DEPARTMENT OF CONTROL AND INFORMATION SYSTEMS

General Information

The Department of Control and Information Systems (further referred to as the DCIS) guarantees four study programmes in the field of study Automation at the University of Žilina. Specifically, it is the study programme Automation in Bachelor degree, study programme Process Control Engineering and Applied Telematics in Master degree and study programme Process Control Engineering in the Doctoral degree.

The research activities of DCIS are oriented in the field 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 activities in the field of analysis and synthesis of railway interlocking systems.

The area 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.

The 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 2017, the staff of the DCIS consisted of 17 pedagogical staff, 2 technicians and administrative support and 5 full-time postgraduate students. The pedagogical staff consisted of 4 professors, 1 guest professor, 3 associate professors, 7 senior lecturers with PhD. degree, and 2 research fellows with a PhD. degree.

Staff of the Department

Head of the Department:	Juraj Spalek
Vice-head of the Department:	Aleš Janota
Secretary:	Rastislav Pirník
Study Consultant:	Peter Nagy
Administrative Support:	Klára Berešíková
Technical Support:	Kamila Kršíková
Research Fellows:	Michal Gregor, Marián Hruboš

Sections of the Department

Section of Automation and Signalling Systems

Head of the Section:	Karol Rástočný
Professors:	Aleš Janota, Karol Rástočný, Juraj Spalek, Pavel Přibyl
Associate Professors:	Juraj Ždánsky
Senior Lecturers (with PhD):	Jozef Hrbček, Vojtech Šimák, Peter Nagy

Section of Communication and Information Systems

Head of the Section:	Mária Franeková
Professors:	Mária Franeková
Associate Professors:	Peter Vestenický, Peter Peniak
Senior Lecturers (with PhD):	Emília Bubeníková, Peter Holečko, Alžbeta Kanáliková, Rastislav Pirník

Postgraduate Students

Internal (full-time):	Jozef Valigurský (since September 2017), Peter Ždánsky (since September 2017), Jozef Balák, Dušan Nemec, Peter Kello

Education

Courses in Bachelor and Master Degree Programmes

Bachelor Degree Programmes

Code	Title	Sem.	Hours/Week
			L-S-LE*
Courses at the Faculty of Electrical Engineering			
3B0102	Algorithmisation and programming	1	2 - 2 - 0
3B1100	Professional praxis (60 hours)	1	0 - 0 - 0
3B0203	Programming in C++	2	2 - 2 - 0
3B1200	Professional praxis (60 hours)	2	0 - 0 - 0
3B0304	Theory of information and signals	3	3 - 2 - 1
3B1301	Professional praxis (60 hours)	3	0 - 0 - 0
3B1300	Information and communication networks	3	1 - 0 - 2
3B1400	Theory of automated control	4	3 - 1 - 1
3B1401	Logical systems	4	2 - 1 - 1
3B1402	Distributed control systems	4	3 - 1 - 1
3B1403	Sensor technology	4	3 - 0 - 1
3B0401	Computer technical environment	4	1 - 0 - 1
3B1404	Professional praxis (60 hours)	4	0 - 0 - 0
31520	Bachelor project 1 A	5	0 - 0 - 5
31521	Communication security	5	3 - 1 - 1
31534	Single-chip controllers programming	5	2 - 0 - 2
31536	Sensor technology	5	3 - 1 - 1
31541	Reliability and safety of control systems	5	3 - 2 - 0
31612	Information systems	5	3 - 1 - 1
31521	Communication security	5	3 - 1 - 1
31600	Bachelor thesis and its presentation	6	0 - 0 - 5
31613	Law aspects in industrial electrical engineering	6	4 - 4 - 0
31620	Bachelor project 2 A	6	0 - 0 - 10
31623	Control systems programming	6	2 - 0 - 3

*(L) lectures - (S) seminars - (LE) laboratory exercises

Master Degree Programmes

Code	Title	Sem.	Hours/Week
			L-S-LE*
Courses at the Faculty of Electrical Engineering			
3I0101	Advanced methods of automated control	1	3 - 1 - 1
3I0102	Communication networks	1	3 - 1 - 1
3I0103	Signal processing theory in process control	1	2 - 1 - 1
3I1100	Telematic systems modelling	1	3 - 1 - 1
3I7100	Control systems with Safety PLC	1	2 - 0 - 2
3I0104	Interlocking and signalling systems components	1	3 - 0 - 2
3I0115	Information systems security	1	3 - 0 - 2
3I1101	Professional praxis (60 hours)	1	0 - 0 - 0
3I7101	Professional praxis (60 hours)	1	0 - 0 - 0
3I0200	Application of information systems in process control	2	2 - 0 - 2
3I0201	Secure system communication	2	3 - 1 - 1
3I0202	Control systems safety analysis	2	3 - 2 - 0
3I0203	Artificial intelligence 1	2	2 - 0 - 2
3I0204	Higher programming languages applications	2	2 - 0 - 2
3I0205	Safety systems	2	3 - 1 - 1
3I1200	Professional praxis (60 hours)	2	0 - 0 - 0
3I7200	Professional praxis (60 hours)	2	0 - 0 - 0
3I0300	Artificial intelligence 2	3	3 - 0 - 2
3I0301	Visualisation of processes	3	2 - 0 - 2
3I0318	Object-oriented system development	3	2 - 0 - 2
3I1300	Transport processes control	3	3 - 1 - 1
3I7301	Applied telematics diploma project 1	3	0 - 0 - 5
3I7300	Process control diploma project 1	3	0 - 0 - 5
3I0302	Interlocking systems applications	3	2 - 0 - 2
3I0303	Information systems security	3	3 - 0 - 2
3I1303	Professional praxis	3	0 - 0 - 0
3I7301	Professional praxis	3	0 - 0 - 0
3I0401	Automated identification	4	2 - 1 - 1
3I1402	Elaboration and presentation of diploma thesis	4	0 - 10 - 0
3I1403	State exam subject	4	0 - 2 - 0
3I7400	Process control diploma project 2	4	0 - 0 - 5
3I7401	Elaboration and presentation of diploma thesis	4	0 - 10 - 0
3I7402	State exam subject	4	0 - 2 - 0
32338	Robotic systems	4	4 - 0 - 2
32411	Intelligent transportation systems	4	4 - 2 - 0
3I1404	Professional praxis (60 hours)	4	0 - 0 - 0
3I7404	Professional praxis (60 hours)	4	0 - 0 - 0

