DEPARTMENT OF CYBERNETICS AND ARTIFICIAL INTELLIGENCE

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Head of Department
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1 DEPARTMENT'S PROFILE

The Department (DCAI) is responsible for education in the following bachelor study programs: Cybernetics, Intelligent Systems, and Business informatics; in the following master study programs: Cybernetics and Information-Control Systems, Artificial Intelligence, Business Informatics; and following PhD-study programs: Cybernetics, Artificial Intelligence, and Business Informatics.

The main research topics at the Department are intelligent methods and algorithms for control and modeling of large-scale systems; risk-sensitive diagnosis of uncertain systems; computational intelligence techniques for modeling of intelligent systems and miscellaneous applications; intelligent decision support systems; pattern recognition; knowledge discovery; knowledge technologies for information retrieval and knowledge management; and computational and cognitive neuroscience.

The predecessor of the Department was founded in 1964. Department of Cybernetics and Artificial Intelligence was adapted in 1989. Currently it has 24 staff

members, 25 internal and 12 external Ph.D. students. There are 3 sections within the department: Cybernetics and Automation, Artificial Intelligence, and Business Informatics. Within the Department there are active two research Centers: Centre for Cybernetics (http://cybernetics.fei.tuke.sk/cybervirtlab/) and Centre for Intelligent Technologies (www.ai-cit.sk).

The Department is involved in a number of research and educational projects. The following types of projects were under way in 2010: 2 European IST projects, 1 Socrates thematic network, 1 US National Institutes of Health research project, 6 grants awarded by Science Grant Agency, 1 grant awarded by the Slovak Research and Development Agency Project, 3 grants awarded by Cultural and Educational Grant Agency, 3 other international grants and 1 project supported by the Research & Development Operational Programme funded by the ERDF.

2 STAFF

Professors:
prof. Ing. Dušan Krokavec, CSc.
Dr.h.c. prof. Ing. Ladislav Madarász, CSc.
prof. RNDr. Eva Ocelíková, CSc.
prof. Ing. Tomáš Sabol, CSc.
prof. Ing. Ján Sarnovský, CSc.
prof. Ing. Peter Sinčák, CSc.
prof. Ing. Iveta Zolotová, CSc.

Associate Professors:
doc. Ing. Anna Filasová, CSc.
doc. Ing. Anna Jadlovská, PhD.
doc. Ing. Ján Jadlovský, CSc.
doc. Ing. Norbert Kopčo, PhD.
doc. Ing. Marián Mach, CSc.
doc. Ing. Kristína Machová, CSc.
doc. Ing. Ján Paralič, PhD.
doc. Ing. Zoltán Tomori, PhD.

Assistant Professors:
Ing. Rudolf Andoga, PhD.
Ing. František Babič, PhD.
Ing. Karol Furdík, PhD.
Dr. Ing. Vratislav Hladký
Ing. Rudolf Jakša, PhD.
Ing. Ján Liguš, PhD.
Ing. Martin Sarnovský, PhD.
Dr. Ing. Ján Vaščák

Researchers:
Ing. Marián Bučko, CSc.
Ing. Marek Duľa
Ing. Ladislav Fözö, PhD.
Ing. Stanislav Laciňák, PhD.
Ing. Ladislav Takáč, PhD.
Ing. Beáta Tomoriová

Technical Staff:
Imrich Balogh
Mária Feješová
Tatiana Baňasová

Ph.D. Students:

