

## DEPARTMENT OF CYBERNETICS AND ARTIFICIAL INTELLIGENCE

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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, Artificial Intelligence, Business Informatics, Automation; and following PhD-study programs: Cybernetics, Artificial Intelligence, Automation, 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, 34 internal and 14 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](http://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 2009: 6 European IST projects (2 integrated projects, 2 STREPs, 1 Network of Excellence and 1 Specific Support Action), 1 Socrates thematic network, 1 US National Institutes of Health research project, 7 grants awarded by Science Grant Agency, 1 grant awarded by the Slovak Research and Development Agency Project, and 1 grant awarded by Cultural and Educational Grant Agency.

## 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.

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

**Technical Staff:** Imrich Balogh  
Tatiana Baňasová  
Mária Feješová

## Ph.D. Students:

1<sup>st</sup>.

### internal

Ing. Daniel Gontkovič  
Ing. Rastislav Hošák  
Ing. Ján Ilkovič  
Ing. Tomáš Karol  
Ing. Gabriel Lukáč  
Ing. Miloš Pavlík  
Ing. Martin Repka  
Ing. Peter Šmolár  
Ing. Peter Šuster  
Ing. Jaroslav Tuhársky

### external

Ing. Stanislav Dvorščák  
Ing. Peter Kubičko  
Ing. Ján Palenčár

2<sup>nd</sup>.

### internal

Ing. Zlatko Fedor  
Ing. Michal Hladký  
Ing. Vladimír Jeleň  
Ing. Peter Karch  
Ing. Ján Kažimír  
Ing. Miron Kuzma  
Ing. Tomáš Reiff  
Ing. Marián Stanislav  
Ing. Attila Torok  
Ing. Gabriel Tutoky  
Ing. Lucia Vaľová  
Ing. Jozef Wagner

### external

Ing. Tomáš Gašpar  
Ing. Ľuboš Lorinc  
Ing. Marián Onder

3<sup>rd</sup>.

### internal

Ing. Oľga Duľová  
Ing. Zoltán Ďurčík  
Ing. Juraj Eperješi  
Ing. Juraj Chovaňák  
Ing. Pavol Jasem  
Ing. Pavol Kocsis  
Ing. Marek Lapko  
Ing. Pavol Maliňák  
Ing. Jana Modrovičová  
Ing. Ľuboš Popovič  
Ing. Beáta Tomoriová  
Ing. Jozef Vrana

### external

Ing. Ľubomír Molitoris  
Ing. Juraj Koščak  
Ing. Jozef Kováč  
RNDr. Marcel Kudláč

5<sup>th</sup>.

### external

Ing. Tyler Frank  
Ing. Viliam Ročkai  
Ing. Marek Skokan

## 3 EQUIPMENT

### 3.1. Teaching and Research 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)

### 3.2. Special Measuring Instruments and Computers

About 80 PCs and 20 servers (e.g. Cybernetics, MatlabWebServer), programmable logic automates of various types (2 x ControLogix with redundant power supply, 1 x Micrologix, 5 x PLC-5/20E, 2 x SLC 5/04, 2 x SLC-5/03, 2 x SLC5/01, TSX-47/40, TSX-17, SIMATIC S5-90U, SIMATIC S5-95U), far connectors, industrial visualization terminals and intelligent measurement elements, block of far I/O based on modules PLC, 2 x industrial terminal Panel-View-550, 1 x industrial PanelView Plus 600, 3 x analogue computers MEDA-50, three-phase drive Rockwell-Automation, models: for measurement and regulation of hot water supply, ball&plate, helicopter, magnetic levitation, intelligent house, traverse, portal crane, cableway, ball in the tube, 3 x KEPHER mobile robots, magnet, asynchronous drive, PowerMonitor equipments, resources and programs for image processing and recognition resources for infrared images recognition: 2 x PC-LabCard 812, 8 x single-chip-computer configurations based on I-80552, 10 x set TEMS-51 LAB based on I-8031, three application on-chip-computer configurations 196 LAB based on I-80196, 3 x 3-channel oscilloscope, 3 x generator of signals, 3 x variable voltage supply, Lego mind-storm system, 4 x kit based on ADSP - 2100 signal processor; 4 x kits based on ADSP - 2181 signal processor. Oracle Server 10g.