*(L) lectures - (S) seminars - (LE) laboratory exercises

Code	Title	Sem.	Hours/Week
			L-S-LE*
Courses at the Faculty of Electrical Engineering			
3D3100	World language	1	2 - 0 - 0
3D3101	Secure system communication	1	2 - 0 - 0
3D3102	Logical and event systems	1	2 - 0 - 0
3D3104	Process control	1	2 - 0 - 0
3D3105	Control systems	1	2 - 0 - 0
3D3109	Selected chapters from mathematics	1	2 - 0 - 0
3D3103	Modelling and simulation of control systems	2	2 - 0 - 0
3D3106	Reliability and safety of control systems	2	2 - 0 - 0
3D3107	Theory of automated control	2	2 - 0 - 0
3D3108	Signal processing theory in process control	2	2 - 0 - 0
3D3110	Written exam for dissertation exam and defence	3	0 - 0 - 0
3D3111	Dissertation thesis and dissertation thesis defence	6	0 - 0 - 0

*(L) lectures - (S) seminars - (LE) laboratory exercises

Research & Development

The scientific-research and development activities of department are focused on the area of control tasks algorithmisation, automation of control on process, operational and management levels, while utilising modern artificial intelligence approaches, and on the area of reliable, safe and secure communication and information processing in control of selected critical processes, above all the ones which imply the criterion of safety besides usual optimisation criteria. For reasons given there is a large number of research projects and cooperation projects with praxis and industry directed into the area of applied telematics and intelligent control and safety systems in transport and industry.

Laboratory of industrial processes control

The laboratory is oriented on development and simulation of algorithms for industrial processes control. The fundamentals of equipment are PCs, Siemens PLCs, extension modules for sensors and actuators connection, modules for remote inputs and outputs, visualisation panels, frequency converters and programming and configuration software. The interconnection of components and positions is realised by industrial networks. Actual models of industrial processes support the operation of this technology.

Laboratory of safety critical control systems

The laboratory focuses on development of safety related control systems mainly utilised for railway traffic control. The fundamentals of technology equipment are PCs and Siemens PLCs with software support. The laboratory provides real interlocking systems by Scheidt&Bachmann (BUES2000 electronic railway crossing devices and ZBS2000 electronic safe traffic control for auxiliary tracks). The devices also include railway interlocking devices building components (distinct relay constructions used in interlocking technology, signalling lights, switching locks, …).

Laboratory of traffic processes control

The laboratory is focused on the area of system identification, design and implementation of control algorithms for traffic and industrial systems. It is equipped with programmable logical automata by Bernecker + Rainer (B&R), safety PLCs, I/O modules, converters, traffic and industrial systems models and specialised computers with software; Automation Studio, Safe Designer, MATLAB, Simulink, Atmel Studio.

Laboratory Betamont

The laboratory aims on experimental works of PhD. students and final degree students of bachelor and master programmes. The focus is the area of development, customisation and realisation of experimental communication subsystem of Intelligent Transportation Systems (ITS). The development heads towards display appliances in the function of dynamic traffic signs, information panels and similar, primarily in the direction ITS infrastructure – driver. The development in laboratory also includes applications of distinct communication standards, primarily intended for the communication between vehicles, vehicles and infrastructure and between ITS infrastructure objects.

The laboratory is built within the following projects: „Centre of excellence for intelligent transportation systems and services I", „Centre of excellence for intelligent transportation systems and services II" and „New methods for measuring dynamic properties of motor vehicle and its interaction with roadway" (in cooperation with BETAMONT), which have been acquired in the operational programme Research and development by the EU Structural funds agency of Slovak Department of Education.

Laboratory of information technologies

The laboratory is oriented on information systems (databases, web technologies, virtualisation), computer networks (modelling, simulation, monitoring) and its safety (penetration testing, intrusion detection, firewalls, cryptanalysis, antimalware). The hardware equipment consists of Juniper IDP 75 – intrusion detection system; Fluke Networks Time Machine Express NTM - EX2 – network traffic monitoring device; wireless technologies. The software equipment consists of Riverbed Modeler + Wireless Suite – network modelling, simulation and emulation environment; Riverbed Modeler Academic Edition – academic edition of environment; PRTG Paessler Network Monitor – network traffic monitoring tool, Pwnie Plug R4 – network penetration testing appliance.

Laboratory of experimental tasks

The laboratory is intended for experimental operations related to bachelor, master and research tasks including realisation of electronic devices.