1st.	**Internal**	**External**
	Ing. Matej Čopík	Ing. Peter Balogh
	Ing. Štefan Jajčišin	Ing. Miroslav Fuhrman
	Ing. Mgr. Peter Koncz	
	Ing. Roman Mihaľ	
	Ing. Adela Tušanová	
	Ing. Mária Virčíková	
2nd.	**Internal**	**External**
	Ing. Daniel Gontkovič	Ing. Stanislav Dvorščák
	Ing. Rastislav Hošák	Ing. Peter Kubičko
	Ing. Ján Ilkovič	
	Ing. Tomáš Karoľ	
	Ing. Gabriel Lukáč	
	Ing. Miloš Pavlík	
	Ing. Martin Repka	
	Ing. Peter Smolár	
	Ing. Peter Šuster	
	Ing. Attila Török	
	Ing. Jaroslav Tuhársky	
3rd.	**Internal**	**External**
	Ing. Zlatko Fedor	Ing. Tomáš Gášpár
	Ing. Michal Hladký	Ing. Ľuboš Lörinc
	Ing. Vladimír Jeleň	Ing. Marián Onder
	Ing. Peter Karch	Ing. Marián Stanislav
	Ing. Ján Kažimír	
	Ing. Gabriel Tutoky	
	Ing. Lucia Vaľová	
	Ing. Jozef Wagner	
4th.		**External**
		Ing. Juraj Koščák
		Ing. Jozef Kováč
		RNDr. Marcel Kudláč
		Ing. Kvetoslav Molitoris

3 LABORATORIES

- Centre for Intelligent Technologies: Laboratory of Autonomous Systems (LAS-CIT), Laboratory of Humanoid Robots (LHR-CIT) http://www.ai-cit.sk
- Centre of Cybernetics (L-513) http://cybervirtlab.fei.tuke.sk/CyberVirtLab/, http://web.tuke.sk/kybernetika/labaky/L513/
- Laboratory of Intelligent Information and Control Systems (L-535), http://web.tuke.sk/kybernetika/labaky/L535.html
- Laboratory of Distributed Control Systems - ROCKWELL AUTOMATION LABORATORY (L-536), http://web.tuke.sk/kybernetika/labaky/L536.html
- Laboratory of Intelligent Control Networks (L-509),

http://web.tuke.sk/kybernetika/labaky/L509.html

- Laboratory of Speech and Pattern Recognition (V-147)
- Perception and Cognition Laboratory (V-31) http://pcl.tuke.sk
- Laboratory of Knowledge Technologies (V-101a) http://web.tuke.sk/kybernetika/labaky/V101a.html
- Laboratory of One-Chip-Computers (V-101b)
- Laboratory of intelligent control systems of aircraft engines (in cooperation with Faculty of Aeronautics)

4 TEACHING

4.1. Undergraduate Study (Bc.)

Subject	Semester	Lectures/exercises (hours per week)	Name of lecturer
Introduction to Business Informatics	1st	1/2	Paralič, J.
Computers and Algorithms	2nd	2/2	Jadlovská, Jadlovský
Office Information Systems	2nd	1/2	Zolotová
Elements of Control Systems	2nd	2/2	Hladký
Artificial Intelligence	2nd	2/2	Machová, Paralič
Simulation systems in Business Informatics	2nd	2/2	Jadlovská, Hladký
Foundations of Automatic Control	3rd	2/2	Madarász
Simulation Systems	3rd	2/2	Jadlovská
Artificial Intelligence	3rd	2/2	Sinčák, et al.
Knowledge-Based Systems	3rd	2/2	Machová
Applications of Operation Systems in Management	3rd	2/2	Liguš
Application Programming	3rd	2/2	Jakša
Control of Technological Processes	4th	2/2	Liguš
Control and Visualization Systems	4th	2/2	Zolotová
Identification and Modeling	4th	2/2	Filasová
Linux I.	4th	2/2	Jakša
Computer Tools for Technological Systems Control	4th	2,2	Jadlovský
Applications of Artificial Intelligence	4th	0/2	Sinčák
Scheduling and Logistics	4th	2/2	Paralič
Application programming	4th	0/2	Jakša
Computer (Based) Control	5th	2/2	Krokavec
Database Management System Applications	5th	2/2	Ocelíková
Protocols and Interfaces	5th	2/2	Jadlovský
Project Management	5th	2/2	Sabol
Introduction to Neurosciences	5th	2/2	Kopčo
Cybernetics and Management	6th	2/2	Sarnovský
System Analysis and Synthesis	6th	2/2	Madarász
Introduction to Non-linear Systems	6th	2/2	Jadlovská
Effective and financial management	6th	2/2	Bučko
Heuristic Optimization Processes	6th	2/2	Mach