Equipment for audio-visual perceptual experiments and virtual reality, including sound-attenuation experimental room (Tepro s.r.o) with RME Fireface 400 and other sound processors, Crown A-75 amplifiers, Bose Acoustimass speaker arrays, Etymotic Research and Sennheiser headphones, PCB Piezotronics and Knowles Electronics microphones, Polhemus Fastrak 6-degree-of-freedom position tracker, and National Instruments digital spectrum analyzer.

NI SCXI 1000 measurement system, NI 9263 4-channel 10V, 16-bit analog output module; NI 9423 8 channel 24, sinking digital input module, CDAQ 9178, 8-slot USB 2.0 chassis for compactDAQ.

## 4 TEACHING

### 4.1. Undergraduate Study (Bc.) – 1. level

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

#### 4.2. Graduate Study (Ing.) – 2. level

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

Knowledge Discovery	3 <sup>rd</sup>	2/2	Paralič
Philosophic Problems of Cybernetics and UI	4 <sup>th</sup>	2/2	Sarnovský
Repetition of UI Foundations	4 <sup>th</sup>	0/2	Sinčák
UI Applications Seminar	4 <sup>th</sup>	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>
- Access-eGov, Access to e-Government Services Employing Semantic Technologies*, is a research project funded by the European Commission within the IST Program (6th Framework Program) FP6-2004-27020, coordinator: Tomáš Sabol. duration: 2006-2009, TUK team members (in cooperation with the Faculty of Economics): Marián Mach, Peter Bednár, Karol Furdík. Activity: Access-eGov addresses one of the main objectives of the Action Plans eEurope and eEurope+ "Government on-line: electronic access to public services" by "bringing administrations closer to citizens and businesses through the use of Internet" while putting user at the centre. Access-eGov is a thirty-six months EU-funded research and development project that aims to develop and validate a platform for composition of government services into complex process definitions (covering life events/business episodes) enabling semantic interoperability of particular e-Government services. Web page: <http://www.accessegov.org>
- 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 in 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 Duřová, 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 annotation, search, creation, and accessing knowledge employing metadata for semantic description of knowledge, Scientific Grant Agency project No. 1/4074/07, duration: 2007 – 2009, members: Marián Mach (project leader), Tomáš Sabol, Ján Paralič, Kristína Machová, Peter Bednár, Peter Butka, Martin Sarnovský, František Babič, Peter Smatana, Pavol Jasem, Jozef Vrana; activity: Project focuses on work with knowledge in form of metadata. This metadata enable to define content of information entities (most often in form of textual documents) in a way suitable for machine processing. Emphasis is put on domain theories in form of ontological knowledge models, parts of which may be used for annotation of information. Project should bring progress in the following research areas: Annotation of knowledge by means of classification and clustering algorithms; Automatic abstracts' generation; Web mining using knowledge models; Design of conceptual ontological models; Retrieval in the environment with semantically described knowledge; Support of knowledge creation processes; Text mining in distributed environment.*
- *Learning systems based on computational intelligence, Scientific Grant Agency project No. 1/0885/08, duration: 2008 – 2010, members: Peter Sinčák (project leader)*
- *Contextual plasticity in spatial auditory maps. National Institutes of Health - National Institutes of Deafness and Communication Disorders (USA) # 1 R03 TW007640-01, duration: 2006 – 2009, members: Barbara Shinn-Cunningham (Boston University), Norbert Kopčo (Principal Investigator), Rudolf Andoga. Summary: The proposed research has two main goals. The first goal is scientific: to gain new knowledge about the dynamic processes involved in human spatial auditory perception. Such knowledge is important for practical reasons (e.g., for the design of improved auditory prosthetic devices) as well as because it will improve basic understanding of the role of plasticity and dynamic processes in auditory processing. The second goal of this proposal is to further develop the existing collaboration between the Auditory Neuroscience Laboratory (ANL) at Boston University (BU) and the newly established Perception and Cognition Laboratory (PCL) at the Technical University of Kosice, Slovakia (TUK).*
- *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, Duřová, 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.