Laboratory of automated control theory and signal processing

The laboratory is aimed on testing of theoretical fundamentals from the area of automated control theory (continuous and discrete systems), theory of information and signals and digital signal processing with custom programs and MATLAB with its specialised toolboxes (Simulink, Control Toolbox, Signal Processing Toolbox). It includes actual educational models by Humusoft CE 151 (ball on plane) with accessories (Extended Real Time Toolbox and Real Time Windows Target) and appliances by IMFsoft (motor rpm regulator, temperature regulation) and bachelor and master projects appliances.

Joint laboratory of tunnel systems

The laboratory serves for experimental works for bachelor, master and doctoral. students by providing a joint laboratory of tunnel systems (JLTS) as a competence centre, which systematically cooperates on optimisation of equipment and permanent increasing of safety of tunnel systems in Slovak and Czech Republic. The laboratory is built within the projects „Centre of excellence for intelligent transportation systems and services II" and "Transport telematics systems research centre", which have been acquired in the operational programme Research and development by the EU Structural funds agency of Slovak Department of Education. A part of the laboratory will be a laboratory for research of methods for tunnel systems safety quantification.

Laboratory of modelling and simulation

The laboratory is aimed on education of specialised subjects requiring support of software tools. It is mainly intended for modelling of functional properties of control systems (UML; Rhapsody software tool), reliability and safety attributes (CARE software tool), control procedures and control structures (Matlab and LabView environments). In case of need, it is available for other applications – design and work with database systems, expert systems and so on. The laboratory includes technology utilised in objects protection (alarm systems, electric fire signalisation, camera surveillance systems). The laboratory can also be utilised for students' individual work during working out the semester projects and diploma theses.

Laboratory of computer networks and secure communications

The laboratory is focused on the area of LANs including wireless communication technologies. The technical equipment for computer networks includes basic PCs, structural cabling distributor, switches and routers 3com, Linksys and Cisco, IEEE 802.11 wireless networks analyser. The technical equipment for industrial communication networks includes PROFIBUS and CAN protocol analysers. The area of radio-frequency identification (RFID) is covered by the ELATEC demonstration kits for ISO 14443, ISO 15693, ISO 18092, MIFARE Classic, MIFARE Desfire, Unique transponders.

Laboratory of microcomputers and robotics

The laboratory is intended for research and development in the area of robotics and microcomputers. It is equipped with computers and programmable interfaces for ATMEL microcomputers and ABB industrial robots. It is an exact copy of a real software controlling a production robot and enables realistic simulations with the use of real robotic programs and configuration files. The laboratory hosts the research of mobile sensor platform for robots navigation. The laboratory disposes of a CNC machine with B&R control system for the realization of bachelor and diploma works. The equipment also consists of E-puck robots with Webots environment enabling testing of robotic swarm algorithms.

Projects of International Programmes

HORIZON 2020

H2020-MSCA-RISE-2016 - 734331: SENSors and Intelligence in BuiLt Environment	
Summary:	The goal of this project is to develop novel information sensing research and innovation approaches for acquiring, communicating and processing a large volume of heterogeneous datasets in the context of smart buildings, by building an international, inter-disciplinary and inter-sectoral collaboration network through research and innovation staff exchanges and seamless exchange of ideas, expertise, data, testbeds, and know-how.
Realization:	01/2017 – 12/2020
Coordinator:	Ivan Glesk, (University of Strathclyde, Glasgow, UK)
Sub-Coordinator from FEE:	Juraj Machaj
Co-operators:	Peter Holečko, Michal Gregor, Vojtech Šimák

COST Projects

TU 1305: Social networks and travel behaviour	
Summary:	COST Action TU1305 aims to initiate a new collaboration framework for the various EU research groups that develops a new transport paradigm based upon ICT social networks and their subsequent travel behaviour in the urban environment. Our goals are to explore ways in which social activities become mobilised in space, identify how social ties affect the integration of local public transport into urban patterns, and develop a rigorous conceptual framework for new ideas and methodologies.
Realization:	03/2014 – 03/2018
Coordinator:	Pnina Plaut, Technion (Israel Institute of Technology, Haifa, Izrael)
Co-operators:	Peter Holečko, Rein Ahas, Sven Kesselring, Isabelle Thomas, Lucia Cristea, ...

Other International Projects

S-103-0004/17: Safety assessment of track interlocking device RLC23	
Summary:	Agreement on research activities between Altpro d.o.o. Zagreb (Croatia) and UNIZA. The goal is the safety appraisal of RLC23 system – generic Slovak Railways application.
Realization:	2017
Coordinator:	Karol Rástočný

Projects of National Programmes

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

1/0367/15: Research and development of a new system for autonomous robot trajectory control	
Summary:	The scientific project is focused on the implementation of hybrid sensors – Inertial Navigation System (INS), into robot's control. A system with such a control can acquire a precise position of robot's effector in space. The application can be used for calibration of a robotic workplace. The calibration is necessary in order to adapt a simulated model of a production device to real geometric conditions. A simulation model of a production device and robot programming set represent an accurate representation of reality. However, an absolute correspondence with the reality cannot be expected. The deviations of reality from simulation occur because of several reasons. The implemented INS will be used for calibration without the use of calibration equipment, thereby enabling a significant simplification of calibration in praxis.
Realization:	01/2015– 12/2017
Coordinator:	Pavol Božek (Institute of applied informatics, automation and mechatronics, MTF)
Sub-Coordinator:	Rastislav Pirník
Co-operators:	Vojtech Šimák, Dušan Nemec