4.2. Graduate Study (Ing.)

Subject	Semester	Lectures/exercises (hours per week)	Name of lecturer
Optimal and Adaptive Control Theory	1st	2/2	Sarnovský
Computer Vision	1st	2/2	Tomori
Intelligent Control Systems	1st	2/2	Liguš
Knowledge Management	1st	2/2	Paralič, J.
Information Systems for Business Processes	1st	2/2	Zolotová
Discrete-time Systems	1st	3/2	Krokavec, D.
Theoretical Foundations of Artificial Intelligence	1st	2/2	Sinčák
Symbolic Artificial Intelligence	1st	2/2	Mach
IT Environment Control	1st	2/2	Sarnovský M., Furdík
Online Identification	1st	2/2	Krokavec
Logic Control	1st	2/2	Liguš
Distributed Control Systems	2nd	2/2	Jadlovský
Control and Artificial Intelligence	2nd	2/2	Jadlovská
Robust Control	2nd	2/2	Filasová
Evolutionary Algorithms	2nd	2/2	Mach
Multicriterial Decision Making	2nd	2/2	Ocelíková
Machine Learning	2nd	2/2	Machová
Logic Programming	2nd	1/1	Paralič
Stochastic Systems	2nd	2/2	Krokavec, D.
Fuzzy Decision	2nd	2/2	Vaščák
Complexity and Decision Making	2nd	2/2	Madarász
Engineering econometrics	2nd	2/2	Krokavec
Speech Recognition	2nd	2/2	Krokavec, D.
Intelligent Sensor Systems	2nd	2/2	Krokavec, D.
Interactive Systems	2nd	2/1	Jakša
Integrated manufacturing systems	3rd	3/2	Madarász
Humanoid Technologies	3rd	2/2	Jakša
Dynamic Systems Diagnostics	3rd	2/2	Krokavec, D.
Complex Systems Control	3rd	2/2	Hladký
LISP Applications	3rd	0/2	Mach
Management Information Systems	3rd	2/2	Jadlovský
Complexity and Decision Making	3rd	2/2	Madarász
Semantic Technologies	3rd	2/2	Machová
Neuro-fuzzy Systems	3rd	2/2	Vaščák
Cybernetics	3rd	2/2	Sarnovský
Knowledge Discovery	3rd	2/2	Paralič
Philosophic Problems of Cybernetics and AI	4th	2/2	Sarnovský
Repetition of AI Foundations	4th	0/2	Sinčák
AI Applications Seminar	4th	2/2	Sinčák

5 RESEARCH PROJECTS

- ***Knowledge Practices Laboratory (KP-Lab)*** is an integrated project funded by the European Commission within the IST Program (6th Framework Program) IST-2000-29207, coordinator: University of Helsinki. Duration:

2006-2011, Team members from DCAI: Ján Paralič (team leader), František Babič, Peter Bednár, Karol Furdík, Jozef Wagner, Gabriel Tutoky. Activity: KP-Lab is an ambitious project that focuses on developing a learning system aimed at facilitating innovative practices of sharing, creating and working with knowledge in education and workplaces. KP-Lab presents a unifying view of human cognition. It is based on the assumption that learning is not just individual knowledge acquisition or social interaction, but shared efforts of transforming ideas and social practices. The objective of the KP-Lab project is to develop theories, tools, and practical models to elicit deliberate advancement and the creation of knowledge, as well as the corresponding transformation of knowledge practices in education and workplaces. The essential way of developing the collaborative technologies is through a co-evolutionary process involving researchers, technological developers and users. Web page: http://www.kp-lab.org

