

**FACULTY OF INFORMATICS  
AND INFORMATION TECHNOLOGIES**

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# **ANNUAL REPORT 2008**



**SLOVAK UNIVERSITY OF TECHNOLOGY IN BRATISLAVA**  
Faculty of Informatics and Information Technologies

© 2009, Ľudovít Molnár, Mária Bieliková, Pavel Čičák, Ladislav Hudec, Tibor  
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# 1 Message from the dean

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The year 2008 was the year of 45<sup>th</sup> anniversary of IIT education and research at the Slovak University of Technology and 5<sup>th</sup> anniversary of FIIT STU. At the celebration the main results have been reminded and the dean of the faculty awarded those who considerably contributed the development IIT or the FIIT STU by the Kempelen medal.



The evaluation of the Long term strategy for the year 2008 showed that almost all goals for this year have been successfully achieved. We are proud that there is still a high interest among secondary schools students to study the study programmes we have prepared for them at our Faculty and that our graduates have no problem to find suitable job.

The Report shows the results achieved in research that is of high priority at FIIT STU. Interlink of research and education is not only declared but also documented by research activities of our students. Research results of our students were presented at the 4<sup>th</sup> Student Research Conference organised by the Faculty. But what is even more important, some of them were published in international journals or presented at scientific conferences.

The year 2008 was important for the Faculty as our study programs passed through international accreditation realized by Institute of Engineering and Technology. The Academic Accreditation Committee has considered the report of the visit of our Faculty and our Action Plan.

## *IET Accredited Study Programmes*

	Designation and Title	Mode	Duration of Programme
1	Bc Informatics	Full Time	3 years
2	Bc Computer systems and Networks	Full Time	3 years
3	Ing Computer systems and Networks	Full Time	2 years
4	Ing Software Engineering	Full Time	2 years
5	Ing Information Systems	Full Time	2 years

Accreditation is as follows:

- Programmes 1 and 2 are awarded five years accreditation from the 2004 intake to the 2008 intake in partial fulfilment of the educational requirements for CEng.
- Programmes 3 and 4 are accredited for five years from the 2004 intake to the 2008 intake in fulfilment of the educational requirements for CEng.
- Programme 5 is accredited for four years from the 2005 intake to the 2008 intake in fulfilment of the educational requirements for CEng.

Unfortunately, we have not been so successful in all our activities. Due to lack of space capacity for the staff as well as for the laboratories many activities have been slowed down or even stopped at all. Therefore all academic staff of the Faculty as well as all our students welcomed activities leading to the new building of the FIIT STU.

The Report shows the current state the Faculty has achieved in education, research and cooperation with business partners. The reader can find the study programs offered by the Faculty and the research projects realized at the Faculty. We recommend reading also previous Annual reports to see a progress in education a research.



Prof. Eudovít Molnár  
Dean of the FIIT STU

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## 2 Faculty Management Bodies

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According to the Act No. 131 of February 21, 2002 (the University Code and Amendments and Supplements to some Acts and subsequent acts that have amended them), the faculty management is to be formed out of its academic community members. It is composed of lecturers and research workers (representing the employee part of the academic community of the faculty) and of students (representing the student part of the academic community of the faculty).

According to the University Code, academic management bodies of a faculty are the following:

- a) the Academic Senate of the faculty,
- b) the Dean,
- c) the Scientific Board of the faculty,
- d) the Disciplinary Commission of the faculty for students.

### 2.1 Academic Senate of the Faculty

The Academic Senate of a faculty is a representative body of the faculty. It comprises of the employee part and the student part.

#### Members of the Academic Senate in 2008

*Presidium of the Academic Senate*  
presidium@as.fiit.stuba.sk

*Pavol Návrát, Professor*  
chair  
chair@as.fiit.stuba.sk

*Milan Kolesár, Professor*  
chair of the faculty section

*Ján Máté*  
chair of the student section

*Secretary of the Academic Senate*  
secretary@as.fiit.stuba.sk

Mária Hricová

*Members of the faculty section of the Academic Senate*

staff@as.fiit.stuba.sk

Ladislav Hudec, Assoc. Professor

Daniela Chudá

Katarína Jelemenská

Ivan Kapustík

Milan Kolesár, Professor

Vladimír Kvasnička, Professor

Pavol Návrát, Professor

Juraj Štefanovič

*Members of the student section of the Academic Senate*

students@as.fiit.stuba.sk

Ondrej Bellay (till June 2008)

Celestín Černák (since October 2008)

Eva Danillová

Michal Ďurfina (till June 2008)

Andrej Folgeton (since October 2008)

Ján Máté

**Activities of the Academic Senate of the Faculty in 2008**

The Academic Senate of the Faculty of Informatics and Information Technologies in 2008

- discussed the proposal of study programmes of the Faculty presented by the Dean,
- approved new vice-deans, presented by the Dean,
- approved the additional conditions for admission to the study programmes offered by the faculty, presented by the Dean,
- approved the budget of the Faculty, presented by the Dean,
- approved the annual report on activities and annual statement on economic management of the Faculty, presented by the Dean,
- submitted the annual report on its activity to the academic community of the Faculty.

Prof. Pavol Návrát  
Chair Academic Senate FIIT STU

**2.2 Dean**

The Dean is the representative of the Faculty who manages, represents and acts on behalf of the faculty. The current Dean was elected by the Academic Senate of the Faculty in its meeting held on October 19, 2007 and appointed by the Rector to his office on December 2, 2007 for a four year office term. Dean inauguration ceremony was held on March 11, 2008. New vice-deans were approved by the Academic Senate in January 2008.



*Ludovít Molnár, Professor*

Dean

dean@fiit.stuba.sk

*Mária Bieliková, Professor*

Vice-Dean for Research and Human Resources

vice dean\_research@fiit.stuba.sk

*Pavel Čičák, Assoc. Professor*

Vice-Dean for National and International Relations and for Public Relations

vice dean\_cooperation@fiit.stuba.sk

*Margaréta Kotočová, Assoc. Professor*

Vice-Dean for Education

vice dean\_education@fiit.stuba.sk

*Štefan Kozák, Professor*

Vice-Dean for New Building and Material Resources

vice dean\_development@fiit.stuba.sk

## **2.3 Scientific Board of the Faculty**

### **Members of the Scientific Board in 2008**

#### *Chair of the Scientific Board*

Ludovít Molnár, Professor

#### *Deputy chair of the Scientific Board*

Mária Bieliková, Professor

#### *Members from the academic community of the Slovak University of Technology*

Mária Bieliková, Professor

Pavel Čičák, Assoc. Professor

Peter Farkaš, Professor

Pavol Horváth, Professor

Ladislav Hudec, Assoc. Professor

Margaréta Kotočová, Assoc. Professor

Štefan Kozák, Professor

Tibor Krajčovič, Assoc. Professor

Ludovít Molnár, Professor

Oliver Moravčík, Professor

Ján Murgaš, Professor

Pavol Návrat, Professor

Jiří Pospíchal, Professor

Gregor Rozinaj, Assoc. Professor

Vladimír Vojtek, Professor

Peter Volauf, Assoc. Professor

*External members*

Milan Češka, Professor – Brno University of Technology  
Ladislav Hluchý, PhD. – Institute of Informatics, Slovak Academy of Sciences  
Ivan Kalaš, Professor – Comenius University in Bratislava  
Josef Kolář, Assoc. Professor – Czech Technical University in Prague  
Karol Matiaško, Professor – University of Žilina  
Jaroslav Šušol, Assoc. Professor – Comenius University in Bratislava  
Jiří Šafařík, Professor – University of West Bohemia in Pilsen  
Liberius Vokorokos, Professor – Technical University in Košice

*Honourable members*

Milan Kolesár, Professor  
Vladimír Kvasnička, Professor

**Activities of the Scientific Board of the Faculty in 2008**

The Scientific Board of the Faculty of Informatics and Information Technologies in 2008:

- discussed an update of the long-term strategy of the Faculty development for the 2008 prepared in accordance with the long-term strategy of the Slovak University of Technology in Bratislava,
- evaluated the level of the Faculty regarding its educational activity and activities in the field of science and technology,
- discussed and approved the proposal of the study programmes for the academic year 2008/09 offered by the Faculty,
- discussed and presented to the Scientific Board of the Slovak University of Technology in Bratislava the criteria for habilitation of "associate professors" and criteria for nomination of "professors",
- endorsed other experts with the right to conduct Final examinations in the study programmes offered by the Faculty (in accordance with the University Code),
- endorsed members of the Board of Specialists for doctoral study programmes,
- endorsed supervisors for doctoral study programmes (in accordance with the University Code),
- conferred Wolfgang Kempelen Medal for momentous contribution to research and development in informatics and information technologies in connection to the Slovak University of Technology in Bratislava to:
  - Ladislav Gvozdják, Professor (in memoriam)
  - Norbert Frištacký, Professor (in memoriam)
  - Ján Blatný, Professor
  - Milan Češka, Professor
  - Milan Jelšina, Professor
  - Bořivoj Melichar, Professor

- Ivan Plander, Professor
- Anton Scheber, PhD.
- Angel Smrikarov, Assoc. Professor
- Stoyanka Smrikarova
- Tatjana Welzer, Professor.

Prof. Ľudovít Molnár  
Chair Scientific Board FIIT STU

## **2.4 Disciplinary Commission of the Faculty for Students**

The Disciplinary Commission of a faculty according to the University Code shall discuss misdemeanours of students and submit the proposal to the Dean who will resolve on it.

### **Members of the Disciplinary Commission for Students in 2008**

*Chair of the Disciplinary Commission of the Faculty for Students*

Ladislav Hudec, Assoc. Professor

*Members of the Disciplinary Commission of the Faculty for Students*

Juraj Štefanovič, PhD.

Ivan Kapustík

Michal Zimen (till Feb. 2008) – student of the doctoral degree programme

Peter Vojtek (since Nov. 2008) – student of the doctoral degree programme

Michal Ďurfina (till June 2008) – student of the master degree programme

Vladimír Michalec (since Nov. 2008) – student of the master degree programme

Lucia Szallayová (till June 2008) – student of the bachelor degree programme

Valéria Harvanová (since Nov. 2008) – student of the bachelor degree programme

Assoc. Prof. Ladislav Hudec  
Chair Disciplinary Commission for Students FIIT STU



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## 3 Study

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### 3.1 Undergraduate Study (Bc)

In 2008 two accredited study programmes with regular length three years were offered:

- *Informatics*,
- *Computer Systems and Networks* (as an orientation in Computer Engineering).

Both above mentioned offered study programmes are accredited by the Engineering Council UK for five years from the 2004 intake to the 2008 intake in fulfilment of the educational requirements for CEng. The announcements of these accreditations are published on the official web site of the Engineering Council UK, <http://www.engc.org.uk/>.

The following table shows the numbers of full-time bachelor programme students throughout the study (from the first to the final year) for last six years.

*Numbers of the full-time bachelor programme students*

	1 <sup>st</sup> year	2 <sup>nd</sup> year	3 <sup>rd</sup> year	4 <sup>th</sup> year <sup>1</sup>
Academic year				
2003/2004 <sup>1</sup>	150	103	123	134
2004/2005	333	112	95 <sup>1</sup>	156
2005/2006	344	262	91	92
2006/2007	332	269	246	19
2007/2008	290	272	266	1
2008/2009	265	229	308	0

On the course we have 1 overseas student.