Projects Funded by the Cultural & Education Grant Agency (KEGA)

008ŽU-4/2015: Innovation of HW and SW tools and methods for laboratory education with focus on ICT security aspects in safety-critical process control applications	
Summary:	The goal of the project is to focus on the research in the field of evaluation of cryptographic mechanisms used for safety-critical process control applications based on modelling approach. The outcomes will be presented in a form of collective publications and a prepared monograph, as well. One of the objectives of the project is also to build up workplaces in AB 315 and AB 320 laboratories for the needs of education of subjects focusing information security.
Realization:	01/2015 – 12/2017
Coordinator:	Mária Franeková
Co-operators:	Peter Holečko (Vice Coordinator), Karol Rástočný, Peter Vestenický, Emília Bubeníková, Alžbeta Kanáliková, Rastislav Pirník, Marián Hruboš, Peter Peniak, (Continental Matador Rubber, s,r.o. Púchov) Martin Šuták, (Aliga, s.r.o. Martin), Kamila Kršíková, Jozef Balák (PhD. student)

034ŽU-4/2016: Implementation of modern technologies into education with focus on safety PLC control	
Summary:	The project is focused on bridging the shortcomings resulting from the growing demands of industry for the theoretical knowledge and practical experiences in deployment of control systems with safety PLC. The project aim is to build a laboratory in which control systems with safety PLC will be together with the physical models allowing simulation of real situations in industry. The laboratory will allow the emergence of a new subject "Control systems with safety PLC" and subsequent solution of bachelor's thesis, master's thesis and dissertations. Under the project will be developed the teaching materials supported by examples. This allows to make studying more attractive and to train students for the practical needs and finally to develop cooperation with practice primarily in the area of

	consultation about achieving the required safety integrity level (SIL - Safety Integrity Level) of realized applications.
Realization:	01/2016 – 12/2018
Coordinator:	Juraj Ždánsky
Co-operators:	Karol Rástočný (Vice Coordinator), Jozef Hrbček, Peter Holečko, Peter Nagy, Vojtech Šimák

038ŽU-4/2017: Laboratory education methods of automatic identification and localization using radiofrequency identification technology

Summary:	Automatic identification systems currently represent an irreplaceable role in the automation of industrial production, transport, logistics and trade. Among the technical means allowing automatic identification of persons, objects or animals a radio frequency identification (RFID) dominates. Taking the importance of this technology into account it is necessary that graduates of the study field "Automation" and "Telecommunication and Radio Communication Engineering" that are accredited on the Faculty of Electrical Engineering, University of Žilina, have gained deep knowledge of the principles and applications of this modern technology. The presented project sets a number of scientific and pedagogical objectives. In the scientific objectives the mathematical modelling of RFID systems and their data channels, and also the development of digital signal processing algorithms in the field of RFID are dominant. The dominant educational objectives are the building of several laboratory workplaces enabling to demonstrate the basic physical principles of identification and localization of the RFID tags and to demonstrate the data structures of most commonly used identification cards such as Mifare and Desfire.
Realization:	01/2017 – 12/2019
Coordinator:	Peter Vestenický
Co-operators:	Jozef Balák, Michal Gregor, Peter Kello, Peter Nagy, Dušan Nemec, Juraj Ždánsky

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

APVV-15-0441: Measurement system with optical sensor for the Weight In Motion systems

Summary:	Proposed project of applied research will be focused on design, optimization and creation of a device for weight measurement of a vehicle (or its axle) in movement according to the currently valid traffic regulations on the road or highway. Project will discuss the selection of proper sensor hardware for the system, its mounting into existing solutions Measure-in-Motion® previously designed by project partner and compatibility of the used optical sensor output with the interface of the existing processing unit.
Realization:	7/2016 – 6/2020
Coordinator:	Daniel Káčik
Co-operators:	Daniel Káčik, Aleš Janota, Juraj Spalek, Marián Hruboš, Rastislav Pirník, Peter Vestenický, Milan Dado, Norbert Tarjányi, Vojtech Šimák, Dušan Nemec, Jozef Hrbček, Juraj Maciak, Jakub Horka, Milan Rysula

APVV-16-0006: Automated robotic assembly cell as an instrument of concept Industry 4.0

Summary:	Global aim of the project is design of new modern concept of automated robotic assembly cell consisted of mobile manipulator, whereby manipulation task is performed by compliant manipulator. This aim is divided into partial tasks - design of mobile platform with capability of autonomous movement in unknown environment, concept of compliant manipulator with enhanced sensorial systems, which allows the manipulator better modelling of environment and interactions with human, and finally mutual cooperation of both modules to ensure the safe and stabile manipulation with objects also during the movement of robot. A suitable design of hardware and development of software will lead to construction of such unique concept, which combines actual trends in R&D in robotics.
Realization:	07/2017 – 06/2020
Coordinator:	František Duchoň (FEI STU)
Co-operators:	Aleš Janota, Juraj Spalek, Vojtech Šimák, Emília Bubeníková, Michal Gregor, Dušan Nemec, Jozef Hrbček