- ***HYDRA (IST-2005-034891)**, Networked embedded system middleware for heterogeneous physical devices in a distributed architecture*, is a research project funded by the European Commission within the IST Program (6th Framework Program, IP). Team members from DCAI (in cooperation with the Faculty of Economics): Tomáš Sabol, Marián Mach, Peter Butka, Martin Sarnovský. Duration: 2006-2010. Activity: The aim of the project is to research, develop and validate middleware for networked embedded systems that allows developing cost-effective, high-performance ambient intelligence applications for heterogeneous physical devices, and a software development kit enabling developers to develop innovative applications based on the middleware. Web page: http://www.hydramiddleware.eu/news.php
- ***Multiagent networked control with automatic reconfiguration*,** Scientific Grant Agency project No. 1/0617/08, duration: 2008 – 2010, members: Ján Sarnovský (project leader). Activities: The scientific project Multiagent networked control with automatic reconfiguration has a goal to research, develop and implement the algorithms and control methods of the individual networked control elements, whose interconnections are realized by communication networks using the principles and methods of artificial intelligence. The project main focus is on the control algorithms as well as on the behavioral algorithms of the networked control elements with so called Plug and Play network functionality. By the modeling the networked control systems as the multiagent system and by the process formalization will be created the concrete algorithms for its automatic configuration and reconfiguration in the network environment with their consequences implementation inn the physical laboratory conditions in the area of mobile robotics and other models.
- ***Methods for reconfigurable control systems design***, Scientific Grant Agency project No. 1/0328/08, duration: 2008 – 2010, members: Dušan Krokavec (project leader), Filasová Anna, Hladký Vratislav, Liguš Ján, Kocsis Pavol. Activities: The project Design of reconfigurable control systems is focused on the fault-tolerant control systems. The basic research is a fundamental part of the project and is undertaken in the specific areas of model based fault detection and isolation, control system reconfiguration, as well as robust control of parametrically uncertain linear dynamic systems in reconfigurable structures. The focal scientific points of the project are in the development of new integrated methods and algorithms to design a

stability guaranteed fault-tolerant control structure with active reconfiguration; the terminal scientific objectives are the application-oriented computational methods for residual evaluation, the sophisticated reconfigurable schemes with explicit consideration of system performance degradation, as well as the appropriate procedures associated with interacting multiple control structures and the residual evaluation (decision making) strategy in reconfigurable control.

- ***Methods and Tools of Intelligent and Information Technologies for object Recognition and Classification***. Scientific Grant Agency project No. 1/0386/08, duration: 2008 – 2010, members: Eva Ocelíková (project leader), Iveta Zolotová, Jana Výrostková, Marián Bučko, Erna Demjénová, Marián Bakoš, Oľga Duľová, Peter Karch. Activity: Project focuses on design of new and modified methods and tools in decision support systems with emphasis on pattern recognition. It includes integrated chain of tasks starting with data acquisition, pre-processing and storing of input data, throughout knowledge discovery, to its presentation into decision making link in a suitable user interface. The attention will be focused on selection of informative features for decision on methods of object classification and composite classifiers. From latest information technologies, emphasis will be put on internet technology. Project implements theoretical-experimental analysis and integration of tools into the application areas for control of technological processes (situation control, SCADA/HMI systems, intelligent control and information systems), for ecology (remotely sensed data) and for medicine (cardiovascular illnesses, bio-medical images).
- ***Situational control algorithms and large scale systems modeling***, Scientific Grant Agency project No. 1/0394/08, duration: 2008 – 2010, members: Ladislav Madarász (project leader), members: Andoga Rudolf Ing. PhD, Főző Ladislav, Ing, PhD., Modrovičová Jana, Ing., Bučko Marian Ing. CSc., Adamčík František doc. Ing. CSc. (Faculty of Aeronautics), Považan Jozef prof. Ing. CSc. (Faculty of Aeronautics), Lazar Tobiáš prof. Ing. DrSc. (Faculty of Aeronautics), Hocko Marián Ing. PhD. (Faculty of Aeronautics), Kabát Ján Ing. (Faculty of Aeronautics), Piľa Ján Ing. PhD. (Faculty of Aeronautics), Kolesár Ján Ing. PhD. (Faculty of Aeronautics), Judičák Jozef, Ing. (Faculty of Aeronautics). Activities: Nowadays, the area of technical systems is mainly focused to satisfy the demands for safety, quality and efficiency. Among the growing complexity of present systems, it is necessary to project such systems that will take all the three mentioned contrary demands into account. These facts bring us to a task of precision modeling of such systems and following design of progressive methods of their control. One of the efficient approaches in this area is also the methodology of situational control based on situational classification of operational states of a system designed as a general set of approaches to large scale systems control. This approach nowadays expects use of modern knowledge from the areas of artificial intelligence, modeling and control. Special attention will be put also to particular application results and their technical realization. In the area of large scale systems modeling, the emphasis will be put on creation of high precision models in an integrated virtual environment.
- ***Methods for identification, annotation, search, access and composition of services using semantic metadata in support of selected process types***, Scientific Grant Agency project No. 1/0042/10, duration: 2010 –