In June 2008 the students in the both study programmes defended their bachelor theses and passed the final examination. The number of all graduates was 196. From it, there were 133 in study programme Informatics and 60 in study programme Computer Systems and Networks.

The following students were conferred awards for their excellent study results:

- “*Magna cum laude*”: Igor Andruška, Peter Fillo, Michal Haluška, Juraj Kollár, Michal Kottman, Jakub Kožíšek, Dušan Kysel, Tomáš Labuda, Lenka Litvová, Vladimír Michalec, Pavel Michlík, Michal Olšovský, Peter Smolinský

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<sup>1</sup> Only the students in programme Informatics.

- *Dean's Award for Excellent Bachelor Thesis*: Pavel Michlík, Michal Olšovský
- *Dean's Commendatory Letter for Bachelor Thesis*: Peter Fillo, Peter Fridrich, Peter Holic, Marián Hönsch, Juraj Kollár, Michal Kompan, Tomáš Kramár, Ladislav Martinský, Jakub Marton, Miroslav Repaský, Dušan Rodina, Ondrej Ševce, Jakub Šimko, Stanislav Tkáč, Jozef Tomek, Ján Turoň, Ľuboš Ukrop, Dušan Zeleník.

766 applicants took part in the entrance examination to bachelor study programmes on April 16-17, 2008. The written examination consisted of mathematics and informatics with orientation on algorithmic and logic thinking (24 tasks, 65 points max.). 454 applicants were offered admission (314 Informatics, 140 Computer Systems and Networks), 265 out of them actually made use of it and were enrolled (180 Informatics, 85 Computer Systems and Networks).

### 3.2 Master Study (Ing)

In 2008, FIIT STU offered three accredited study programmes:

- *Software Engineering*: regular length two or three years<sup>2</sup>,
- *Computer Systems and Networks* (as an orientation in Computer Engineering): regular length two or three years,
- *Information Systems*: regular length two or three years.

All the above mentioned offered study programmes are accredited by the Engineering Council UK as follows:

- *Ing Software Engineering* and *Ing Computer Systems and Networks* study programmes are accredited for five years from the 2004 intake to the 2008 intake in fulfilment of the educational requirements for CEng,
- *Ing Information Systems* study programme are accredited for four years from the 2005 intake to the 2008 intake in fulfilment of the educational requirements for CEng.

The announcements of these accreditations are published on the official web site of the Engineering Council UK, <http://www.engc.org.uk/>.

The following table shows the numbers of full-time master programme students throughout the study for last six years.

*Numbers of the full-time master programme students*

	2003/2004	151
Academic	2004/2005	182
year	2005/2006	231
	2006/2007	290
	2007/2008	326
	2008/2009	362

On the course we have 4 overseas students.

<sup>2</sup> Three years for students who have not obtained their first degree in related field.

In these study programmes 83 students graduated in spring semester 2007/2008 and 11 students in autumn semester 2008/2009:

- 44 graduates in Software Engineering,
- 33 graduates in Computer Systems and Networks and
- 17 graduates in Information Systems.

The following students were conferred awards for their excellent results<sup>3</sup>:

- “*Magna cum laude*”: Marián Šimko
- “*Cum laude*”: Stanislav Angelovič, Michal Dobiš, Ivan Kišac, Mária Pohronská, Oto Vozár
- *Dean’s Award for Excellent Master Thesis* (proposal): Viktor Bachratý, Marián Šimko,
- *Slovak Academy of Sciences Award for Excellent Master Thesis* (proposal): Marek Tomša, Tomáš Selnekovič
- *Tatra Bank Award for Excellent Master Thesis* (proposal): Ivan Kišac,
- *Dean’s Commendatory Letter for Master Thesis*: Stanislav Angelovič, Viktor Bachratý, Stanislav Bebej, Martin Cichý, Michal Dobiš, Michal Jajcaj, Miroslav Kallo, Peter Mišák, Mária Pohronská, Richard Veselý, Oto Vozár, Michal

235 applicants took part in an entrance examination on July 2008 as a prerequisite to the master programmes. 200 students were offered admission (79 Software Engineering, 72 Computer Systems and Networks, 49 Information Systems), 176 out of whom were enrolled.

### 3.3 Doctoral Study (PhD)

Quality and number of doctoral students significantly influence the results obtained in research. We observe an insufficient number of doctoral students in the fields of informatics and information technologies. The graduates have excellent opportunities in finding positions in the labour market, therefore, even if they are interested in further studies they often prefer to be admitted as part-time students. This trend has been slightly reversed now. The number of full-time doctoral students is on an increase.

*Evolution of number of doctoral full-time students (year-end figures)*

Year	2001	2002	2003	2004	2005	2006	2007	2008
Number of students	10	11	16	22	22	24	25	30

<sup>3</sup> Several awards are conferred once per academic year – the selection is made according to proposals from graduates after each semester.

In 2008 following dissertations were defended:

- Solčány Viliam: The Lookahead in a User-Transparent Conservative Parallel Simulator (supervisor: Jiří Šafařík, Professor)
- Trhan Peter: The Application of Neural Networks in Environmental Modelling (supervisor: Vladimír Vojtek, Professor)
- Babík Marián: Optimizing Description Logic Reasoning for Matchmaking and Composition of Semantic Web Services (supervisor: Ladislav Hluchý, PhD.)
- Ciglan Marek: Replica Delivery Optimization and Content Synchronization in Data Grids (supervisor: Ladislav Hluchý, PhD.)

2008 was already the fourth year that the Faculty admitted students for study in newly accredited study programmes in doctoral study. Three accredited study programmes are currently offered:

- *Applied Informatics*,
- *Computer Systems and Networks* (as an orientation in Computer Engineering),
- *Program Systems* (as an orientation in Software Engineering).

Regular length of all doctoral study programmes is 3 years for full-time study and 5 years for part-time study.

### 3.4 Student Conferences and Competitions

The Faculty organised in 2008 several student competitions and conferences. The importance of involvement of the students in such events is very high. Students took active participation in various technical and research activities (co)organised by the Faculty:

#### *Imagine Cup 2008*

- 1<sup>st</sup> place Slovak finals, 2<sup>nd</sup> place in World Finals, Paris, France:  
Marián Hönsch, Michal Kompan, Jakub Šimko a Dušan Zeleník:  
Energy Consumption Manager, supervisor: M. Bielíková

#### *NAG 2008 (Networking Academy Games) – category of individuals*

- Slovak finals (Cisco Olymp): 2<sup>nd</sup> place Vladimír Michalec; 3<sup>rd</sup> place Štefan Guľa
- 1<sup>st</sup> place in Central Europe Finals: Vladimír Michalec (conferred the Memorable St. Gorazd Award Letter by the Minister of education)

#### *ACM International Collegiate Programming Contest 2008*

- Winners of Slovak University of Technology ACM Programming Contest, participation in Central European Regional Contest 2008, Prague, Czech Republic: Michal Lohnický, Mária Šajgalík, Daniel Švoňava

#### *ACM CZ Student Research Competition 2008*

- 1<sup>st</sup> place, Czecho-Slovak finals:  
Marian Hönsch, Michal Kompan, Jakub Šimko, Dušan Zeleník: Intelligent Household: Energy Consumption Manager, supervisor: M. Bielíková



- 3<sup>rd</sup> place, Czech-Slovak finals:  
Marián Šimko: E-Course Authoring: Method for Automated Metadata Generation,  
supervisor: M. Bieliková

*IIT.SRC 2008 – Informatics and Information Technologies Student Research Conference*  
(to be mentioned in the following section in more detail)

*RoboCup 2008, Soccer Simulation League*

- Winners of Slovak University of Technology RoboCup 2008:  
Ladislav Borženský, Peter Brtáň, Ján Kohút, Marek Koperdák, Vladimír Janov,  
Martin Petráš, supervisor: I. Kapustík

*Google Code Jam 2009*

- Participation in European Finals, Zürich, Switzerland (between 500 best of more than 11 thousand participants): Daniel Švoňava.

### 3.5 Awarded Theses

#### Excellent Bachelor Theses

*Student name:* Pavel Michlík  
*Degree program:* Informatics  
*Thesis title:* *Computer equipment management support*  
*Supervisor:* Branislav Steinmüller  
*Defended on:* May 2008  
*Annotation:* The goal of this thesis is to desing software equipmet for an IT department of a middle-sized or large organization. The designed system keeps exact information about all the computer equipment that the organization owns. The system allows the IT department to manage the processes related to equipment management as well, for example the process of approving requests for new equipment purchases or ordering the equipment from the supplier. The designed system works with physical location hierarchy, the organization's hierarchy and the equipment assignment as well as with the hierarchy of computer components. This thesis deals with analysing the processes that are related to equipment management as well as designing the core of the system and implementing its core functions.

*Student name:* Michal Olšovský  
*Degree program:* Computer systems and networks  
*Thesis title:* *Testing of Network Interface Card's extended MAC layer and design in PLD environment*  
*Supervisor:* Ján Hudec  
*Defended on:* May 2008  
*Annotation:* The goal of this project is to design an extended function of the network interface card on the MAC layer's level. This design is done in PLD environment and then it was tested. The thesis contains description of the OSI model, encapsulation, separation PDU on each layer of the OSI model and the format of the Ethernet II frame. This part is fol-

lowed by the NIC's functions description with the draft of the new function. The final descriptions of the new functions are followed by the implementation, testing and simulation. This part contains the sequence of recommended steps of the FPGA design process and characteristics of the VHDL language, as well. Testing cases are detailed described in appropriate tables. Technical part of the document contains descriptions of the key files, user manual with guide of opening and simulating the project in appropriate programs and the functional model.

### **Excellent Master Theses**

*Student name:* Viktor Bachratý  
*Degree program:* Software engineering  
*Thesis title:* *Image recognition using RBF neural networks*  
*Supervisor:* Peter Lacko  
*Defended on:* May 2008  
*Annotation:* The thesis analyzes the possibilities of the use of neural networks for image recognition. More specifically, it is about the detection and classification of road sign images. The objective is to achieve the highest possible accuracy by the lowest possible computational costs, to make the algorithms practically feasible. We discuss the basic algorithms for image processing as filtration, noise removal, change of resolution and edge detection. Sideways, we mention the Fourier transform and its use by image recognition. Further is to find the theoretical analysis of classification, regular neural networks and RBF networks. We present the classification using Relevance vector machines (RVM). We succeed to use the extension to the fast training algorithm, proposed by Thayananthan for regression tasks, on multiclass classification. Thank to this, it was possible to train a RVM for classification of cca 1200 elements large set containing 25 types of road signs. We compare the results of neural networks and the RVM with RBF basis functions. The achieved detection and classification rate was over 99.5%, although there are still possibilities to improve the results, which are mentioned in the final section of the thesis.

*Student name:* Marián Šimko  
*Degree program:* Software engineering  
*Thesis title:* *Relationships discovery in educational course content*  
*Supervisor:* Mária Bieliková, Professor  
*Defended on:* May 2008  
*Annotation:* The presented work deals with the problem of authoring adaptive educational systems that use the web as presentation medium. The work aims at an analysis of key features and the ways of modeling such systems. We focus at the domain model (a representation of presented content). The possibilities of automation of its particular parts are examined. A method of relationships discovery in educational course content is proposed. Relationships are being created between concepts representing educational content. The principle lies within the utilization of information retrieval techniques. Our goal is to discover the

knowledge hidden behind the educational text data. For this purpose several alternatives are proposed. These are verified and evaluated in the programming learning domain. CourseDesigner authoring tool was developed for the integration of the proposed method into the portal designed for teaching of programming.