Projects of European Structural Funds

ITMS 313011B765: Universal virtual intelligent space for transport systems

Summary:	The research objective is in creating a system environment of information sources based on IoE, its advanced processing, connection to other life areas, searching for correlations between things, processes (information), seemingly unrelated, using these discovered dependencies in technological innovations, decision making and process control in transport and in standard living of citizens.
Realization:	09/2017 – 08/2022
Coordinator (UNIZA):	Rastislav Pirník
Project manager (UNIZA)	Rastislav Pirník
Co-operators:	Aleš Janota, Juraj Spalek, Mária Franeková, Pavel Přibyl, Peter Vestenický, Marian Hruboš, Peter Holečko, Emília Bubeníková, Vojtech Šimák, Jozef Hrbček, Michal Gregor, Alžbeta Kanáliková, Dušan Nemec

ITMS2014+313011B738: Research and development of a wireless system for prediction of potential savings of heating energy in large buildings

Summary:	The project is focusing on research and development of a wireless monitoring system WHEMS (Wireless Heating Efficiency Monitoring System) consisting of wireless agents monitoring physical quantities (heat supplied, interior and exterior temperatures, humidity, external effects, heat gains from other sources and other) at the level of individual rooms and a supervisory ICT infrastructure able to archive and process the gathered data in order to predict potential savings of heating energy in large buildings achievable by deploying an optimal regulation system. A successful development of an innovative system enables to incorporate a new service in the energy producing area, providing the possibility to design an optimal regulation system for a specific building including the definition of its return of investment. The accompanying effect of this service is the reduction of heating costs and environment protection. The project activities include research and development of wireless agents and wireless infrastructure, form the hardware and

	software aspect, development of software for the supervisory ICT infrastructure, as well as the basic research for energy saving algorithms. The target group consists mainly of state administration buildings, schools, hospitals. The project solution will be enabled by a tight cooperation of Amicus SK (Skalica) and University of Žilina development teams, thus contributing and deepening of inter-regional cooperation of these institutions to achieve new knowledge in construction, production and operation of wireless agents and ICT infrastructure used within the heating and cooling sector.
Realization:	09/2017 – 02/2023, project currently suspended
Coordinator:	Martin Vestenický, (EF-KMaIKT)
Co-operators:	Peter Vestenický

Other National Research Projects

IBM-10/2016: Exploration of Smart City Services with IBM within UNIZA Campus	
Summary:	The aim of the project is to follow up the IOT activities within UNIZA Campus, bring new solutions & innovations and help more students to get familiar with IBM technology in this area (IOT, BigData, Analysis). It will also deepen the relation between IBM and UNIZA.
Realization:	10/2016 – 10/2018
Coordinator:	Peter Holečko
Co-operators:	Aleš Janota, Juraj Spalek

Other National Non-research Projects

HOOP – a playful form of OOP education for middle school teachers	
Summary:	The project focuses on a change of the Informatics course curricula at the secondary schools and a preparation of informatics teachers for OOP education, specifically in JAVA and Greenfood and BlueJ environments.
Realization:	09/2016 – 09/2018
Coordinator:	Michal Varga
Co-operators:	Alžbeta Kanáliková

Submitted Proposals of International Research Projects in 2017

Type / call	Project title	Outcome of evaluation
H2020/ WIDESPREAD-05-2017	Low Energy Machine Learning for Industry 4.0 Applications (LeMa4.0), CSA Coordination and support action (Aleš Janota, Michal Gregor)	under evaluation

Outputs from Solved Research Tasks

Publication activities at the FEE (based on registration at the University Library up to February 2018)

Kategória	Názov kategórie (podľa UK)	Počet
AAA		

Komentár od [P1]: Nová tabuľka, nevypĺňať, pripraví dekanát za celú EF podľa evidencie v Univerzitnej knižnici

AAB		
ACA		
ACB		
ADC		
ADD		
ADE		
ADF		
ADM		
ADN		
AEC		
AED		
ADE		
ADF		
AGJ		
BCI		
...		

Monographs

[1]	PRIEZVISKO, Meno – PRIEZVISKO, Meno: *Názov publikácie*, vydavateľstvo, rok vydania, ISBN, počet strán. (jazyk)…
[2]	NAISBITT, John – ABURDENOVÁ, Patricia: *Megatrends 2000*, Žilina: EDIS, 2012 ISBN 80-xxxx-xxxx-x, 325 pp. (in Slovak)

Books and textbooks

[1]	PRIEZVISKO, Meno – PRIEZVISKO, Meno: *Názov publikácie*, vydavateľstvo, rok vydania, ISBN, počet strán. (jazyk)
[2]	NAISBITT, John – ABURDENOVÁ, Patricia: *Megatrends 2000*, Žilina: EDIS, 2012 ISBN 80-xxxx-xxxx-x, 325 pp. (in Slovak)

Lecture Notes

[1]	Analogicky
[2]	…

Current Content Journals

[1]	PRIEZVISKO, Meno – PRIEZVISKO, Meno: Názov článku, In: *Názov časopisu*, Vol. 38, No. 1, 2012, ISSN XXXX-XXXX, p. 1059-1074. (Jazyk)
[2]	ŠIKULA, Milan – ŠIKULOVÁ, Jana: Critical threshold of reasonability and economic reform. In: *Acta Physica*, Vol. 38, No. 1, ISSN XXXX-XXXX, p. 1059-1074. (in English)

Patents, Industrial Designs, Author's Certificates and Discoveries

Submitted in 2017:

[1]	Analogicky, uvádzať: Category: Application number: Date of publication of the application: Available to the public:

	Authors:
	Title:
	Granted by the office:
[2]	…

Granted in 2017:

[1]	Analogicky, uvádzať: Category: Application number: Date of publication of the application: Available to the public:)]Authors: .]Title: Granted by the office:
[2]	…