2011, members: Marian Mach (project leader), Paralič Ján, Babič František, Furdík Karol, Sarnovský Martin, Wagner Jozef, Machová Kristína, Lukáč Gabriel. Activities: The project is focused on using semantic metadata to describe services in a way suitable for semantic processing. Activities will target mainly the importance of semantics within different phases of service life-cycle – from identifying services in processes and describing them through searching and accessing services to composing services into workflows. Attention will be paid to different service types including web services, services provided by human actors or electronic devices, and grid services. In connection with services, the project focuses on specific process types. One of these process types is text mining remarkable by considerable time complexity and strong dependence on employed data sets. Another process type is represented by new knowledge creation processes characterised by an occurrence of implicit knowledge practices. The last type of processes, the realisation of workflows in a grid environment, strongly depends on a distribution of tasks among available processing nodes.

- ***Learning systems based on computational intelligence***, Scientific Grant Agency project No. 1/0885/08, duration: 2008 – 2010, members: Peter Sinčák (project leader)
- ***DNA-CT - Fluorescent image analysis of irregularly shaped cells for purposes of non-destructive DNA quantification***, Slovak Research and Development Agency Project, No. APVV-0682-07, members: Iveta Zolotová (project leader for DCAI group), Peter Karch, Vladimír Jeleň, Oľga, Duľová, Zoltán Tomori (project leader of whole project from group of Institute of Experimental Physics SAS Košice), Marek Dudáš (project leader of group of Safarik University of Kosice), duration: 2008-2010. Activity: Adaptation of microscope for capturing of immobilized sperm cell images under different angles of view. Design of 3D mathematical model adjusting the acquired image with respect to both the angle of cell rotation and the physical conditions during acquisition. Statistical comparison of DNA contents values obtained under different condition.
- ***Utilisation of intelligent methods for control and modeling of aircraft engines in educational process***, Cultural and Educational Grant Agency project No. 001 – 010 TUKE4/2010, duration: 2010-2012, project leader: Ladislav Madarász. The aim of the project is to create a platform for the use of small turbojet engines in the Laboratory of Intelligent control systems of aircraft engines outside the frame of the ongoing research for educational purposes. This project will be oriented on the following areas of education: the area of digital acquisition of operating parameters of the engine in real-time, the area of basic analysis and visualization of the obtained data, visualization and creation of basic models and demonstration of control algorithms. Because the small turbojet engines have similar characteristics as normal engines they are appropriate objects for demonstration of characteristics of real engines, modern methods of measurement of extreme parameters, algorithms of modeling and control.
- ***Cybernetic education center.*** KEGA – Cultural and Education Grant Agency Project No. 037-011TUKE-4/2010, duration 2010 – 2011, members: Iveta Zolotová (project leader), Ján Sarnovský, Eva Ocelíková, Ján Jadlovský, Anna Jadlovská, Vratislav Hladký, Ján Liguš, Jana Ligušová,