- *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).*
- *Auditory perception of space and loudness in real environments – Human Frontiers Science Program ST-00080 / 2008-C – Nov 2008-Jan 2009. PI Norbert Kopčo. Collaborator: Simon Carlile, University of Sydney.* A series of behavioral and modeling studies is proposed with the goal of improving our understanding of 1) how normal-hearing humans localize speech sources in realistic complex environments consisting of other speech sources, and 2) how this ability relates to the ability to use spatial attention to enhance understanding of the speech of one of multiple talkers. The results will be important for bridging the gap between our understanding of the basic parameters that influence performance in simple laboratory experiments and behavior in complex every-day situations.
- *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.*
- *Crossmodal influences in perceptual learning – National Stipend Program for support of mobility. Grantee Norbert Kopčo. Collaborator: Aaron Seitz, University of California in Riverside.* Research on crossmodal effects in perceptual learning, focused on auditory distance perception.
- *Centrum 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
- University of Dortmund, Germany
- Waseda University, Tokyo, Japan
- Technical University of Czestochowa
- Tokyo Institute of Technology, Japan
- Kyushu Institute of Technology, Japan
- Université Joseph Fourier Grenoble, IUT 1 (Institut Universitaire de Technologie 1), Grenoble, France
- Heudiasyc UMR CNRS 6599, UTC, Compiègne, 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. György 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

### 6.2.1. Visits of Staff Members to Foreign Institutions

- Kopčo, N: Boston University, Duke University, University of Sydney, University of Oldenburg, Charles University, Austrian Academy of Sciences
- Lukáč, G.: University of Regensburg, Germany
- Mach, M.: University of Regensburg, Germany
- Mach, M.: Infineon Technologies IT-Services, Klagenfurt, Austria
- Wagner, J.: Laboratoire de Recherche en Informatique, Paris, France
- Ocelíková, E.: Dept. of Control Engineering, Czech Technical University, Prague
- Paralič J. and Wagner, J.: Institute of Computer Science, Heraklion, Greece
- Paralič J. and Wagner, J.: InterMedia, Oslo, Norway
- Vaščák, J.: University Hradec Kralove, Czech Republic

### 6.3. Membership in International Organizations and Societies

- Jakša, R.: IEEE, Computational Intelligence Society
- 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 microCAD The University 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, IEEE
- 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 - Supplementary 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

#### 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 Programmes

- 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 FEI TUKE and Escola Universitaria Salesiana de Sarria Universitat Autònoma de Barcelona, Spain. Contact person: Iveta Zolotová
- Socrates - Erasmus agreement between TU of Košice and Czech University of

Agriculture, Prague, Czech Republic. Contact person: Eva Ocelíková

## 7 THESES

### 7.1. PhD. Theses

1. Babič František: **Chyba! Nenašiel sa žiaden zdroj odkazov.**
2. Hládek Daniel: Learning System Based on Generalization of Fuzzy Rules
3. Demjén Erna: Segmentation of fiber-like objects using energy based models
4. Lonščák Richard: Intelligent modeling and control of large scale systems
5. Sarnovský Martin: Knowledge discovering in textual databases using the grid computing

### 7.2. Masters Theses

Name	Title
Andrek Tomáš	Multilayer Automation Architecture - Industrial Application Server – Lab Model Intelligent House
Balla Marek	Application of Interactive Evolutionary Computation in Webdesign
Barto Michal	Temporal aspects of contextual plasticity in spatial auditory perception
Berko Kristián	Local Weather Prediction Using Neural Networks
Berendová Monika	Annotation of web content
Boro Pavol	Measuring distance in stereo vision
Briškárová Alena	Electronic teaching tools for analyses of data from data warehouses
Bulik Peter	Analysis and Synthesis of Information and Control Systems by Utilizing of Support Systems
Čerep Matúš	Data clustering by boundary mode detection
Dancák Jaroslav	Application of HYSDEL tool for simulation and control of dynamic systems
Demčák Peter	Fuzzy Control Adaptation of a Walk Model by an Evolutionary Algorithm
Drenčák Tomáš	Semantic web services composition for support of text mining tasks
Dvorščák Stanislav	Intelligent Searching Machine Based on the Semantic Web Searching
Gontkovič Daniel	Output control of discrete-time linear dynamic systems
Fič Ján	Control of Mobile Robot Khepera II Using Methods of Artificial Intelligence
Fila Dominik	Local and remote control of systems – Traverse, Intelligent House and Magnet
Hládek Ľuboš	Uncontrolled Learning Methods for Autonomous Map Building with Mobile Robot
Holod'ák Dušan	Evolutionary Optimization of Neurocontroller for Bipedal Walking of Humanoid Robot