*Student name:* Marek Tomša  
*Degree program:* Software engineering  
*Thesis title:* *Adaptive navigation support in open spaces*  
*Supervisor:* Mária Bieliková, Professor  
*Defended on:* May 2008  
*Annotation:* This work discusses the topic of Web navigation. We analyze problems with navigation on the Web and their reasons. We present an overview of existing methods and tools for navigation support and an overview of approaches to personalization and social aspects of web usage. In context of existing social bookmarking services, we discuss the possibility to use these services for navigation support. We propose a generally usable method for adaptive navigation support in information spaces which can be represented as graphs and a specialization of the proposed method to be used for adaptive navigation support on the Web. A specification and design of a system employing the proposed method and its evaluation by the implementation of the system is presented. We present results of evaluation of the proposed method and analysis of characteristics of the Web space relevant for the proposed method. Finally, a user study with the aim of evaluating the perceived usefulness of the proposed method and its implementation in a form of the web navigation support application is presented and results are discussed.

*Student name:* Ivan Kišac  
*Degree program:* Software engineering  
*Thesis title:* *Facial animation and visualized speech*  
*Supervisor:* Peter Drahoš  
*Defended on:* May 2008  
*Annotation:* This thesis deals with analysis of available information from area of human face animation and speech visualisation. We elaborate problematic of speech visualisation and to gather information needed to solve the project. We present several projects considered in animation creation phases. The thesis offers information about animation description, used models, techniques and languages for animation. It also presents some of the model behaviour aspects needed for better fidelity of presentation. After analysis of problem domain we deal with specification and design of application providing real-time human speech animation based on given input. This design was verified in implementation and testing phases. The project contains also suggestions for improvements and practical usage of this application.

*Student name:* Tomáš Selnekovič  
*Degree program:* Software engineering  
*Thesis title:* *Design and implementation of a non-axiomatic reasoning system*  
*Supervisor:* Vladimír Kvasnička, Professor  
*Defended on:* May 2008  
*Annotation:* Thesis explores a new theoretical approach toward problem solving in the field of reasoning systems – non-axiomatic reasoning. This concept was first described by prof. Pei Wang in his dissertation at the Indiana University, USA in 1995. Non-axiomatic reasoning aims to provide an alternative to the classical Turing-like computational problem solving approach. What makes a system implementing non-axiomatic reasoning (NARS) different from conventional reasoning systems is its ability to learn from its experience and to work with insufficient knowledge and resources (finite memory size and processing time). In this thesis we attempt to design and implement a non-axiomatic reasoning system and evaluate its properties.

Assoc. Prof. Margaréta Kotočová  
Vice-Dean for Education (first and second levels)

Prof. Mária Bieliková  
Vice-Dean for Research (including the third level education)

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## 4 Research

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### 4.1 Research Areas

The economic and social development is featured by an exponential growth of new scientific knowledge today. Informatics and information technologies are playing the key role. They boost the development of all scientific branches with the creation of new methodological base to do research and development. The development time decreases and the traditional theoretical and experimental abilities are extended broadly.

Informatics has developed to be an autonomous scientific area, which supports success not only in the branch of information technologies, but it also has wide consequences as for the lives of individuals and society. It is not a mere coincidence that research in the IIT area has become the priority among the research topics in the European Union.

Research at FIIT STU is oriented on these main research areas that respect the organisation, existing technical and laboratory equipment and professional skills:

- collaborative access, analysis and presentation of documents in the world-wide-web by the use of modern software tools,
- information development in distributed environment of intelligent agents,
- methods and tools for software systems development,
- the use of computer graphics in virtual and augmented reality systems,
- “echo state” neural networks and recurrent neural networks,
- application of evolutionary algorithms in theory of multi-agent systems,
- the methods and tools for security and administration of network and mobile computer systems,
- parallel systems for real-time computing,
- the design methods and tools for application-specific digital systems,
- formal methods and tools for design and description of digital systems,
- embedded computer systems,
- fault-tolerant high-speed parallel and distributed computer structures.

### 4.2 Scientific Activities

In the year 2008, FIIT STU has organised or co-organised several scientific events:

- scientific conference *Cognition and Artificial Life VIII*,

- scientific seminar *TPEV 2008 – Technologies for e-learning*,
- international conference *Cybernetics and Informatics 2008*,
- international scientific conference *SCCG 2008 – Spring Conference on Computer Graphics*,
- scientific conference *Znalosti 2008*,
- international scientific conference *SOFSEM 2008 – Annual Conference on Current Trends in Theory and Practice of Informatics*,
- scientific workshop *WIKT 2008 – Workshop on Intelligent and Knowledge Oriented Technologies*,
- international workshop *SMAP 2008 – International Workshop on Semantic Media Adaptation and Personalization*,
- regular seminar on *Artificial Intelligence* (organized at FIIT STU),
- regular seminar on *Personalized Web* (organized at FIIT STU).

The Faculty took part in providing technical and scientific programmes, especially through the work in programme committees of more than 45 conferences, mostly international:

- ACCS, International Conference on Advances Control Circuits & Systems,
- ADBIS, East-European Conference on Advances in Databases and Information Systems,
- AMIF, Ambient Intelligence Forum,
- CESC, Central European Seminar on Computer Graphics,
- CEE-SET, IFIP Central and East European Conference on Software Engineering Techniques,
- CompSysTech, International Conference on Computer Systems and Technologies,
- Cognition and Artificial Life, Annual Conference on Cognition and Artificial Life,
- CSE, International Scientific Conference on Computer Science and Engineering,
- DATAKON, Annual Conference on the Current Trends in Databases and Information Systems,
- ECDL, European Conference on Research and Advanced Technology for Digital Libraries,
- EJC, European Japanese Conference on Information Modelling and Knowledge Bases,
- ENASE, International Working Conference of Evaluation of Novel Approaches to Software Engineering,
- GCCP, International Workshop on Grip Computing for Complex Problem,
- IADIS, Virtual Multi Conference on Computer Science and Information Systems – Intelligent Systems and Agents,
- ICANN, International Conference on Artificial Neural Networks,
- ICC, International Carpathian Control Conference,

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- ICCIT, International Conference on Convergence and Hybrid Information Technology,
  - ICDEM, International Conference on Data Engineering and Management,
  - ICETA, International Conference on Emerging E-Learning Technologies and Applications,
  - ICWE, International Conference on Web Engineering,
  - INFORMATICS, Conference on Computer Science and Informatics,
  - ISD, International Conference on Information Systems Development,
  - ITAT, Workshop on Information Technologies – Applications and Theory,
  - ITI, International Conference on Information Technology Interfaces,
  - IWSSIP, International Workshop on Systems, Signals and Image Processing,
  - KES, International Conference on Knowledge-Based and Intelligent Information & Engineering Systems,
  - KES IIMSS, KES International Symposium on Agent and Multi-Agent Systems – Technologies and Applications,
  - MCCIS-ISA, IADIS International Conference, Intelligent Systems and Agents 2008 Conference,
  - MENDEL, International Conference on Soft Computing,
  - NCM, International Conference on Networked Computing and Advanced Information Management,
  - SAMI, International Symposium on Applied Machine Intelligence and Informatics,
  - SCCG, Spring Conference on Computer Graphics,
  - SCO, Sharable Content Objects,
  - SEESE, Software Engineering in East and South Europe at ICSE, International Conference on Software Engineering,
  - SERA, International Conference on Software Engineering Research, Management and Applications,
  - SMAP, International Workshop on Semantic Media Adaptation and Personalization,
  - SOFSEM, Annual Conference on Current Trends in Theory and Practice of Informatics,
  - SSKI, International Conference on Cybernetics and Informatics,
  - TPEV, Technologies for E-Learning Seminar,
  - ZNALOSTI, Annual Conference on Knowledge Acquisition, Representation and Exploitation,
  - VU, International Conference Virtual University,
  - WEBIST, International Conference on Web Information Systems,
  - WIKT, Workshop on Intelligent and Knowledge oriented Technologies,

- WISR, Workshop on Web Information Systems Reengineering, in conjunction with WISE, International Conference on Web Information Systems Engineering.

In 2008, FIIT STU organised or co-organised several events aimed at exhibition of students' research work. Above all, it was the 4<sup>th</sup> *Informatics and Information Technologies Students Research Conference – IIT.SRC 2008*, which was held on April 30, 2008.

IIT.SRC 2008 attracted 68 student papers (22 bachelor, 29 master, 16 doctoral, one paper authored by master students together with a doctoral student). It is an increase comparing to 2007 by 28% in bachelor and master student categories. This fact supports our endeavour to attract more students of graduate and undergraduate study. Papers were in two categories: full papers and extended abstracts.

IIT.SRC 2008 was organized in five sections:

- Software Engineering, Multi-agent Systems,
- Information Processing, Web Technologies,
- Computer Graphics, Multimedia, Artificial Intelligence,
- Computer Science, Information Technologies and Applications,
- Computer Systems, Computer Networks, Security and Grids.

The excellent student papers were awarded. The best paper award was conferred to:

- *category of doctoral students* – Peter Drahoš, Peter Kapec (Visually Driven Software Development Environment for Heterogeneous Programming, supervisor M. Šperka)
- *category of master students* – Marián Šimko (E-Course Authoring: Method for Automated Metadata Generation, supervisor M. Bieliková)
- *category of bachelor students* – Marián Hönsch, Michal Kompan, Jakub Šimko, Dušan Zeleník (Intelligent Household: Energy Consumption Manager, supervisor M. Bieliková)

Dean's award was the highest appreciation. It was conferred to:

- Michal Dobiš (Mining Design Patterns from Existing Projects, supervisor L. Majtás)
- Zuzana Petráková (Automatic Number Plate Recognition Using SVM, supervisor M. Čerňanský)
- Matej Jurikovič, Peter Pišteň (Remote Control of a Cell Phone by Computer via Bluetooth Interface, supervisor T. Krajčovič)
- Richard Veselý (Ontology Representation and Querying Using Relational Model, supervisor M. Bieliková)
- Peter Banda (Cellular Automata Evolution and Leader Election in a Symmetric Ring, supervisor J. Pospíchal)

Besides the 68 papers presented at the conference the *RoboCup* Exhibition was organised as a part of IIT.SRC 2008. Accompanying events included also programming competition and technical presentations related to modern information technologies given by the conference sponsors.



The finals of the 6<sup>th</sup> ACM CZ Student Research Competition were organised in November 2008 in Prague. Nine best bachelor and master student projects from six universities from the Czech Republic and Slovakia were presented. The project

- *Intelligent Household: Energy Consumption Manager* authored by our students Marián Hönsch, Michal Kompan, Jakub Šimko, Dušan Zeleník won the 1<sup>st</sup> place and the project
- *E-Course Authoring: Method for Automated Metadata Generation* authored by Marián Šimko won the 3<sup>rd</sup> place.

The *Werner von Siemens Excellence Award* is awarded annually by Siemens in cooperation with the Slovak Rectors' Conference to exceptional students and young researchers for the best master and PhD thesis. In year 2008 master thesis elaborated by our student Michal Dobiš (supervisor L. Majtás) was selected among best three projects for final presentation.

In November 2008 we actively participated in “The Night of Researcher”, event supported by European Commission. This event was organized in more than 150 European cities. 29 countries prepared presentations from the field of science and research for the laic public.