Co-operation

Co-operation Partners in Slovakia

- ABB, s.r.o. Banská Bystrica
- Aliga, s.r.o. Martin
- AP Signaling, s.r.o., Martin
- Avekol, s.r.o. Žilina
- AŽD Slovakia, Bratislava
- B+R automatizace, s.r.o. Nové Mesto nad Váhom
- Betamont, s.r.o. Zvolen
- Continental Matador Rubber, s.r.o., Púchov-Horné Kočkovce
- Department of cybernetics and artificial intelligence, FEI TU Košice
- ELTODO SK, s.r.o. Bratislava
- FMach, s.r.o., Žilina
- IBM Slovensko, Bratislava
- Institute of robotics and cybernetics, FEI STU Bratislava
- National highway company, Bratislava
- PPA INŽINIERING, s.r.o., Bratislava
- Scheidt & Bachmann Slovensko s. r. o., Žilina
- Siemens s. r. o., CEE RU-SK IC-MOL RA RA-COC
- Siemens s.r.o., Digital Factory/ Factory Automation/ Automation systems (IA&DT)
- SIMAP SK, s.r.o. Trenčín
- SOITRON, s.r.o., Bratislava
- ŽSR, Bratislava

International Co-operation Partners

- ALTPRO, d.o.o., Zagreb, Croatia
- AŽD Praha s.r.o., Prague, Czech Republic
- První SaZ Plzeň a. s., Czech Republic

Non-contractual Cooperation with Academic Institutions

- Laboratory for Automation and Robotics, University of Patras, Greece
- Budapest University of Technology and Economics, Hungary
- University of West Bohemia, Pilsen, Czech Republic
- FD ČVUT Prague, Czech Republic
- FEI STU Bratislava
- FEI VŠB -TU Ostrava, Czech Republic
- FEI TUKE Košice
- MTF STU Bratislava, detached in Trnava

Visitors to the Department

Name	Institution	Length of stay
Jerzy Mikulski	Uniwersytet Ekonomiczny w Katowicach, Poland	3 days
Andzej Bialoń	Instytut kolejnictwa Warszawa, Poland	2 days
Ondřej Přibyl	ČVUT, Faculty of Transportation Sciences, CR	3 days
Peter P. Groumpos	Laboratory for Automation and Robotics, University of Patras, Greece	5 days
Marek Tyr	První SaZ Plzeň a. s., CR	3 days
Hrvoje Horvat	ALTPRO d.o.o., Zagreb, Croatia	
Anna Baranová	Continental AG, Germany	2 days
Viktor S. Gurov (rector RSREU)	Ryazan State Radio Engineering University, Ryazan, Russian Federation	3 days
Dmitrij A. Perepelkin	Ryazan State Radio Engineering University, Ryazan, Russian Federation	3 days
Natalya Y. Tesenina	Ryazan State Radio Engineering University, Ryazan, Russian Federation	3 days
Michal Řepka	VŠB – TU Ostrava, CR	1 day
Roman Danel	VŠB – TU Ostrava, CR	1 day

Visits to Foreign Institutions

Name	Institution	Length of stay
Aleš Janota	UTH Radom, Poland	5 days
Aleš Janota	VŠB-TU Ostrava, CR	1 day
Peter Holečko	SLORD, Brussels, Belgium	3 days
Michal Gregor	Laboratory for Automation and Robotics, University of Patras, Greece	5 days
Karol Rástočný	AŽD Olomouc, CR	1 day
Karol Rástočný	Western Czech university in Pilsen, CR	3 days
Karol Rástočný	TST 2016, Ustroń, Poland	4 days
Vojtech Šimák	Ryazan State Radio Engineering University, Russian Federation	3 days
Rastislav Pirník	ČVUT, Faculty of Transportation Sciences, CR	4 days

Contracts (Business Activities)

KS0138/2016: Report on the design of XCom communication solution – GP JAZZ concept

Customer:	AŽD Prague s. r. o., Czech Republic
Coordinator:	Mária Franeková

SOD 007/18/40: Analytical works related with the technical safety solution of GP JAZZ

Customer:	AŽD Prague s. r. o., Czech Republic
Coordinator:	Karol Rástočný

A2 202 16: Safety appraisal of railway crossing safety device type PZZ-K

Customer:	První SaZ Plzeň a. s., Czech Republic
Coordinator:	Karol Rástočný

S-103-0002/2017: Development of program for the MA-001 corrugator

Customer:	Heliostech s. r. o.
Coordinator:	Jozef Hrbček

Other Activities

Conferences, Workshops, Symposiums Organized by the Department

- „Current information on the education area at technical universities ", seminar co-organised with the Association for employment of women in science and technology in Slovakia, 25.10.2017, Žilina, guarantee: Aleš Janota.
- Road tunnels technological equipment: project – realisation – operation – maintenance. 4.4.2017, AB 117, organiser: Juraj Spalek
- Tunnel simulator at UNIZA – properties and usage, 6.9.2017, AB 205, organiser: Juraj Spalek

Specialised Lectures and Courses Organized by the Department

Cryptography and its practical utilisation

Customer:	Lecture for the students of Automation study programme (subject: Communication security)
Lecturer:	Martin Šuták, Aliga, s. r. o. Martin
Date:	12th December 2017

Digital enterprise

Customer:	Lecture for the students of Automation study programme
Lecturer:	Marián Filka
Date:	23rd November 2017