Hotáry Lukáš	Control of LEGO NXT mobile robot by reinforcement learning AGREL
Hošák Rastislav	The information level of manipulator system model control
Husár Daniel	The influence of distractor location on contextual plasticity in spatial auditory perception
Gombosová Dana	Use of anytime algorithms in design of a mathematical model of a small turbojet engine MPM 20
Chomják Karol	Detection of moving objects in image sequence
Ilkovič Ján	Proposal and realization of technological level of the manipulator system model control
Juríček Peter	Structured residual generators design
Jurov Pavol	Automatic subgoals discovery for hierarchical reinforcement learning
Karol' Tomáš	Realization of communication and visualization software for manipulator system model control
Kellnerová Stanislava	Classification using Learning Classifier Systems
Kerekes Ladislav	Design of an E-Learning Module for Education Support of Artificial Intelligence on Secondary Schools
Kica Marek	Incremental system for recognition of visual information
Kišeľa Michal	Knowledge transfer in hierarchical reinforcement learning
Kocúr Miloslav	Data Integration Rules and Semantic Web
Kočiš Tomáš	Evolution of Neurocontroller for Movement of Snake Robot
Kollár František	SVD in dynamic systems control
Kollár Peter	Fault tolerant control systems with reconfiguration
Kopko Marek	Identification Algorithms Design for Models of Dynamic Systems
Korytiak Peter	ITD processing and cortical localization of contextual plasticity in spatial auditory perception
Krajč Martin	Analysis of web services execution
Križan Igor	Bayesian optimization algorithm and domain knowledge
Kroupová Ľuboslava	Data multicriterial classification by hierarchical clustering methods
Krupová Daniela	Electronic teaching tools for analyses of transactional data
Kuchta Martin	Generation of a Position of Organizations Found on the Web with the Aid of GPS
Kuriščák Ivan	Preprocessing of Image Data for Weather Forecast Using Neural Networks
Lefkovitš Samuel	Graphs Layout Optimization Using Kohonen Neural Network
Legen Tomáš	Multilayer Automation Architecture - Industrial Application Server – Lab Model Ball in Tube
Leško Ľubomír	Application of MPT Toolbox for laboratory model "ball & plate"

Lörincz Ladislav	Digital system of control of a small turbojet engine MPM-20
Martinkovič Martin	Utilizing Petri Nets for Modeling of Information Systems
Masník Matúš	Database application for creation of time sheets described work on research projects
Mášek Petr	Application of AI in sports betting
Nagy Roland	Design of Experimental Means for Education Support of Artificial Intelligence and Robotics on Primary Schools
Novák Miroslav	Control of models Cableway and Bells within DSC DCAI
Pangráč Branislav	ILD processing and cortical localization of contextual plasticity in spatial auditory perception
Pavlík Miloš	Control of models of Cableway, Bells and Tube and integration to DSC on DCAI
Petrula Stanislav	Realization of database application for collection and analyses of performed events in collaborative environment
Peklanský Jozef	Spatial expansion vs. shift as a model of contextual plasticity in spatial auditory perception
Predajnoš Slavomír	Realization of selected MIS applications on the basis of Oracle and Microsoft products
Repka Martin	Information extraction about citation nets
Rolko Miroslav	Modular Neural Networks Based On Interactive Learning
Rusňák Peter	Application of AI in meteorology
Rutrich Marek	Adaptation of Fuzzy Cognitive Maps for Navigation Purposes
Sabol Stanislav	Use of local operators for image quality improvement during recognition
Scherer Timon	Realization of a web-based application for management of semestral works and final thesis
Sim Michal	Control of shelf collator model on technological and dispatching level
Smolár Peter	Application of AI in cardiology
Sopko Marcel	Top-down factors and contextual plasticity in spatial auditory perception
Styk Michal	The Text Data Classification Using Machine Learning Methods
Šurin Ivan	Effect of visual input on contextual plasticity in spatial auditory perception
Suvák Ján	Control of servomotor LUN 6743 in different operational states of a small turbojet engine MPM-20
Šuster Ivan	Implementation of information level of shelf collator model control
Šuster Peter	Multimodel adaptive control
Tibenský Martin	Navigation of Multiple Mobile Robots Using Artificial Life Methods
Tirč Zdenko	Application of AI in ECG analysis



Tuhársky Jaroslav	Integration of Evolutionary Computation and Neural Networks Means for Intelligent Control
Vanický Michal	Learning Genetic Fuzzy System Algorithm for Mobile Robot Navigation
Vinca Roman	Analysis and Synthesis of Information and Control Systems for Production Line
Volkay Pavol	Application of Neuro-Fuzzy Models Based on ANFIS Method in Control of Dynamical Systems
Živčák Peter	Multidimensional data classification by using of different metrics
Wolf Martin	Mobile Robot Navigation Using Stereovision