Four students' teams presented to public their research projects:

- *Energy Consumption Manager* – project won 2<sup>nd</sup> place at the worldwide competition Imagine Cup 2008, team: Marián Hönsch, Michal Kompan, Jakub Šimko, Dušan Zeleník supervised by M. Bieliková,
- *icPoint: Interactive Night Sky Observation* – project was awarded by Top Talent Quality Seal at the Europrix Top Talent Award 2007, team: Michal Dobiš, Vladimír Hlaváček, Linh Hoang Xuan, Michal Jajcaj, Dušan Lamoš supervised by A. Kovárová,
- *Bloodlezzz* – project was awarded by the price of Czechoslovak Section IEEE and Best Poster Award at the IIT.SRC 2008, team: Sašo Kiselkov, Bianka Kováčová, Martin Kozmon, Lenka Litvová, Michal Poláčík, Jakub Teleř supervised by A. Kovárová,
- *Laser Pointer Map Interaction* – bachelor project, team: Viktor Mészáros, Andrej Zelman supervised by A. Kovárová.

### 4.3 Publications

Results of our research were published in 193 papers, which represents an increase in comparison with 2007. 146 scientific contributions were published in conference proceedings, 64 out of which were published in reviewed proceedings of international conferences. 24 scientific contributions were published in scientific journals and we have authors (co-authors -editors) of 9 books.

FIIT STU is a co-publisher of the international scientific journal “Computing and Informatics” (until 2001 Computers and Artificial Intelligence). Two faculty staff members, P. Návrat and V. Kvasnička were members of its editorial board in 2008. Moreover, the faculty participates in editorial boards of seven other international journals and three national journals.

<i>Number of publications in 2008</i>	UAPI <sup>4</sup>	UI SI	UPSS	FIIT
Parts of books and textbooks published by international/national publisher	5/1	1/1	1/-	7/2
Scientific works published in international/national scientific journals	5/2	14/0	1/2	20/4
Scientific works published in international conference proceedings	37	20	7	64
Scientific works published in national or local conference proceedings	27	49	6	82
Conference proceedings editors	3	6	-	9
Published reviews	-	5	-	5

<i>Overview of other most significant activities in 2008</i>	UAPI	UI SI	UPSS	FIIT
Membership in editorial boards of scientific journals	8	2	2	12
Membership in programme committees of international scientific conferences	15	27	6	48
Membership in programme committees of national scientific conferences	1	11	1	13
Membership in steering committees of scientific conferences	0	4	-	4

#### 4.4 Research Projects

Research projects constitute an important basis for research realization and research funding. Life cycle of a research project includes its preparation, submission, acceptance of the project followed by the project realization. Because these periods take often several years, activities in certain period influence significantly results in the following period.

Projects of the Scientific Grant Agency of the Ministry of Education and the Slovak Academy of Sciences (VEGA) and of the Slovak Research and Development Agency (APVV) formed an essential form of research organisation and scientific projects funding at the FIIT STU. In 2008 four VEGA projects were completed and five were progressed. Two APVV projects were completed in 2008, and one other progressed. One project of the Cultural and Educational Grant Agency of the Ministry of Education of Slovak Republic (KEGA) progressed in 2008 and one other was prepared for funding in 2009-2011. Mentioned projects are described in reports of institutes presented in the following parts.

The Faculty under the leadership of P. Návrat and V. Rozinajová participated in two international projects, under the leadership of M. Šperka in one international project and under the leadership of P. Čičák in one international project.

In 2008 all three institutes of the Faculty together with six other institutes of the University and the Institute of Informatics Slovak Academy of Sciences participated in preparation of

<sup>4</sup> UAPI – Institute of Applied Informatics, UI SI – Institute of Informatics and Software Engineering, UPSS – Institute of Computer Systems and Networks

the project for Call of the Agency of the Ministry of Education for the Structural funds of the European Union under the Operational Programme Research and Development. This infrastructure research project called Centre of excellence for Smart technologies, systems and services with overall budget approx. 40 mil. SKK was approved.

<i>Number of projects funded in 2008</i>	UAPI	UISI	UPSS
VEGA	5	2	2
KEGA	-	1	-
APVV	1	2	-
State programmes of research and development	-	1	-
European Social Funds	-	-	1
International projects	1	2	1
<b>FIIT STU</b>	<b>7</b>	<b>8</b>	<b>4</b>

<i>Overview of funds (in thousands SKK)</i>	UAPI	UISI	UPSS	SUM
VEGA	1 493	1 242	414	3 149
KEGA		736	-	736
APVV	62	1 028	-	1 090
State programmes of research and development	-	125	-	125
International projects	69	90	11	170
<b>FIIT STU</b>	<b>1 624</b>	<b>3 221</b>	<b>425</b>	<b>5 270</b>

The projects were realized in research laboratories (description can be found in the parts devoted to individual institutes). In 2008 the following laboratories were operated:

- Laboratory of Database Technologies, manager: V. Vojtek,
- Intelligent Systems Laboratory, manager: P. Návrat,
- Advanced Software and Web Technologies Laboratory, manager: M. Bieliková,
- Computer Networks Laboratory I, II, manager: P. Čičák,
- Embedded Systems Laboratory, manager: T. Krajčovič,
- Laboratory of Intelligent Embedded Systems, manager: Š. Kozák,
- Laboratory of Modelling and Simulation, manager: Š. Kozák,
- VLSI Design Laboratory, manager: J. Hudec,
- Digital Systems Description and Design Laboratory, manager: K. Jelemenská,
- Grid Computing Laboratory, manager: L. Hudec.

Prof. Mária Bieliková  
Vice-Dean for Research



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## 5 National and International Relations

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Cooperation of FIIT STU can be characterised from several viewpoints as cooperation with secondary schools, other higher education institutions, research institutes and cooperation with industry (a list of cooperating institutions can be found in the parts devoted to individual institutes).

### 5.1 Cooperation with Secondary Schools

Cooperation with secondary schools lies in preparation for study at the university especially at the FIIT STU, organising a programming contest for secondary school students ProFIIT (P. Trebatický, contest director), and in technical cooperation. Technical cooperation with secondary schools is achieved especially through the Networking Academy programme. FIIT STU, as the Regional Networking Academy, guarantees publicity, programme quality, guidance of Local Academies, and regular technical training and consultations for teachers/instructors of secondary schools. In this way the Faculty leads, methodologically supervises and technically trains 20 secondary schools. In 2008 our faculty participated on the second annual set of CiscoOlymp2008 contest. One of the very successful activities is yearly organised Open Day.

### 5.2 Cooperation with Industry

Cooperation with industry is oriented towards training and consultation activities and educational cooperation.

#### Training and Consultation Activities

FIIT STU has been very successful in training and consultations in cooperation with the companies Cisco System Slovakia Ltd., GTEC Ltd., and Microsoft Slovakia Ltd. In cooperation with Cisco the Faculty has been integrated into the world-wide academy programme oriented to training in network technologies. Nowadays FIIT STU Regional Networking Academy offers a full 4-semester programmes CCNA (Cisco Certified Networking Associate) and CCNP (Cisco Certified Networking Professional).

Except above mentioned programmes FIIT STU offers programmes for IP Telephony, WiFi Communication, Network Security and other special courses.

In co-operation with GTEC Common Training and Consultation Centre (CTCC) offers various programmes. The main purpose of this centre is to offer technical training for the non-academy sphere.

### **Educational Cooperation**

In the field of education and other activities the Faculty has been cooperating with important Slovak companies for many years. Academy training programmes were developed thanks to the support of cooperation with Cisco Systems Slovakia Ltd., Soitron Ltd., Siemens Enterprise Communications Ltd., DITEC Ltd., DATALAN Ltd., ASSECO Slovakia Ltd., HP Slovakia Ltd, Goldstein Fuchs, Tempest Ltd.

Some of above mentioned companies have directly co-operated in Faculty education.

Other remarkable support the Faculty has obtained in cooperation with IBM Slovakia, Microsoft Slovakia, SIEMENS, GRATEX, ACCENTURE, Q-Products. Cooperation with the above mentioned companies is based on special agreements.

### **5.3 Mobility programmes**

FIIT STU is using the cooperation within the mobility programme LLP/Erasmus. In year 2008, this programme was contracted with these European universities:

- KaHo Sint-Lieven University, Gent, Belgium
- Angel Kunchev University of Rousse, Bulgaria
- Faculty of Information Technologies, Technical University in Brno, Czech Republic
- University of Southern Denmark, Odense, Denmark
- University of Aarhus, Denmark
- Tallinn University of Technology, Estonia
- Lahti University of Applied Sciences, Finland
- EPITA, Graduate School of Computer Science and Advanced Technologies, Paris, France
- ISEP, Graduate school of Engineers in Computer Engineering, Electronics, Telecommunications and Network, Paris, France
- The Nordakademie, Elmshorn, Germany
- Ruhr-University, Bochum, Germany
- Leipzig University, Germany
- Vienna University of Technology, Austria
- Faculty of Electrical Engineering and Computer Science, University of Maribor, Slovenia
- Faculty of Engineering, Mondragón University, Spain
- Technical university of Madrid, Spain
- Catalunya Technical University, Barcelona, Spain
- University of Alcalá, Spain
- Växjö University, Sweden
- University of Calabria, Italy

In 2008, 7 incoming Erasmus students have visited FIIT STU. In 2008, 7 students of our faculty were approved for Erasmus-mobility abroad for various destinations and 6 teachers has visited France, Great Britain and Belgium.

Besides the LLP/Erasmus agreements, a special agreement of cooperation is established with the Institut Supérieur d'Electronique de Paris (ISEP). Based on this agreement, students from ISEP were visiting FIIT STU for the training period of 1 month (July) to do their mandatory students' internship. In summer 2008, we hosted 8 students from ISEP.

Assoc. Prof. Pavel Čičák  
Vice-Dean for Public Relations

Juraj Štefanovič, PhD.  
Socrates Erasmus Coordinator





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## 6 Faculty Services

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### 6.1 Information and Library Services

Centre for Information and Library Services at the Faculty of Informatics and Information Technologies (CIKS) provides information services for study and research purposes at FIIT STU.

The book catalogue contains more than 6 000 items, which are freely available in the Library. The catalogue can be found on <http://olib.cvt.stuba.sk>. The Centre for Information and Library Services purchased and acquired thanks to donation 40 titles of professional journals (mainly ACM, IEEE membership) in various languages (5 out of them are in Slovak). Journals and selected books are located in the Study Room.

The information services make available, within the FIIT STU environment, 12 external electronic databases (Science Direct, ACM Digital Library, EEE Computer Society Digital Library, EI Engineering Village 2, EIFL Direct – EBSCO host, IoP Electronic Journals, Journal Citation Report, Oxford Reference Online, The Scientific World, Web of Science, Willey Encyclopaedia of Electrical and Electronics Engineering), include several fulltext accesses.

The Centre for Information and Library Services also covers loan of the books and magazines and lending basic assistance besides information search.

### 6.2 Computing and Communication Services

The Centre for Computing and Communication Services at the Faculty of Informatics and Information Technologies provides the following services for educational and research purposes at FIIT STU:

- functioning of the Faculty computer network,
- new computers, printers, scanners etc. installation,
- operation systems and specialized software installation,
- upgrading and maintenance of computers,
- services for faculty wire and wireless access points to the Internet,
- functioning of the camera security system,
- functioning of the IP telephony system,
- data-projectors installation.

The Faculty computer network is based on a structured cable system and it is using 100 Mbps transfer speed. It consists of approximately 170 personal computers and notebooks of the faculty staff and PhD students, 190 personal computers and workstations in the education and research laboratories and 30 specialized servers.

The Centre for Computing and Communication Services also provides full service for educational computer laboratories and full or partial service for research laboratories of the institutes.

Assoc. Prof. Tibor Krajčovič  
Head of Centre for Computing and Communication Services

Prof. Štefan Kozák  
Vice-Dean for Material Resources

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## 7 Institute of Applied Informatics

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**E-mail:** uapi@fiit.stuba.sk  
**Web:** uapi.fiit.stuba.sk  
**Tel:** +421 2 654 22 707  
**Fax:** +421 2 654 20 587

The institute specializes in the area of applied informatics. The scientific and professional activities of the institute concentrate mainly on the area of database systems, data mining, information processing in distributed environment of intelligent agents; further topics of interest lay in the area of computational intelligence (neural networks, evolutionary algorithms, artificial life, simulation of social systems), in intelligent embedded systems in control, and in application of computer graphics in virtual reality systems and in systems of enhanced reality, in visualization and human – computer interaction.

The institute is responsible for the following degree programmes:

- Informatics (master degree),
- Applied informatics (doctoral degree).

### 7.1 Staff

#### Director

Vladimír Vojtek, Professor

#### Deputy Director

Vladimír Kvasnička, Professor

#### Administrative Department

Katarína Pribišová

#### Teaching Staff

Miroslav Galbavý

Štefan Kozák, Professor

Vladimír Kvasnička, Professor

Jana Parížková

Jiří Pospíchal, Professor

Branislav Steinmüller (part time)

Ondrej Strnád, PhD. (part time)

Martin Šperka, Assoc. Professor (part time)  
 Juraj Štefanovič, PhD.  
 Vladimír Vojtek, Professor

#### Researchers

Ján Cigánek  
 Michal Čerňanský, PhD.  
 Matej Makula  
 Viliam Solčány (part time)

#### Full time PhD Students

Peter Angelovič  
 Peter Drahoš  
 Ľuboš Fazekaš  
 Martin Hinka  
 Peter Kapec  
 Alena Kovárová  
 Juraj Laca  
 Peter Lacko  
 Miroslav Makýš  
 Tomáš Selnekovič  
 Juraj Števek  
 Peter Trebatický  
 Matúš Uherčík  
 Oľga Zemanovičová

## 7.2 Teaching

### Undergraduate Study (Bc.)

Course	Semester	Credits	Lecturer
Algebra and Discrete Mathematics	Autumn	6	V. Kvasnička, J. Pospíchal
Human-Computer Interaction	Autumn	6	M. Šperka
Database Systems	Spring	6	V. Vojtek
IT Security Management	Spring	5	O. Strnád
Mathematical Logic I	Autumn	6	V. Kvasnička
Operating Systems	Autumn	6	J. Štefanovič
Modelling and Simulation	Autumn	6	Š. Kozák

### Master Study (Ing.)

Course	Semester	Credits	Lecturer
Advanced Database Systems	Autumn	5	V. Vojtek
Computer Graphics	Autumn	5	M. Šperka
Multimedia Computer Systems	Spring	5	M. Šperka

Course	Semester	Credits	Lecturer
Evolutionary Algorithms	Spring	5	J. Pospíchal
Neural Networks	Autumn	5	M. Čerňanský
Operating Systems Design	Spring	5	J. Štefanovič
Security and Management of Information Systems	Autumn	5	O. Strnád

### 7.3 Theses

#### Bachelor (Bc.) Theses

- Adámek, Adam: *Automatic test from data processing*. May 2008. Supervisor: M. Makula
- Antal, Andrej: *Plugin for Total Commander*. May 2008. Supervisor: P. Trebatický
- Backstuber, Tomáš: *Classification system based on random forest*. May 2008. Supervisor: P. Angelovič
- Bakiča, Marián: *Electronic dartboard*. May 2008. Supervisor: M. Čerňanský
- Bartalos, Tomáš: *Application for mobile devices*. May 2008. Supervisor: M. Čerňanský
- Chovanec, Vladimír: *Possibilities and techniques of efficiency data selection in database systems*. May 2008. Supervisor: M. Hinka
- Čapla, Robert: *Simulation and modelling of problems in internet*. May 2008. Supervisor: J. Štefanovič
- Daniš, Pavol: *Web based application for teaching*. May 2008. Supervisor: J. Parížková
- Dávid, Michal: *Multimedia information in the regional information system*. May 2008. Supervisor: M. Galbavý
- Farkas, Bálint: *Computing intelligence on automobile factory*. May 2008. Supervisor: J. Pospíchal
- Fillo, Peter: *Electronic target*. May 2008. Supervisor: M. Čerňanský
- Fridrich, Peter: *News portal*. May 2008. Supervisor: P. Jurčovič
- Frivaldský, Dalibor: *Support for visual programming in GLSL*. May 2008. Supervisor: P. Drahoš
- Gyurkovics, Norbert: *Optimization of decision trees with evolutionary algorithms*. May 2008. Supervisor: P. Angelovič
- Halaš, Marián: *Modeling and simulation of internet activities*. May 2008. Supervisor: J. Štefanovič
- Hudec, Vladimír: *Stochaistic optimization by metaphor of chemostat*. May 2008. Supervisor: V. Kvasnička
- Jakubéci, Martin: *Interactive manipulation of 3D graphs*. May 2008. Supervisor: P. Kapec

- Jurský, Stanislav: *Tomography of cross-section paper*. May 2008.  
Supervisor: J. Pospíchal
- Katona, Ján: *Visualization hypergraph representation of software*. May 2008.  
Supervisor: P. Kapec
- Kašuba, Mário: *The use of Qt library in simple scripting languages*. May 2008.  
Supervisor: P. Kapec
- Kollár, Juraj: *Development of web sites using XML and transformation languages*.  
May 2008. Supervisor: A. Kovárová
- Komloši, Juraj: *Data security in databases*. May 2008. Supervisor: M. Hinka
- Kottman, Michal: *The use of Qt framework in simple scripting languages*.  
May 2008. Supervisor: P. Kapec
- Kršák, Rastislav: *Development of web pages using XML and transformation  
languages*. May 2008. Supervisor: A. Kovárová
- Lackovič, Pavol: *Graphic editor of arms*. May 2008. Supervisor: V. Vojtek
- Lysina, Anton: *Evolutional programming cellular automata*. May 2008.  
Supervisor: V. Kvasnička
- Ľudvík, Martin: *Interactive 3D-graphs manipulation*. May 2008.  
Supervisor: P. Kapec
- Marcinka, Marek: *System for support of building optimal exam schedule*.  
May 2008. Supervisor: M. Galbavý
- Marton, Karol: *Knowledge discovery in databases and data mining*. May 2008.  
Supervisor: M. Hinka
- Marton, Jakub: *Optimistic synchronization for paralel simulation*. May 2008.  
Supervisor: V. Solčány
- Masaryk, Rastislav: *Parallel Independent Replicated Simulation in a Computer  
Cluster Environment*. May 2008. Supervisor: V. Solčány
- Michlík, Pavel: *Computer equipment management support*. May 2008.  
Supervisor: B. Steinmüller
- Miloňová, Daniela: *Graphic editor of arms*. May 2008. Supervisor: V. Vojtek
- Molnár, Lukáš: *Ants in hill climbing*. May 2008. Supervisor: J. Pospíchal
- Nagy, Ladislav: *Simulated annealing for solving combinatorial problems*.  
May 2008. Supervisor: V. Kvasnička
- Ochodnický, Daniel: *Interaction anatomical atlas*. May 2008. Supervisor:  
M. Šperka
- Oravec, Vladimír: *Computing intelligence at motor-car races*. May 2008.  
Supervisor: J. Pospíchal
- Pavlík, Daniel: *Modelling internet activities*. May 2008. Supervisor: J. Štefanovič
- Perašín, Matej: *Internet content management system*. May 2008.  
Supervisor: Š. Babinec

- Repka, Lukáš: *Creation of an intelligent agent using symbolic approach of artificial intelligence*. May 2008. Supervisor: P. Lacko
- Repáň, Viliam: *System for supporting creation of term schedules*. May 2008. Supervisor: M. Galbavý
- Sirota, Martin: *Automatic documentation and metrics generation from source codes*. May 2008. Supervisor: P. Kapec
- Smíšek, Michal: *Multimedia education via internet*. May 2008. Supervisor: A. Kovárová
- Szabó, Gabriel: *Vision-based hand-position recognition*. May 2008. Supervisor: J. Štefanovič
- Šurek, Tomáš: *Protection of database*. May 2008. Supervisor: J. Parížková
- Tomek, Jozef: *Total Commander plug-in*. May 2008. Supervisor: P. Trebatický
- Ukrop, Ľuboš: *New approaches in graph visualization*. May 2008. Supervisor: P. Kapec
- Virik, Martin: *News portal*. May 2008. Supervisor: P. Jurčovič

#### Master Theses

- Bachratý, Viktor: *Image recognition using RBF neural networks*. May 2008. Supervisor: P. Lacko
- Darula, Martin: *Distributed simulation environment based on Web3D technology*. May 2008. Supervisor: M. Šperka
- Ďurajka, František: *Collaborative information system*. May 2008. Supervisor: V. Vojtek
- Ďuriš, Jozef: *Millennium project*. May 2008. Supervisor: V. Vojtek
- Eliáš, Juraj: *Utilization of graphical units on artificial neural networks*. May 2008. Supervisor: P. Drahoš
- Gregor, Michal: *Telemedicine system*. May 2008. Supervisor: V. Vojtek
- Hirjak, Ondrej: *Real-time fluid simulation on GPU*. May 2008. Supervisor: P. Drahoš
- Hlaváček, Vladimír: *Telemedicine system*. May 2008. Supervisor: V. Vojtek
- Hoang, Xuan Linh: *Telemedicine system*. May 2008. Supervisor: V. Vojtek
- Hornák, Lubomír: *Home care health care system*. May 2008. Supervisor: V. Vojtek
- Jajcaj, Michal: *Simulation and animation of photorealistic hair in real time*. May 2008. Supervisor: P. Drahoš
- Jakuš, Miroslav: *Dynamic optimisation by colony of ants*. May 2008. Supervisor: J. Pospíchal
- Kišac, Ivan: *Facial animation and visualised speech*. May 2008. Supervisor: P. Drahoš
- Kohaut, Peter: *Virtual world based on peer to peer network*. May 2008. Supervisor: P. Drahoš

- Košťál, Michal: *Support of effective work with multimedia information*. December 2008. Supervisor: M. Galbavý
- Kušnir, Štefan: *The gathering of additional information for timetable creation*. May 2008. Supervisor: M. Galbavý
- Kútny, Martin: *Modeling user behaviour characteristics for identification*. December 2008. Supervisor: V. Vojtek
- Lajoš, Eubomír: *Collaborative environment for multi-agents shared information*. May 2008. Supervisor: J. Štefanovič
- Lamoš, Dušan: *Usage of multimedia content in traffic information systems*. December 2008. Supervisor: M. Galbavý
- Makýš, Miroslav: *Modeling and discrete control of compressor systems*. May 2008. Supervisor: J. Štefanovič
- Mirc, Roman: *Visualization and communication library for automation control systems*. May 2008. Supervisor: M. Čerňanský
- Mišák, Peter: *Application of neural networks to the symmetrical pair game strategy creation*. May 2008. Supervisor: P. Lacko
- Okresa, Michal: *Tool for automated testing of applications with the graphical user interface*. May 2008. Supervisor: V. Solčány
- Ondáč, Stanislav: *Data integration in enterprise environment*. December 2008. Supervisor: M. Galbavý
- Rendek, Ladislav: *Data visualization in nonlinear space*. December 2008. Supervisor: P. Kapec
- Rodák, Roman: *Fuzzy algorithms for modelling and control of mechatronic systems*. May 2008. Supervisor: Š. Kozák
- Selnekovič, Tomáš: *Design and implementation of a non-axiomatic reasoning system*. May 2008. Supervisor: V. Kvasnička
- Stanček, Martin: *System for design and administration of arms*. December 2008. Supervisor: V. Vojtek
- Staník, Juraj: *Influence of Hebbian learning on the optimization of Echo state networks*. May 2008. Supervisor: J. Pospíchal
- Szeliga, Branislav: *Fuzzy-neural algorithms for modelling and controlling processes in transport*. May 2008. Supervisor: Š. Kozák
- Székely, Ondrej: *Parallel game-tree search*. May 2008. Supervisor: P. Lacko
- Šupina, Peter: *Subsidiary information gaining and using in timetable creation*. May 2008. Supervisor: M. Galbavý
- Valachovič, Peter: *Stochastic optimization of decision trees*. December 2008. Supervisor: P. Angelovič
- Vrba, Pavol: *Module for visual analysis of C/C++ language*. May 2008. Supervisor: J. Žiak



**Doctoral (PhD.) Theses**

- Student name:* Peter Trhan  
*Degree program:* Applied informatics, part time  
*Thesis title:* *The application of neural networks in environmental modelling*  
*Supervisor:* Vladimír Vojtek, Professor  
*Defended on:* December 11, 2008  
*Annotation:* Artificial neural networks have a wide range of applications nowadays in which they are used for intelligent information processing. This PhD dissertation deals with an application of spiking neural networks for environmental models of man-made scenes. The implemented spiking neural networks have been adapted to the modeled environment through autonomous interaction with the scene environment. The topology of the spiking neural networks has been developed through a modified genetic algorithm. Since the genetic algorithm did not use a crossover operator we adapted the mutation operator adding a constraint that prevented creation of a new generation of population with weak individuals in comparison with the previous generation of population. The dissertation proposes a parallel combination of local, both left and right spiking neural networks as well as a practical implementation of this proposition in the form of an intelligent navigation system in an autonomous mobile robot. This design enhances the implemented navigation system with a new cognitive property of intelligent information processing using a spiking neural network. Having adapted to the modeled environment, the navigation system was able to make right decisions, change its direction and refrain from collision with the scene walls.
- Student name:* Viliam Solčány  
*Degree program:* Software engineering, part time  
*Thesis title:* *The lookahead in user transparent conservative parallel simulator*  
*Supervisor:* Jiří Šafařík, Professor  
*Defended on:* June 30, 2008  
*Annotation:* This work is in the area of parallel discrete event simulation. The dissertation presents a simulator design, which contributes to solve the complexity issues at both modeling and simulation levels. Its modeling approach supports a component oriented model design and implementation, thereby simplifying the construction of complex models. At the same time, it allows to use a library of components suitable for parallel simulation. In this way, the difficulties inherent to parallel simulation can be hidden from a user. We consider the conservative approach to parallel simulation, which is known to heavily rely on the lookahead. The components for parallel simulation include the lookahead. With such components as the basic building elements, we seek to enhance the overall lookahead of large scale models where many components are simulated by the same processor. The enhancement is based on combining the lookahead properties of co-located components, resulting in a cumulative lookahead. Our major contribution is an in-depth investigation of the cumulative lookahead, and development of the associated algorithms and methods. This includes

methods for cumulative prediction of future timestamps and cumulative message pre-sending. In the experimental part of the thesis, we verify the simulator design and evaluate the performance contribution of the developed methods. The results show that the cumulative look-ahead can lead to significant performance improvement.

## 7.4 Research Laboratories

### Laboratory of Database Technologies

*Manager:* V. Vojtek

*Contact:* vladimir.vojtek@stuba.sk

*Description:* The laboratory is oriented towards support of research tasks, which use in some stages of solution a database environment, or which deal with security issues of database and information systems. Further application is in database application including multimedia applications, Global Information Systems, on-line transaction processing, on-line analytical processing, data-mining, data warehouses, internet access to databases, applications of CASE systems. The laboratory is equipped with SUN Enterprise 250 server and tens of SunRay workstations and some PC's. Software equipment includes database environment Oracle 8.1.6, MySQL, PostgreSQL, MS SQL Server, and Progress v8.

### Laboratory of Intelligent Embedded Systems

*Manager:* Š. Kozák

*Contact:* stefan.kozak@stuba.sk

*Description:* The aim of the laboratory is the development of advanced soft techniques and principles and their broad and far-reaching applications to practical embedded systems in industries. In the Laboratory of Intelligent Embedded Systems researchers are developing smart systems and transmitters, electronic devices, and control-and-decision-making software and algorithms to empower embedded systems performance using artificial intelligence methods. The big challenge of the research work in the laboratory is to develop efficient methods and software and hardware tools which can be used in industries to enhance the product design process, make time-to-market shorter and improve overall quality of the final products.

### Laboratory of Modelling and Simulation

*Manager:* Š. Kozák

*Contact:* stefan.kozak@stuba.sk

*Description:* The laboratory is oriented towards support of teaching modelling, simulation and control, using mainly Matlab and Simulink with various toolboxes for intelligent control, life fuzzy, neural and evolutionary toolboxes. It provides advanced research and education program in development of novel approaches and their applications in modelling, simulation and control of continuous-time, discrete-time, discrete events and hybrid systems. The education is adapted to the current demand of the industries in Slovakia (power industry, gas and car in-

dustries, health care, banking) and aims to training specialists to be able to cope with today's problems and to design appropriate solutions. Various basic and applied research projects dealing with challenging interdisciplinary problems are solved in this laboratory.

## 7.5 Research Projects

### **Information infrastructure for embedded knowledge processing in distributed environment (VEGA, 1/3103/06)**

*Project leader:* V. Vojtek  
*Members:* V. Kvasnička, M. Šperka, J. Štefanovič, M. Galbavý, J. Parížková, B. Steinmüller, P. Angelovič, P. Drahoš, M. Hinka, P. Kapec, A. Kovárová, O. Zemanovičová  
*Supported by:* Scientific Grant Agency of the Ministry of Education of Slovak Republic and the Slovak Academy of Sciences  
*Duration:* January 2006 – December 2008  
*Description:* The goal of the project is a conceptual design of methods and tools for modelling and simulation of information infrastructure aimed to gather, store, process and present knowledge, which is scattered in a distributed environment of internet and various kinds of information, mobile and satellite networks. The next goal is implementation of information infrastructure subsystems, where it will be possible to organize knowledge into structures (on the basis of data mining methods) for knowledge processing, storing, presentation and visualization with help of augmented reality systems and multimedia tools. In this process the knowledge will be easily comprehensible for users. A pilot application will be targeted at e-learning and intelligent infrastructures. The presented goals are compatible with the strategic priorities of 7th EU Research Framework Programme.

### **Study of co-evolution between genes and memes using artificial life methods and replicator theory (VEGA, 1/0804/08)**

*Project leader:* V. Kvasnička  
*Members:* J. Pospíchal, Š. Babinec, E. Fazekaš, J. Laca, P. Lacko, P. Trebatický  
*Supported by:* Scientific Grant Agency of the Ministry of Education of Slovak Republic and the Slovak Academy of Sciences  
*Duration:* January 2008 – December 2010  
*Description:* Evolutionary methods of artificial life and replicator theory will be used to study co-evolution between genes and memes. A population will be composed of complexes built from one gene and one meme: the complex will be called an m-gene. The propagation of m-genes in the population will be based on following three elementary operations: replication (m-gene is replicated onto another m-gene - a descendent, which may contain a mutated version of the parental m-gene; interaction (a memetic transfer from a donor to an acceptor) and extinction (m-gene is eliminated out of the population). By computational simulations "in silico" we shall study a co-evolution between memes and genes and identify various mechanisms of evolution of memes in po-

pulation. The results of this study will enable to identify various mechanisms of social learning in multiagent systems, during which a transfer of knowledge is carried out from one agent to another.

### **Intelligent Embedded Systems (IVS) (VEGA, 1/0822/08)**

*Project leader:* Š. Kozák  
*Members:* V. Vojtek, T. Krajčovič, J. Štefanovič, M. Čerňanský, J. Flochová, P. Čičák, M. Galbavý, B. Hruz, J. Parížková, M. Šperka, P. Angelovič, P. Drahoš, L. Fazekaš, J. Laca, R. Valo  
*Supported by:* Scientific Grant Agency of the Ministry of Education of Slovak Republic and the Slovak Academy of Sciences  
*Duration:* January 2008 – December 2010  
*Description:* The project consists of three interconnected parts: (i) development of methods and tools for intelligent synthesis of complex systems including continuous-time and discrete-event dynamics; (ii) development of information and communication software tools and systems providing intelligent and real-time communication and control operation; (iii) development of application hardware and software modules of intelligent embedded software systems applicable in various processes (transportation, industry, health care, banking and service business).

### **Connectionist Computational Models for Computer Grid Environment (VEGA, 1/0848/08)**

*Project leader:* M. Čerňanský  
*Members:* J. Pospíchal, Š. Babinec, D. Bernát, M. Makula  
*Supported by:* Scientific Grant Agency of the Ministry of Education of Slovak Republic and the Slovak Academy of Sciences  
*Duration:* January 2008 – December 2010  
*Description:* Common feedforward neural networks are a successful approach of artificial intelligence. Specialized recurrent neural networks were proposed to process structured data such as sequences, trees or graphs. Despite the high application potential of the latter type of neural networks, they have not yet become a widely used and accepted approach. The high computational requirements of these advanced training approaches have prevented recurrent networks to become widespread and generally accepted computing devices.

### **Application of neural networks with echo states to time series prediction (VEGA, 1/4053/07)**

*Project leader:* J. Pospíchal  
*Members:* V. Kvasnička, P. Lacko, P. Trebatický, Š. Babinec, O. Zemanovičová, M. Čerňanský, L. Fazekaš, J. Laca  
*Supported by:* Scientific Grant Agency of the Ministry of Education of Slovak Republic and the Slovak Academy of Sciences  
*Duration:* January 2007 – December 2009  
*Description:* The goal of the project is a study of a modern approach to recurrent neural networks, which is exceptionally suitable for a prediction of time series. Neural network in this case contains a block of neurons

with a recurrent architecture, which is randomly generated and its weight coefficients are fixed during the learning of the network. Our preliminary numerical results show, that by an application of an incremental learning we can achieve an adapted neural network with Echo states, which has then substantially better generalization ability. The proposed project will be aimed at a study of assorted methods of incremental learning of these networks and their application to prediction of time series produced in finance, energy industry, etc.

**Theoretical studies and applications of neural networks with “echo states” in artificial intelligence and cognitive science (APVT-20-002504)**

*Project leader:* V. Kvasnička  
*Members:* J. Pospíchal, M. Čerňanský, Š. Babinec, J. Babjak, P. Lacko, M. Makula, P. Sarkoci, P. Trebatický  
*Supported by:* Slovak Research and Development Agency  
*Duration:* January 2005 – June 2008  
*Description:* The study of neural networks with echo states, which are currently considered as one of the greatest innovations of neural networks towards the increase of their biological plausibility. The project studies micro-neural structures containing several hundreds of neurons, while the adaptation will affect only the connections between hidden and output neurons with 1-step learning methods. Time in these networks will be discrete, which allows also a simple introduction of a communication by spikes on synaptic connections between neurons. The model will be an important tool for modelling of reasoning processes and classification in artificial intelligence and cognitive science.

**Joint Degree in Media Development Engineering (Erasmus, 29079-IC-1-2005-1-DK-ERASMUS-PROGUC-3)**

*Project leader:* M. Šperka for STU  
*Contractor:* Eva Sorum Poulsen, Herning Institute of Business Administration and Technology, Denmark  
*Countries:* BE, DE, FI, IS, PL,  
*Supported by:* Socrates programme of the European Commission,  
*Duration:* October 2006 – September 2009  
*Description:* By STU participating, this project will promote curriculum development and student/staff mobility. It will also allow STU to extend the use of ECTS, and will fulfil the institution’s aim to teach in English. It will provide STU students with a solid foundation to be able to compete on an international basis, and will ensure that the level and contents of the study are equivalent to those of the partners.

## 7.6 Publications

### Journals

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- ČERŇANSKÝ, M., TIŇO, P.: Predictive Modelling with Echo State Networks. In: *Lecture Notes in Computer Science*. ISSN 0302-9743. Vol. 5163 Artificial Neural Networks ICANN 2008, Part I, 2008, Springer Berlin/Heidelberg. pp. 778-787.
- MAKULA, M., BEŇUŠKOVÁ, L.: Analysis and Visualization of the Dynamics of Recurrent Neural Networks for Symbolic Sequences Processing. In: *Lecture Notes in Computer Science*. ISSN 0302-9743. Vol. 5164 Artificial Neural Networks - ICANN 2008, Part II, Springer Berlin/Heidelberg 2008. pp. 577-586.
- LACKO, P., KVASNIČKA, V.: Mixture of Expert Used to Learn Game Play. In: *Lecture Notes in Computer Science*. ISSN 0302-9743. Vol. 5163, Artificial Neural Networks - ICANN 2008, Part I, Springer Berlin/Heidelberg 2008. pp. 225-234.
- PARÍZKOVÁ, J., HLUCHÝ, O.: Characteristics of Web Browsers. In: *Technológia vzdelávania*. Vol. XVI. No. 3, 2008, pp. 14-15. (in Slovak)
- PARÍZKOVÁ, J., BERNAŤÁK, I.: Integrated Development Environment for Creating of Low Level Programs. In: *Informatika v škole*. No. 33/34, 2008. Bratislava, ISSN 1335-616X, pp. 4-9. (in Slovak)
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### International Conferences

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- ČERŇANSKÝ, M., HABALA, M.: Novel Recurrent Connectionist Approaches. In: *Cybernetics and Informatics*. International Conference. Ždiar, Slovak Republic, 2008. CD-ROM.
- ČERŇANSKÝ, M., NEHÉZ, M., CHUDÁ, D., POLICKÝ, I.: On Using of Turing Machine Simulators in Teaching of Theoretical Computer Science. In: *Aplimat 2008*, 7<sup>th</sup> International Conference. Bratislava, Slovak Republic. pp. 917-927.
- ČERŇANSKÝ, M., TIŇO, P.: Processing Symbolic Sequences Using Echo-State Networks. In: *From Associations to Rules. Connectionist Models of Behaviour and Cognition*. Proceedings of the Tenth Neural Computation and Psychology Workshop, Dijon, France, World Scientific Publishing Co.Pte.Ltd, 2008. pp. 153-164.
- CHVOSTEK, T., KOZÁK, Š.: Design of Communication Subsystem for the Hybrid Vehicles. In: *Cybernetics and Informatics*. International Conference. Ždiar, Slovak Republic, 2008. CD-ROM.
- CIGÁNEK, J., KOZÁK, Š.: Robust Controller Design Using Algebraic Theory. In: *2<sup>nd</sup> International Conference on Advanced Control Circuits & Systems (ACCS'08)*. Cairo, Egypt, Cairo ERI 2008. CD-ROM.
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- CIGÁNEK, J., KOZÁK, Š.: Robust Controller Design Using Algebraic Theory for Unstable Systems. In: *2<sup>nd</sup> International Conference on Advanced Control Circuits & Systems (ACCS'08)* Cairo, Egypt, Cairo ERI 2008. CD-ROM.
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- GUZMICKÝ, P., KOZÁK, Š.: Methodology for embedded systems applications with freescale processors. In: *Cybernetics and Informatics*. International Conference. Ždiar, Slovak Republic 2008. CD-ROM. (in Slovak)
- KAJAN, S., KOZÁK, Š.: Modelling of Nuclear Power Engineering Process Using Artificial Neural Networks. In: *Cybernetics and Informatics*. International Conference. Ždiar, Slovak Republic 2008. CD-ROM. (in Slovak)
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- KOZÁK, Š.: Development of Advanced Control Methods and Their Successful Incorporation in the Industry. In: *2<sup>nd</sup> International Conference on Advanced Control Circuits & Systems (ACCS'08)*, Cairo, Egypt, Cairo ERI 2008. CD-ROM.
- KOZÁK, Š.: New trends in integration of information, communication and control technologies. In: *Cybernetics and Informatics*. International Conference. Ždiar, Slovak Republic, 2008. CD-ROM. (in Slovak)
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- KVASNIČKA, V.: Model Logic in Informatics and Artificial Intelligence. In: *Cybernetics and Informatics*. International Conference. Ždiar, Slovak Republic, 2008. CD-ROM.
- OKRESA, M., SOLČÁNY, V.: Ascella - A Framework for Automated Testing of GUI Applications. In: *Software Engineering Techniques in Progress*, The 3<sup>rd</sup> IFIP TC2 Central and East European Conference on Software Engineering Techniques, *CEESET 2008*, Brno, Wrocław, Oficyna Wydawnicza Politechniki Wrocławskiej 2008. pp. 167-175.
- PAULUSOVÁ, J., KOZÁK, Š., DÚBRAVSKÁ, M.: Fuzzy Logic Autotuning Methods for PID Controller. In: *Process Control 2008*, Proceedings of the 8<sup>th</sup> International Scientific-Technical Conference. Kouty nad Desnou, Czech Republic, 2008. CD-Rom.

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- ŘIKOVSKÝ, V., KOZÁK, Š.: CMAC and HCMAC Neural Network Control of Redundant Robot. In: *2<sup>nd</sup> International Conference on Advanced Control Circuits & Systems (ACCS'08)*, Cairo, Egypt, Cairo ERI 2008. CD-ROM.
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- SZABÓ, G.: Vision-Based Hand Position Recognition. In: *Spring Conference on Computer Graphics: SCCG 2008 in cooperation with Eurographics and ACM SIGGRAPH*, Budmerice, 2008. pp. 36-37.
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- SEKERKA, R.: Open Problems in Artificial Life. In: *Cognition and Artificial Life VIII*. Silesian University in Opava, 2008. pp. 273-277. (in Slovak)
- SELNEKOVIČ, T.: Nonaxiomatic reasoning system NARS. In: *Cognition and Artificial Life VIII*. Silesian University in Opava, 2008. pp. 279-293. (in Slovak)
- SOLČÁNY, V.: The Lookahead in a User-Transparent Conservative Parallel Simulator. In: *Memics 2008*. 4<sup>th</sup> Doctoral Workshop on Mathematical and Engineering Methods in Computer Science, Znojmo, Brno, 2008. pp. 266.

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ZEMANOVIČOVÁ, O.: Visualization of Large Graphs. In: *Student Research Conference 2008*. 4<sup>th</sup> Student Research Conference in Informatics and Information Technologies Bratislava, Supervisor: M. Šperka, 2008. pp. 230-234.

### Parts of Books

BOBRÍK, M., KVASNIČKA, V., POSPÍCHAL, J.: Artificial Chemistry and Molecular Darwinian Evolution of DNA/RNA-Like Systems I. In: *Studies in Computational Intelligence*. Vol. 85 Comp. Intelligence in Medical Informatics. 2008. pp. 295-336.

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KVASNIČKA, V.: Kripkes Semantic Model of Possible Worlds. In: *Models of mind*. Bratislava, 2008. pp. 127-145. (in Slovak)

KVASNIČKA, V., POSPÍCHAL, J.: Theory of Cooperative Coevolution of Genes and Memes. Chapter III. In: *Reflexing Interfaces: The Complex Coevolution of Information Technology Ecosystems*. Hershey New York Inf. Science Ref., 2008. 33-45.

POSPÍCHAL, J., KVASNIČKA, V.: In Silico Simulation of Ethnic Conflicts. In: *Models of mind*. Bratislava, 2008. pp. 160-178. (in Slovak)

### Textbooks

KVASNIČKA, V., POSPÍCHAL, J.: *Algebra and Discrete Mathematics*. Bratislava STU, 2008. ISBN 978-80-227-2934-5, pp. 493. (in Slovak)

## 7.7 Cooperation

### Cooperation in Slovakia

- Faculty of Mathematics, Physics and Informatics, Comenius University in Bratislava
- Faculty of Electrical Engineering, Technical University of Košice
- Ministry of Economy of the Slovak Republic
- Alfa Base Ltd., Bratislava
- Kybernetika Ltd., Košice
- Research Institute of Nuclear Power Engineering Inc., Trnava
- Schneider Electric Slovakia Ltd.
- Start Automation Ltd., Malacky

- Termoreg Ltd., Bratislava

### **International Cooperation**

- University of Zagreb, Croatia
- Institute of Software Technology and Interactive Systems, Vienna University of Technology, Austria
- Institute Supérieur d'Electronique de Paris (I.S.E.P.), Paris, France
- Institute Central European Initiative in Cognitive Science Education (joining universities in Vienna, Budapest, Zagreb and Bratislava)
- Faculty of Philosophy and Science, Silesian University in Opava
- Faculty of Informatics, Humboldt University in Berlin
- Rockwell Automation – Allen Bradley, USA
- Schneider Electric Deutschland, Germany
- Brno University of Technology, Czech Republic
- Technical University of Liberec, Czech Republic
- Technical University of Ostrava, Czech Republic

### **Visits of Staff Members**

- *Š. Kozák*: Conference on Advanced Control Circuit Systems ACCS'08, Cairo, Egypt, March 30 – April 2, 2008
- *Š. Kozák*: International Carpathian Control Conference, Sinaia, Romania, May 25-28, 2008
- *M. Galbavý*: JDMDE project meeting, Lahti, Finland, May 14-17, 2008
- *V. Kvasnička*: Cognition and Artificial Intelligence programming committee meeting, Prague, Czech Republic, April 25-27, 2008
- *V. Kvasnička, J. Pospíchal, M. Čerňanský, P. Lacko, T. Selnekovič, P. Trebatický, V. Bachratý, R. Sekerka*: Cognition and Artificial Intelligence 2008, Prague, Czech Republic, May 26-29, 2008
- *J. Štefanovič*: EPITA, Graduate School of Computer Science and Advanced Technologies, Paris, France, May 24-31, 2008
- *M. Čerňanský, M. Makula, P. Lacko, P. Trebatický*: ICANN 2008 – Int. Conference on Artificial Neural Networks, Prague, Czech Republic, September 3-8, 2008
- *J. Pospíchal*: MENDEL 2008, Brno, Czech Republic, June 17-20, 2008
- *Š. Kozák*: ECCAI 2008, Patras, Greece, July 22 – 26, 2008
- *V. Kvasnička*: Kognice 2008, Hradec Králové, Czech Republic, September 18-19, 2008
- *V. Solčány*: CEE – SET 2008, Brno, Czech Republic, October 13-15, 2008
- *M. Galbavý, J. Štefanovič*: Katholieke Hogeschool, Sint Lieven, Ghent, Belgium, October 13-19, 2008

- *M. Čerňanský*: INNS-NNN 2008 Symposia, ICONIP 2008, Auckland, New Zealand, November 17 – December 6, 2008
- *V. Solčány*: MEMICS 2008, Znojmo, Czech Republic, November 14-16, 2008
- *A. Kovárová, P. Mindek*: Vienna University of Technology, Vienna, Austria, November 27, 2008
- *A. Kovárová*: SMAP 2008, Prague, Czech Republic, December 15-19, 2008

## 7.8 Membership in Professional Organisations and Societies

### Slovak Professional Organisations and Societies

The whole institute is a collective member of Slovak Artificial Intelligence Society.

#### *Štefan Kozák*

- Slovak Society for Cybernetics and Informatics at Slovak Academy of Sciences (member since 1970, chairman since 1998)

#### *Vladimír Kvasnička*

- Slovak Academic Society (founding member, since 1997)
- Slovak Artificial Intelligence Society (chairman, since 2000)
- Slovak Computer Science Society (member, since 1996)

#### *Jiří Pospíchal*

- Slovak Artificial Intelligence Society (member, since 2000)
- Slovak Computer Science Society (member, since 1996)

#### *Martin Šperka*

- Slovak Society for Informatics (member, since 2006)

### International Professional Organisations and Societies

#### *Michal Čerňanský*

- INNS, International Neural Network Society (member, since 2006)

#### *Štefan Kozák*

- IFAC, member of the Technical Committee on Linear Control Systems
- ECCAI European Coordination Committee for Artificial Intelligence (member since 1996, member of National Board)
- IFAC, International Federation of Automatic Control Technical Committee (member of Technical Committee TC 2.2. Linear Control Systems, TC 3.1. Computers for Control, TC 3.2. Cognition and Control)
- IEEE, Institute of Electrical and Electronic Engineers (member since 1998)

#### *Vladimír Kvasnička*

- IEEE, Institute of Electrical and Electronic Engineers (member since 2008)

*Peter Lacko*

- IEEE, Institute of Electrical and Electronic Engineers (member since 2008)

*Jiří Pospíchal*

- EUROFUSE, EURO Working group on fuzzy sets (member, since 1999)
- IEEE, Institute of Electrical and Electronic Engineers (member since 2008)

*Viliam Solčány*

- ACM, Association for Computing Machinery (member, since 2004)

*Martin Šperka:*

- EADIM, European Academy of Digital Media (fellow, since 2001), Instructors Network (vice chairman, since 2003)

*Peter Trebatický*

- IEEE, Institute of Electrical and Electronic Engineers (member, since 2005)

**7.9 Other Activities**

- Artificial Intelligence Seminar organization  
[www.fiit.stuba.sk/~kvasnicka/Seminar\\_of\\_AI](http://www.fiit.stuba.sk/~kvasnicka/Seminar_of_AI)
- Journal of Computing and Information Technology – V. Vojtek (since 1993), V. Kvasnička (since 2005): members of advisory board
- MATCH Communications in Mathematical Chemistry – V. Kvasnička (since 1998): member of advisory board
- Neural Network World – V. Kvasnička (since 2001): member of advisory board
- Journal Cybernetics and Informatics – Š. Kozák: editor in chief
- Croatica Chimica Acta – V. Kvasnička (since 2002): member of advisory board
- Publishing House Pergamon Press – Š. Kozák: member of editorial board
- Computing and Informatics (CAI) – V. Kvasnička: member of editorial board
- APVV, Slovak Research and Development Agency – Š. Kozák, member of committee for technical sciences
- ITI 2008 – 30<sup>th</sup> International Conference on Information Technology Interfaces, Dubrovnik – V. Vojtek: member of programme committee
- Cognition and Artificial Life VIII, Prague – V. Kvasnička: member of programme committee
- MENDEL 2008 – 14<sup>th</sup> International Conference on Soft Computing, Prague, Czech Republic – V. Kvasnička, J. Pospíchal: members of programme committee
- SCCG 2008 – Spring Conference on Computer Graphics, Budmerice castle, Slovakia – M. Šperka: member of programme committee
- CESC 2008 – Central European Seminar on Computer Graphics, Budmerice castle, Slovakia – M. Šperka: member of programme committee
- WEBIST 2008 – 4<sup>th</sup> International Conference on Web Information Systems, Madeira, Portugal – M. Šperka: member of programme committee

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- VU 2008 – 9<sup>th</sup> International Conference Virtual University, Bratislava, Slovakia – M. Šperka: member of programme committee
  - ICANN 2008 – 18<sup>th</sup> International Conference on Artificial Neural Networks, September 3-6, 2008, Prague, Czech Republic, V. Kvasnička: member of programme committee
  - SSKI 2008, International Conference on Cybernetics and Informatics, Belianske Tatras – Š. Kozák: programme committee chair, V. Kvasnička, V. Vojtek: members of programme committee
  - SAMI 2008, 6<sup>th</sup> International Symposium on Applied Machine Intelligence and Informatics, Herľany, – Š. Kozák, V. Kvasnička: members of programme committee
  - ACCS 2008, 2<sup>nd</sup> International Conference on Advanced Control Circuits & Systems, Cairo, Egypt – Š. Kozák: member of programme committee
  - ICCS 2008, International Carpathian Control Conference, Sinaia, Romania – Š. Kozák: member of programme committee





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## 8 Institute of Computer Systems and Networks

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**E-mail:** upss@fiit.stuba.sk  
**Web:** upss.fiit.stuba.sk  
**Tel:** + 421 2 654 22 707  
**Fax:** + 421 2 654 20 587

The Institute of Computer Systems and Networks offers undergraduate and graduate study programmes covering a broad range of courses in *Computer Engineering*. Our courses are built on sound theoretical fundamentals and are oriented towards developing independent creative thinking and ability to design solutions or to solve complex problems in the field of engineering expertise.

These courses cover basics and principles of mathematics, physics, basics and computing, and concentrate mostly on the following domains: computer architecture, distributed systems and computer networks, design of digital systems, embedded systems.

The institute is responsible for education in the accredited degree programmes at each of the three levels of university education:

- Computer Systems and Networks (bachelor degree),
- Computer Systems and Networks (master degree),
- Computer Systems and Networks (doctoral degree).

The institute has been active and successful in research and reflects in research the current development of computer engineering in the world. Our research is funded by grants from the Slovak Research Grant Agency and European Social Fund.

The dominant research interests of the institute include: design of digital systems and embedded systems, computer networks, creation of a novel effective formal specification tools, identification and implementation of automated engineering tasks in the area of HW/SW co-design of the mobile computing systems, development of new algorithms and methodology for providing reliability and fault tolerance, development of new approaches and methods for security enforcement in distributed systems and elaboration of new methodology for VLSI system design and testing at the functional level that is applicable for integrating into ASIC and PLD design.

## 8.1 Staff

### Director

Ladislav Hudec, Assoc. Professor

### Deputy Director

Katarína Jelemenská, PhD.

### Administrative Department

Katarína Pribišová

### Teaching Staff

Pavel Čičák, Assoc. Professor

Boris Dado

Jana Flochová, PhD.

Elena Gramatová, Assoc. Professor (part time)

Igor Grellneth, PhD.

Pavol Horváth, Professor (part time)

Branislav Hruz, Assoc. Professor

Ján Hudec

Ladislav Hudec, Assoc. Professor

Katarína Jelemenská, PhD.

Milan Kolesár, Professor

Ivan Kotuliak, PhD.

Margaréta Kotočová, Assoc. Professor

Tibor Krajčovič, Assoc. Professor

Elena Tomalová

Peter Trúchly, PhD.

### Researchers

Adrian Bagala

Dušan Bernát

Jamal Hasan, PhD.

Daniela Kotmanová

Michal Vrabel

### Full time PhD Students

Jaroslav Abaffy

Tomáš Kováčik

Mária Pohronská

## 8.2 Teaching

### Undergraduate Study (Bc.)

Course	Semester	Credits	Lecturer
Computer Architecture	Spring	6	M. Kolesár
Computer Engineering Principles and Practice	Autumn	6	M. Kolesár

<b>Course</b>	<b>Semester</b>	<b>Credits</b>	<b>Lecturer</b>
Computer Engineering Principles	Autumn	4	M. Kolesár
Computer Application Methods	Spring	6	P. Čičák
Computer Networks I	Spring	6	M. Kotočová
Computer Networks II	Autumn	6	I. Grellneth
Convergence of Mobile and Wired Networks	Autumn	6	I. Kotuliak
Engineering Methods	Autumn	4	P. Čičák
Final Bachelor Project I-II	Autumn Spring	3-9	L. Hudec, M. Kolesár
Machine and System Level Programming	Autumn	5	P. Čičák
Microcomputers	Autumn	6	T. Krajčovič
Peripheral Devices	Spring	4	P. Horváth
Programmable Logic	Spring	6	M. Kolesár
Specification and Description Languages	Autumn	6	K. Jelemenská
WAN Technologies	Spring	6	I. Grellneth

**Master Study (Ing.)**

<b>Course</b>	<b>Semester</b>	<b>Credits</b>	<b>Lecturer</b>
Communication Services and Networks	Autumn	5	M. Kotočová
Computer Systems Architecture	Autumn	4	L. Hudec
Computer Systems Architecture - Project	Autumn	1	L. Hudec
Computing Systems Research	Autumn	1	M. Kolesár
Computing Systems Security	Autumn	5	L. Hudec
Diagnostics and Reliability	Spring	5	E. Gramatová
Digital Systems Design	Spring	5	K. Jelemenská
Digital Systems Testing	Autumn	5	E. Gramatová
Diploma Project I (Computer Systems and Networks)	Spring	4	M. Kolesár
Diploma Project II (Computer Systems and Networks)	Autumn Spring	10 10	L. Hudec M. Kolesár
Diploma Project III (Computer Systems and Networks)	Autumn Spring	21	M. Kolesár
Distributed Computer Systems	Autumn	5	D. Bernát
Embedded Systems	Autumn	5	T. Krajčovič
Event Systems	Spring	5	B. Hruz
Internet Security	Spring	5	L. Hudec
NGN Networks, Services and Protocols	Autumn	5	I. Kotuliak
Reconfigurable Digital Systems	Spring	5	J. Flochová

Course	Semester	Credits	Lecturer
Team Project I-II (Computer Systems and Networks)	Autumn Spring	5-6	J. Hudec
Wireless Telecommunication Systems	Spring	5	I. Kotuliak

### 8.3 Theses

#### Bachelor (Bc.) Theses

- Adamica, Ján: *Penetration testing of WLAN*. May 2008. Supervisor: L. Hudec
- Andruška, Igor: *Program system for creation and reduction of ordered binary decision diagrams*. May 2008. Supervisor: D. Kotmanová
- Balažia, Ján: *System for remote administration of workstations*. May 2008. Supervisor: D. Bernát
- Beleš, Lukáš: *Tools for support programming web services for Globus Toolkit*. May 2008. Supervisor: M. Zimen
- Bielik, