AE 2011; Pilsen, 2011

[77] RÁSTOČNÝ, Karol: MAREK, J.: Assessment of ETCS-definition in Terms of Its Formalisation. International Symposium EURO-ZEL 2011, Žilina

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8   Contact Address

Department of Control and Information Systems
Faculty of Electrical Engineering
University of Žilina
Univerzitná 1, 010 26 Žilina
Slovak Republic
Phone:+421-41-513 3301
Fax: +421-41-513 1515
E-mail:kris@fel.uniza.sk
www: http://kris.uniza.sk/english

Katedra riadiacich a informačných systémov
Elektrotechnická fakulta
Žilinská univerzita
Univerzitná 1, 010 26 Žilina
Slovenská republika