### 7.3. Bachelors Theses

Name	Title
Albert František	Application of web services on selected application
Andrejčák Jaroslav	Study Material Preparation for work with system NAO
Bagar Ľubomír	Demo applications for neural network study support
Bodnár Erik	Control of Gait of Aibo Robot Using Neural Networks
Breza Jozef	Experimental identification of a small turbojet engine MPM-20
Bučko Matúš	System of quality as foundation for effective business company control
Bujňáková Andrea	Mobile technologies in electronic banking services
Čániová Beáta	Application of artificial intelligence in IT for garden architecture
Červený Maximilián	Autonomous Map Building with Grid Representation in Mobile Robotics
Delinčáková Katarína	Design and implementation of the electronic education portal
Dostal Milan	Inverted Pendulum Control Using Neural Networks
Dringuš Adrián	Suggesting bank products to bank clients based on their categories
Đuriš Štefan	Design and implementation of a web-based client application on an ERP systém for sales managers
Džačko Michal	Application of selected knowledge discovery methods on real dataset
Falis Matúš	Use of methods of artificial intelligence in analytic modelling of aircraft turbojet engines
Faltičko Pavol	Computer vision of mobile robot
Fedor Matúš	Financial data modelling
Fónod Róbert	Analysis and Synthesis Models of Dynamic Systems
Frendák Lukáš	Suggesting a calling program based on the processing of T-Com invoices

Furimský Marek	Building the application for parametric tests
Gašpar Vladimír	Design and implementation of a web-based client application on an ERP systém for sales representatives
Gazda Tomáš	Modeling of Mechanical Systems by Matlab/Simulink and SimMechanics
Golenya Dalibor	Support for electronic interchange of invoices between companies using ERP systém based on Microsoft Dynamics NAV
Hajňuková Miroslava	Service oriented architecture and its exploitation in selected SME
Hodák Miroslav	Social networks and their users published data vulnerability
Hôrčík Peter	Architecture Integrated Information Systems of Business Processes
Hučko Ondrej	Experimental identification of servomotor LUN 6743
Hušek Zdenko	Analysis and Design of Mobile Robot Control in Formations
Chochrun Peter	Proposal and realization of the heat system model
Jadlovská Slávka	Inverted Pendula Modeling and Control
Janíčková Lenka	Management of Projects in Small Furniture Company with Production of Exclusive Models
Kačmár Július	Content Management System (Phone) and its exploitation for Project Management
Kačmár Matej	Multilevel crossroad model
Kmeť Marián	Creation of an accessible web application
Kobáková Renáta	Current utilization of corporate data in human resources management in selected Slovak enterprises and possibilities for improvement
Kotras Martin	Adaptation of Fuzzy Cognitive Maps for Navigation Purposes
Kováčik Marko	Analysis of tools for software development from SME's perspective
Kriško Róbert	Design and implementation of an eShop
Kundrát Jozef	Clustering of Visual Information from Aibo Robot\\ Using Kohonen Neural Network
Labancová Bernadeta	E-government in Slovakia and EU countries
Laciňák Lukáš	Analysis and proposal of lighting system
Libová Lenka	Design and implementation the system of templates for web portal
Lizáková Ľudmila	Infrastructure of public key
Malý Marek	Design and implementation web interface for system monitoring state of business objects
Melega Juraj	Use of datamining methods for business strategies based on technical analysis
Miartuš Adam	Tables Layout Optimization
Mikloš František	The principle of requisite variety in automatic control