Stanislav Laciňák, Ladislav Takáč, Marek Duľa, Ľuboš Popovič, Oľga Duľová, Peter Karch, Richard Lonščák, Rastislav Hošák, Miloš Pavlík, Roman Mihaľ. Activities: The project focuses on creating cybernetic education center, which will promote research and development of education sphere in the Cybernetics and Automation section and related sections within the department, based on the latest technologies. The center will integrate and develop existing education and training portals and distributed laboratories with the objective to achieve synergy effect. It will include functionalities like a modeling and control of real and simulated dynamic systems, accessing electronic educational materials of selected courses from the Cybernetics section or e-testing of students' knowledge. Designed center, especially its brand new central portal, will include also features of adaptive web based on the neural networks with Hebbian learning rules. Project will be compatible with the european project Enhanc-Life-Long-Learning-EIE Community.

- ***Cognitive science – Middle European cross-disciplinary master study program***, Cultural and Educational Grant Agency project No. 3/7300/09, duration: 2009-2011, members: Norber Kopčo, Beata Tomoriová; Jan Rybár, Igor Farkaš, Comenius University Bratislava, Peter Sýkora, University of Constantine and Methodus, Trnava activity: Creation of a joint interdisciplinary Masters program of Cognitive science in collaboration with universities in the central-European region (Vienna, Budapest, Ljubljana, Zagreb).
- ***Perceptual, Contextual, and Cross-Modal Learning in Hearing and Vision***. the European Community's 7FP/2007-13 grant no PIRSES-GA-2009-247543 (Marie Curie program for Research Staff Exchange) PI Norbert Kopčo, staff Rudolf Andoga, Beáta Tomoriová. Collaboration with University of California, Boston University, Martinos Center/Harvard Medical School.
- ***Co-funding grant for Perceptual, Contextual, and Cross-Modal Learning in Hearing and Vision***. Slovak Research and Development Agency Project, No. PP7RP-0027-09. PI Norbert Kopčo, staff Rudolf Andoga, Beáta Tomoriová. Reimbursement grant for the costs of grant preparation for successful applicants for EU research grants.
- ***Centre of information and communication technologies for knowledge-based systems***, project No. 26220120020 supported by the Research & Development Operational Programme funded by the ERDF, duration: 2009 - 2011.

6 CO-OPERATION

6.1. Co-operation in Slovakia

- Department of Automatic Control Systems Bratislava, Slovak University of Technology, Bratislava
- Institute of Intelligent Systems, Faculty of Informatics, Slovak University of Technology, Bratislava
- Institute of Computer Science, Slovak Academy of Sciences in Bratislava
- Department of Biophysics IEP Slovak Academy of Science
- Institute of Computer Science, University of P.J. Šafárik, Košice

- Economic University, Faculty of Business Economics, Košice
- Institute of Experimental Physics, Slovak Academy of Sciences
- Department of applied informatics (Centre for Cognitive Science), Faculty of Mathematics, Physics and Informatics, Comenius University, Bratislava
- Košice self-governing region
- Local Authority City Ward Ťahanovce, Košice
- The City of Košice
- Tatrabanka, a.s.
- IT Valley Kosice