New generation technologies

Customer:	Lecture for the students of Automation study programme
Lecturer:	Michal Bors, Ján Žabka, B+R Automatizace s. r. o.
Date:	14th November 2017

A concept of modern railway interlocking systems by Siemens	
Customer:	Lecture for 2nd degree students of the Process control programme
Lecturer:	Rastislav Kušpál, Siemens s.r.o., Žilina
Date:	22nd November 2017

Motor control	
Customer:	Experimental exercises for the students of the Jozef Murgaš industrial secondary school
Lecturer:	Jozef Hrbček
Date:	12th April 2017

Biometry	
Customer:	Lecture for the students of the Process control programme
Lecturer:	Roman Danel, HGF VŠB-TU Ostrava, CR
Date:	3rd April 2017

Distributed control system for humanoid robot	
Customer:	Lecture for the students of the Process control programme
Lecturer:	Michal Řepka, HGF VŠB-TU Ostrava, CR
Date:	20th April 2017

Artificial intelligence	
Customer:	Popular lecture for the students of Private gymnasium, Oravská cesta, Žilina
Lecturer:	Michal Gregor
Date:	20th December 2017

Invited Lectures/Papers

Safety and readiness – basic attributes of a safety system	
Lecturer:	Karol Rástočný
Where:	International conference of railway and communication technology, Vyhne, SR
Date:	27. – 29.03.2017

Safety technology at DCIS – pedagogical and research activities	
Lecturer:	Karol Rástočný
Where:	Seminar for the current problems of safety technology in transport XII, Pilsen, CR
Date:	31.05.2017

Technological equipment of town tunnels	
Lecturer:	Rastislav Pirník
Where:	ČVUT Faculty of transport, CR
Date:	18.04.2017

Operational states and technological equipment of tunnels	
Lecturer:	Rastislav Pirník
Where:	ČVUT Faculty of transport, CR
Date:	18.04.2017

Membership in International Institutions/Committees

Membership of the Department in international organizations	Membership since
Slovak society for cybernetics and informatics at SAV (SSKI)	2000
Association for transport telematics, CR	2007

Individual membership of employees of international organizations		Function
Aleš Janota	Polish Academy of Sciences (PAN) – Transportation Committee, Katowice, Poland	member
Aleš Janota	International Institute of Informatics and Systemics, USA	member
Aleš Janota	Association for Computing Machinery (ACM), USA	member
Rastislav Pirník	Cooperative systems (SDT), CR	member of workgroup

Individual membership of employees in scientific committees of international journals		Function
Mária Franeková	International scientific journal Archives of Transport System Telematics, ISSN 189-8208, Poland	member of editorial board
Mária Franeková	International scientific Journal of Scientific and Applied research, ISSN 1314-6289, Bulgaria	member of editorial board
Mária Franeková	International scientific journal for electrical engineering Elektrorevue, ISSN 1213-1539, CR	member of editorial board
Mária Franeková	International scientific journal Advances in Electrical and Electronic Engineering, CR, ISSN 1804-3119	member of editorial board
Aleš Janota	Archives of Transport System Telematics, ISSN 1899-8208, Poland	chair of scientific board
Aleš Janota	TransNav International Journal on Marine Navigation and Safety of Sea Transportation, ISSN 2083-6473, Poland	member of programme board
Karol Rástočný	Archives of Transport System Telematics, Polish Association of Transport Telematics, ISSN 1899-8208, Poland	member of editorial board
Karol Rástočný	Advances in Electrical and Electronic Engineering, ISSN 1804-3119, CR	member of editorial board
Karol Rástočný	Wspolczesne systemy transportowe, ISSN 2449-7851, Poland	member of editorial board
Juraj Spalek	Annals of Faculty Engineering Hunedoara – Journal of Engineering, ISSN 1584-2665, ISSN 1584-2673, indexed in Index Copernicus – Journal Master List, Romania	member of editorial board
Juraj Spalek	Acta Technica Corviniensis – Bulletin of Engineering, e-ISSN: 2067-3809, Edited by Faculty of Engineering Hunedoara University Politehnica Timisoara, Romania	member of scientific board
Juraj Ždánsky	Archives of Transport System Telematics, Polish Association of Transport Telematics, ISSN 1899-8208, Poland	member of programme board
Michal Gregor	Applied Computer Science, ISSN 2353-6977	member of