Miroššay Pavol	Web design optimization in order to improve the search ability
Mišaga Lukáš	Methodology and Tools of Modelling and Control of Enterprise Processes
Mražiková Anna	Methods for measurement of eHealth's impact
Molčan Anton	Application of MPT Toolbox for modelling of dynamic systems
Morvay Peter	The application of the modern web technologies for web forms validation
Novák Tomáš	Determination of evaluation criteria weight significance
Onofer Štefan	Comparison of response evaluation methods in sound localization experiments
Onuška Martin	Generation of typical categories of bank clients using clustering methods
Orkuty Štefan	Personal data protection from the Slovakia citizens' perspective
Orolín Marek	Bibliographic information extraction from PDF documents
Paľa Martin	Navigation of an Autonomous Vehicle by Fuzzy Cognitive Maps
Papcun Peter	Realization of closed control circuit of the lighting system
Pasternák Jozef	Security of the education web portals
Petráš Mário	Matlab Library of Hydraulic Systems
Petrík Martin	Keeping of the web standards
Poliak Štefan	Prediction of typical categories of bank clients
Pončák Matej	Web application for support of study results evaluation at schools in a weighted manner
Prídavok Miloš	A demonstrative application of XML technologies
Prídavok Mojmír	Using XSLT for selection and simple data processing
Rakuščinec Tomáš	Social network visualization
Richnavská Mária	Management of SME using ICT
Riňak Martin	Creation of a web application and its influence on the development of a small company
Salanci Martin	Simplex method in linear programming tasks solution
Serbák Vladimír	Linear matrix inequalities in linear programming tasks solution
Sipský Lukáš	MS Excel – Work with Database and OLAP
Slivka Tomáš	Designing of the heat system closed control circuit
Socha Jaroslav	Web application for information filtering by means of taxonomy
Struckelová Lucia	Modelling of process flows in company processes
Šefčík Tomáš	Modeling of mobile robotic workplace with interactivity

Šepental Patrik	Proposal and realization of the image recognition system within the manipulator system model control
Šilon Marián	Proposal and realization of the bar code system for technological workplace model control on the manipulator system basis
Šimko Július	Project for delivery of electronic services for mediation of work from home
Škorňa Milan	Elektronic signature and PKI
Šťava Daniel	Time - bar analysis of stock market data
Štofa Ján	Personal data protection from the SME's perspective
Tkačík Tomáš	Communication of software systems Matlab and LabView in application of small turbojet engines control
Tóth Vojtech	Analysis of selected economic performance indicators of Slovak companies
Trmka Filip	Analysis of internal ERP systems
Trefný Ivan	Comparison of selected methods for sentiment classification in discussion groups
Vajda Ján	Analysis and synthesis of linear dynamic systems
Val'ková Zuzana	Comparison of telecommunication provider products using a knowledge base system
Vansa Martin	Modeling and control of synchronous machines
Verčimák Viliam	Modeling and identification of small turbojet engines with use of methods of artificial intelligence
Vilinský Martin	Digital system of data acquisition of a small turbojet engine MPM-20
Zavada Peter	Monitoring and controlling real processes – Magnet and Tube

## **8 OTHER ACTIVITIES**

- 7<sup>th</sup> Slovak – Hungarian Joint Symposium on applied Machine Intelligence (SAMI 2009 - <http://www.sami.tuke.sk/2009>) has been organized in Herľany, Slovakia, January 29-31
- 4<sup>th</sup> Workshop on Intelligent and Knowledge oriented Technologies (WIKT 2009) has been organized in Herľany, Slovakia, November 12-13
- 9<sup>th</sup> International Student Workshop on Data Analysis (WDA 2009) has been organized in Čertovica, Slovakia, July 2-4

## **9 PUBLICATIONS**

### **9.1. Books**

1. BABIČ, František - PARALIČ, Ján: WIKT 2009 : 4th Workshop on Intelligent and Knowledge oriented Technologies : Proceedings : November 12 - 13, 2009, Herľany, Slovakia. 1. vyd. Košice : Equilibria, 2009. 115 s. ISBN 978-80-89284-

- 42-9.
2. BABIČ, František - PARALIČ, Ján - RAUBER, Andreas: WDA 2009 : Workshop on Data Analysis : Proceedings of the 9th International Student Workshop : Čertovica (Low Tatras), Slovakia, July 2 - 4, 2009. 1. vyd. Košice : EQUILIBRIA, 2009. 105 s. ISBN 978-80-89284-41-2.
  3. DUDÁŠ, M., HLINKA, D. DANKOVČÍK, R. and TOMORI, Z.: "Kombinace nových experimentálních a bioinformatických postupů při zdokonalování metod předimplantační genetické diagnostiky," in Reprodukční medicína - současnost a perspektivy, A. Ostró, L. Pilka, and F. Lešník, Eds. Olomouc: Nakladatelství Olomouc, 2009, pp. 176-194.
  4. MACH, M.: Evolutionary algorithms: elements and principles. Elfa, Kosice, 2009, 250 pages, ISBN 978-80-8086-123-0.
  5. MACHOVÁ, Kristína: Strojové učenie v systémoch spracovania informácií. Elfa, Košice, 2009, 85s., ISBN 978-80-8086-130-8
  6. PIETRIKOVÁ, Alena - KOVÁCS, Attila N. - MODROVIČOVÁ, Jana: SCYR 2009: 9th Scientific Conference of Young Researchers : Proceedings from Conference: May 13th, 2009, Košice, Slovakia. 1. vyd. Košice : TU, 2009. 279 s. ISBN 978-80-553-0178-5.
  7. TOMORI Z. - DUDÁŠ, M.: "Využití moderní přístrojové a výpočetní techniky při selekci spermii," in Reprodukční medicína - současnost a perspektivy, A. Ostró, L. Pilka, and F. Lešník, Eds. Olomouc: Nakladatelství Olomouc, 2009, pp. 80-87.