6.2. International Co-operation

- The Open University, Knowledge Media Institute, United Kingdom
- University of Vaasa, Finland
- Helsinki University of Technology, Dipoli, Finland
- Department of Software Engineering and Interactive Systems, Vienna University of Technology, Austria
- University of Regensburg, Germany
- Hearing Research Center and Dept. of Cognitive and Neural Systems, Boston University, USA
- Center for Cognitive Neuroscience and Department of Psychology, Duke University
- Institute of Pathological Physiology, 1st Faculty of Medicine, Charles University, Prague
- Budapest Computational Neuroscience Group, Department of Biophysics, Hungarian Academy of Sciences
- Department of Psychology, University of California at Riverside
- Harvard Medical School – Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Boston, USA
- University of Dortmund, Germany
- Waseda University, Tokyo, Japan
- Technical University of Czestochowa
- Tokyo Institute of Technology, Japan
- Kuyshu Institute of Technology, Japan
- Université Joseph Fourier Grenoble, IUT 1 (Institut Universitaire de Technologie 1), Grenoble, France
- Heudiasyc UMR CNRS 6599, UTC, Compiegne, France
- Université Henri Poincaré, Laboratoire CRAN (Centre de Recherche en Automatique de Nancy), Nancy 1, France
- Department of Informatics, Technical University, Ostrava, Czech Republic
- Department of Control Systems and Instrumentation, Faculty of Mechanical Engineering Technical University of Ostrava, Czech Republic
- Department of Cybernetics, Czech Technical University Prague, Czech Republic
- Department of Control Engineering, Czech Technical University, Prague, Czech Republic
- Institute of Information Theory and Automation, Academy of Sciences of Czech Republic, Prague, Czech Republic
- Department of Information Engineering, Faculty of Economics and Management, Czech University of Agriculture, Prague, Czech Republic

- University of Hradec Králové, Czech Republic
- Faculty of Mechanical Engineering, Department of Automation, Institute of Information, University of Miskolc, Hungary
- Óbuda University, Budapest, Hungary
- Budapest University of Technology and Economics, Hungary
- California Institute of Technology, Jet Propulsion Laboratory (Dr. Antal, K. Bejczy), USA, California
- Hungarian Academy of Sciences, Computer and Automation Research Institute, Hungary (prof. Gyorgy Kovács)
- Regional Association of the Hungarian Academy of Sciences, Miskolc, Hungary
- Austrian Academy of Sciences, Acoustics Research Institute (Bernhard Laback)
- Auditory Neuroscience Group, Department of Physiology, University of Sydney

6.3. Membership in International Organizations and Societies

- Jakša, R.: IEEE, Computational Intelligence Society
- Karch, P.: EAEEIE – European Association for Education in Electrical and Information Engineering
- Kopčo, N.: Association for Research in Otolaryngology, Acoustical Society of America, Society for Neuroscience
- Krokavec, D.: Member of the International Federation of Automatic Control IFAC Technical Committee TC 1.4 Stochastic Systems
- Liguš, J.: EAEEIE – European Association for Education in Electrical and Information Engineering
- Madarász, L.: Doctor honoris causa, University of Miskolc (2009)
- Madarász, L.: Honorary professor, Óbuda University Budapest, Hungary (2009)
- Madarász, L.: Honorary Member of the Board of Hungarian Academy of Sciences (2000)
- Madarász, L.: Chairmanship member of the Technical Section, Association of Hungarian Professors (2001)
- Madarász, L.: Honorary Professor, Bánky Donát Polytechnic, Budapest, Hungary (1999)
- Madarász, L.: Membership of Associate Editors, Acta Polytechnica Hungarica, Budapest Tech, Hungary (2004)
- Madarász, L.: Honorary Membership in Hungarian Fuzzy Association, Budapest Hungary (2002)
- Madarász, L.: American Biographical Institute, Gold Record of Achievement, Control of Large Scale Systems, USA (1997)
- Madarász, L.: The American Biographical Institute, The Research Board of Advisors (1996)
- Madarász, L.: Honorary Fellow of micro'CAD The Univesity of Miskolc (2005)
- Ocelíková, E.; Sinčák, P.; Zolotová, I.: CPRS - Czech Pattern Recognition Society
- Ocelíková, E.: CSSS - Czech and Slovak Society for Simulation
- Machová, K.: ACM – Association of Computer Machinery
- Paralič, J.: ACM – Association of Computer Machinery

- Sabol, T.: Information Society Technologies Program Committee (IST PC), 5th Framework Program, Brussels
- Sarnovský, J.: IEEE
- Sarnovský, J.: INES - International Network of Engineers and Scientists for Global Responsibility
- Sarnovský, J.: Principia Cybernetica Web PRNCYB-L
- Sarnovský, J.: SWIIS - Suplementary Ways for Improving International Stability
- Sinčák P.: European Society of Neural Networks
- Sinčák P.: IEEE, Computational Intelligence Society
- Vaščák, J.: IEEE, Computational Intelligence Society
- Zolotová, I.: IEEE, Education Society
- Zolotová, I.: EAEEIE – European Association for Education in Electrical and Information Engineering

6.4. Membership in Slovak Organizations and Societies

- The whole Department of Cybernetics and Artificial Intelligence is a team member of:
    - Slovak Society for Cybernetics and Informatics
    - Slovak AI Society
- Filasová, A.: Slovak Society for Cybernetics and Informatics
- Krokavec, D.: Slovak Electrical Engineering Society
- Krokavec, D.: Scientific Grant Agency of Slovak Republic
- Krokavec, D.: Member of the Editorial Board of the Journal AT&P, Bratislava
- Madarász, L.: Member of the Editorial Board of the Journal AT&P, Bratislava
- Madarász, L.: Slovak Society for Cybernetics and Informatics
- Madarász, L.: Member of the Editorial Board of the Journal Transfer Inovácií, Faculty of Mechanical Engineering (2006)
- Madarász, L.: Member of the Editorial Board of the Acta Polytechnica Hungarica, Budapest Tech, Hungary (2006)
- Jadlovská, A; Ocelíková, E.; Sarnovský, J.: Slovak Society for Cybernetics and Informatics
- Paralič, J.: Slovak Society for Computer Science
- Sabol, T.: Board of the Open Society Fund, Bratislava
- Zolotová, I.: Slovak Research and Development Agency

6.5. International Networks and Exchange Programs

- EIE-Surveyor, REFERENCE POINT FOR ELECTRICAL AND INFORMATION ENGINEERING IN EUROPE, Project Nr. 225997-CP-1-2005-1-FR-ERASMUS-TNPP, Project funded by the European Commission (SOCRATES Thematic Network), Contact person: Ján Liguš
- Socrates - Erasmus agreement between TU of Košice and University Hradec Kralove, Czech Republic. Contact person: Ján Vaščák
- Socrates - Erasmus agreement between TU of Košice and Czech University of Agriculture, Prague, Czech Republic. Contact person: Eva Ocelíková

7 THESES

Thesis type	Bachelor	Master	Doctoral
Number	117	57	6

8 OTHER ACTIVITIES

- 8th Slovak – Hungarian Joint Symposium on applied Machine Intelligence (SAMI 2010 - http://www.sami.tuke.sk/) has been organized in Herľany, Slovakia, January 28-30

9 PUBLICATIONS

9.1. Books

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[6] Paralič, Ján**:** Scheduling and logistics (in Slovak) 1st edition, Košice: Equilibria, 2010. 93 p. - ISBN 9788089284634.

[7] Paralič, Ján - Furdík, Karol - Tutoky, Gabriel - Bednár, Peter - Sarnovský, Martin - Butka, Peter - Babič, František: Text Mining (in Slovak), 1st edition, Košice: Equilibria, 2010. 183 p. - ISBN 9788089284627.

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[27] Sarnovský, Ján: Summa technologiae. In: AT&P Journal. - ISSN 1335-2237. - Roč. 12, č. 7 (2010), s. 9.
[28] Vaščák, Ján - Madarász, Ladislav: Adaptation of fuzzy cognitive maps – a comparison study. In: Acta Polytechnica Hungarica. - ISSN 1785-8860. - Vol. 7, no. 3 (2010), p. 109-122.

9.3. Other publications

Publication Type	Confereces		Other
	Foreign	Home	
Number	36	70	3