		scientific board

Individual membership of employees in the scientific committees of international conferences		**Function**
Mária Franeková	17th International conference Transport Systems Telematics (TST2017), April 05-08, 2017, Katowice-Ustroń, Poland	member of programme board
Aleš Janota	17th International conference Transport Systems Telematics (TST2017), April 05-08, 2017, Katowice-Ustroń, Poland	member of programme board
Aleš Janota	12th International Conference on Marine Navigation and Safety of Sea Transportation (TransNav 2017), June 21-23, 2017, Gdynia, Poland	member of scientific - programme board
Aleš Janota	XXI. International Conference TransComp, December 4-7, 2017, Zakopané, Poland	member of scientific board
Aleš Janota	15th International Symposium on Applied Machine Intelligence and Informatics (SAMI 2017), January 26-28, 2017, Herľany, Slovakia	member of programme board
Karol Rástočný	17th International conference Transport Systems Telematics (TST2017), April 05-08, 2017, Katowice-Ustroń, Poland	member of programme board
Karol Rástočný	23rd International Conference on Applied Electronic (AE 2017), September 05–06, 2017, Pilsen, Czech Republic	member of programme board
Karol Rástočný	6th International Conference Advanced Rail Technologies (ART 2017), November 15–16, 2017, Warsaw, Poland	member of programme board
Karol Rástočný	12th International scientific conference of young scientists, Ph.D. students and their tutors TRANSCOM, May 31, 2017- June 02, 2017, High Tatras, Slovakia	member of programme board
Karol Rástočný	13th International conference on railway communication and safety technology (ŽOZT), March 27-29, 2017, Vyhne, Slovakia	member of programme board
Juraj Spalek	17th International conference Transport Systems Telematics (TST2017), April 05-08, 2017, Katowice-Ustroń, Poland	member of honorary board
Juraj Spalek	XII-th International Scientific and Technical Conference Computer Science and Information Technologies, September 05-08, 2017, Lviv, Ukraine	member of programme board
Juraj Spalek	15th International Symposium on Applied Machine Intelligence and Informatics (SAMI 2017), IEEE, January 26-28, 2017, Herl'any, Slovakia	member of programme board
Juraj Spalek	6th International Conference organized by Railway Research Institute and Faculty of Transport of Warsaw University of Technology, November 15–16, 2017, Warsaw, Poland	member of scientific board
Juraj Spalek	12th international scientific conference of young scientists, Ph.D. students and their tutors TRANSCOM, May, 31, 2017-June –02, 2017, High Tatras, Slovakia	member of scientific board in the ICT section
Juraj Ždánsky	17th International conference Transport Systems Telematics (TST2017), April 05-08, 2017, Katowice-Ustroń, Poland	member of scientific board
Rastislav Pirník	Automation and control in theory and practice (ARTEP 2017), February 15-17, 2017, Stará Lesná, Slovakia	member of programme board
Marián Hruboš	12th international scientific conference of young scientists, Ph.D. students and their tutors TRANSCOM, May 31, 2017- June 02, 2017, High Tatras, Slovakia	member of organising board
Marián Hruboš	55th International Conference on Experimental Stress Analysis, (EAN 2017), May 30 - June 1, 2017, Nový Smokovec, Slovakia	member of organising board
Marián Hruboš	8th international conference: Technology forum – Špindlerův	member of

	mlýn 2017, June 27-29, 2017, Špindlerův Mlýn, Czech Republic	organising board
Jozef Hrbček	12th international scientific conference of young scientists, Ph.D. students and their tutors TRANSCOM, May 31, 2017- June 02, 2017, High Tatras, Slovakia	member of organising board
Michal Gregor	8th international conference: Technology forum – Špindlerův mlýn 2017, June 27-29, 2017, Špindlerův Mlýn, Czech Republic	member of organising board
Michal Gregor	55th International Conference on Experimental Stress Analysis, (EAN 2017), May 30 - June 1, 2017, Nový Smokovec, Slovakia	member of organising board

Individual membership of employees in scientific boards and trade committees abroad		Function
Peter Vestenický	VŠB-TU Ostrava, HGF, CR	member of branch committee

Membership in National Institutions/Committees

Membership of the Department in organizations of the SR	Membership since
Slovak society for cybernetics and informatics at SAV (SSKI)	2000

Individual membership of employees in organizations of the SR		Function
Mária Franeková	Technical standardisation committee TK 83 railway applications, SÚTN Bratislava	member
Mária Franeková	Profibus.sk association, FEI STU Bratislava	member
Mária Franková	Slovak society for cybernetics and informatics at SAV (SSKI), SR	member of main board
Aleš Janota	National robotics centre, Bratislava	honorary member
Aleš Janota	Scientific-technical association at UNIZA, Žilina	member
Aleš Janota	Technical standardisation committee TK104 Control of industrial processes, Slovak office of standards, metrology and testing, Bratislava	member
Aleš Janota	Slovak society for cybernetics and informatics at SAV (SSKI), SR	member of main board
Karol Rástočný	Technical standardisation committee TK 83, SÚTN Bratislava	member
Juraj Spalek	Scientific-technical association at UNIZA, Žilina	member
Juraj Spalek	National robotics centre at FEI STU Bratislava, SR	honorary member
Juraj Spalek	Slovak society for cybernetics and informatics at SAV (SSKI), SR	member of main board
Juraj Spalek	Slovak road society, Bratislava	member of eSafety workgroup

Individual membership of employees in editorial boards of national journals	Function

Karol Rástočný	AT&P Journal, ISSN 1335-2237	member of editorial board
Juraj Spalek	AT&P Journal, ISSN 1335-2237	member of editorial board
Rastislav Pirník	Acta Technología, ISSN 2453-675X	member of editorial board

Individual membership of employees in scientific boards and trade committees outside of FEE UNIZA		Function
Mária Franeková	Branch committee study programme 5.2.14 Automation at MTF, STU Bratislava	member
Aleš Janota	Branch committee study programme 9.2.9 Applied informatics, Faculty of management and informatics, UNIZA, Žilina	member
Emília Bubeníková	Scientific-technical association at UNIZA, Žilina	member
Juraj Spalek	Scientific Board FSI UNIZA, Žilina	member
Juraj Spalek	Branch committee study programme 9.2.9 Applied informatics, Faculty of management and informatics, UNIZA, Žilina	member
Juraj Spalek	Accreditation committee of MŠVVŠ SR	member of OV16 workgroup

Awards

KRIS on behalf by Juraj Spalek	Memorial letter of the Department of multimedia and ICT for the occasion of 50th anniversary of its foundation for a long-term cooperation.

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