## 9.2. Journals

1. ANDOGA, Rudolf - FOZO, Ladislav - MADARÁSZ, Ladislav: Intelligent fadec control systems of turbojet engines. In: Acta Avionica. roč. 11, č. 18 (2009), s. 7-11. ISSN 1335-9479.
2. BABIČ, František et al. : Knowledge practices laboratory. In: Ambient Intelligence Perspectives : Ambient Intelligence and Smart Environments : Selected papers from the First International Ambient Intelligence Forum 2008. vol. 1 (2009), p. 42-49. ISSN 1875-4163.
3. BABIČ, František et al. : Use of semantic principles in a collaborative system in order to support effective information retrieval. In: Computational Collective Intelligence. vol. 5796 (2009), p. 365-376. ISBN 978-3642-04440-3 ISSN 0302-9743.
4. BRUNO, Giuseppe - JANCUROVÁ, Lucia: Heavy flavours in ALICE. In: Journal of Physics G: Nuclear and Particle Physics. vol. 36, no. 6 (2009), p. 1-7. ISSN 0954-3899.
5. FURDÍK, Karol - MACH, Marián - SABOL, Tomáš: Towards semantic modelling of business processes for networked enterprises. In: E-Commerce and Web Technologies. vol. 5692 (2009), p. 96-107. ISSN 0302-9743.
6. GALDUN, Ján - THIRIET, Jean-Marc - LIGUŠ, Ján: Study of different load dependencies among shared redundant systems. In: Scalable Computing: Practice and Experience. vol. 10, no. 3 (2009), p. 241-252. ISSN 1895-1767.
7. HLÁDEK, Daniel - VAŠČÁK, Ján - SINČÁK, Peter: Multi-robot control system for pursuit-evasion problem. In: Journal of Electrical Engineering. roč. 60, č. 3 (2009), s. 143-148. ISSN 1335-3632.

8. KABÁT, Ján et al. : Magnetic diagnostic of a small-size jet engine initial magnetic measurements. In: Acta Avionica. roč. 11, č. 17 (2009), s. 29-33. ISSN 1335-9479.
9. KABÁT, Ján - LAZAR, Tobiáš - MADARÁSZ, Ladislav: Magnetic aura in the operational diagnostics of a jet engine (JE). In: Acta Avionica. roč. 11, č. 17 (2009), s. 26-28. ISSN 1335-9479.
10. KOPČO, Norbert - BEST, Virginia - CARLILE, Simon: Localizing a speech target in a multitalker mixture. In: Journal of the Acoustical Society of America. vol. 125, no. 4 (2009), p. 2691. ISSN 0001-4966.
11. KOPČO, Norbert et al. : Reference frame of the ventriloquism aftereffect. In: The Journal of Neuroscience. vol. 29, no. 44 (2009), p. 13809-13814. ISSN 0270-6474.
12. KOSTELNÍK, Peter - SABOL, Tomáš - MACH, Marián: Applications of semantic technologies in Aml. In: Ambient Intelligence Perspectives : Ambient Intelligence and Smart Environments : Selected papers from the First International Ambient Intelligence Forum 2008. vol. 1 (2009), p. 8-24. ISSN 1875-4163.
13. MADARÁSZ, Ladislav et al. : Situational control, modeling and diagnostics of large scale systems. In: Towards Intelligent Engineering and Information Technology. no. 143 (2009), p. 153-164. ISSN 1860-949X.
14. MACHOVÁ, Kristína - VRANA, Jozef - DŽBOR, Martin: Some approaches to make the internet searching easier. In: Ambient Intelligence Perspectives. vol. 1, no. 1 (2009), p. 166-173. ISSN 1875-4163.
15. MACHOVÁ, Kristína - GALOVÁ, Lenka: The particular mapping of the nearest surroundings graph of the actual web page. In: Journal of Information and Organizational Sciences. vol. 33, no. 1 (2009), p. 151-163. ISSN 1846-3312.
16. NÁVRAT, Pavol - PARALIČ, Ján: Acquiring, organising and presenting information and knowledge on the web. In: Computing and Informatics. roč. 28, č. 4 (2009), s. 393-398. ISSN 1335-9150.
17. PARALIČ, Ján et al. : Analyses of knowledge creation processes based on different types of monitored data. In: Foundation of Intelligent Systems. vol. 5722 (2009), p. 321-330. ISBN 978-3642-04124-2 ISSN 1867-8211.
18. REIFF, Tomas - SINČÁK, Peter: Towards intelligent systems with incremental learning ability. In: Studies in Computational Intelligence. vol. 243 (2009), p. 627-638. ISSN 1860-949X.
19. SARNOVSKÝ, Ján: On Governors. In: AT&P Journal. roč. 16, č. 2 (2009), s. 13. ISSN 1335-2237.
20. SARNOVSKÝ, Ján: Kyberkracia. In: AT&P Journal. roč. 16, č. 5 (2009), s. 7. ISSN 1335-2237.
21. SARNOVSKÝ, Ján: Matematika v študijných programoch. In: AT&P journal : Priemyselná automatizácia a informatika. roč. 16, č. 8 (2009), 1 s. ISSN 1335-2237.
22. VAŠČÁK, Ján - RUTRICH, Martin: Siete Neural Gas pri navigácii v cestných sieťach (2). In: AT&P Journal. č. 1 (2009), s. 53-54. ISSN 1335-2237.
23. VAŠČÁK, Ján - RUTRICH, Martin: Siete Neural Gas pri navigácii v cestných sieťach (3). In: AT&P Journal. č. 2 (2009), s. 65-67. ISSN 1335-2237.

### 9.3. Conferences

1. ANDOGA, Rudolf et al. : FADEC control system for MPM 20 engine. In: SAMI 2009 : 7th International Symposium on Applied Machine Intelligence and Informatics : January 30-31, 2009, Herľany, Slovakia. Budapest : Budapest Tech, 2009. s. 103-108. ISBN 978-1-4244-3802-0.

2. BARTOK, Juraj et al. : Predpovedné a detekčné metódy význačných a nebezpečných javov založené na dolovaní meteorologických dát. In: WIKT 2009 : 4th Workshop on Intelligent and Knowledge oriented Technologies : Proceedings : November 12 - 13, 2009, Herľany, Slovakia. Košice : Equilibria, 2009. s. 76-82. ISBN 978-80-89284-42-9.
3. BEDNÁR, Peter - KASANICKÝ, Tomáš: Semantic enabled RESTful services. In: WIKT 2009 : 4th Workshop on Intelligent and Knowledge oriented Technologies : Proceedings : November 12 - 13, 2009, Herľany, Slovakia. Košice : Equilibria, 2009. s. 106-110. ISBN 978-80-89284-42-9.
4. BUTKA, Peter et al. : Distributed task-based execution engine for support of text-mining processes. In: SAMI 2009 : 7th International Symposium on Applied Machine Intelligence and Informatics : January 30-31, 2009, Herľany, Slovakia. Budapest : Budapest Tech, 2009. s. 29-34. ISBN 978-1-4244-3802-0.
5. BUTKA, Peter - BEDNÁR, Peter - BABIČ, František: Use of task-based text-mining execution engine in support of knowledge creation processes. In: Znalosti 2009 : 8. ročník konferencie : Brno, 4. - 6. februára 2009 : Zborník príspevkov. Bratislava : STU, 2009. p. 289-292. ISBN 978-80-227-3015-0.
6. DRENČÁK, Tomáš - PARALIČ, Marek: Towards automatic workflow composition and execution. In: WIKT 2008 : 3rd Workshop on Intelligent and Knowledge Oriented Technologies : Zborník príspevkov : Smolenice, 6.-7. november 2008. Bratislava : STU, 2009. s. 49-52. ISBN 978-80-227-3027-3.
7. ĎURČÍK, Zoltán: Kompozícia webových služieb - úvod do problematiky a návrh aplikácie. In: WIKT 2009 : 4th Workshop on Intelligent and Knowledge oriented Technologies : Proceedings : November 12 - 13, 2009, Herľany, Slovakia. Košice : Equilibria, 2009. s. 15-21. ISBN 978-80-89284-42-9.
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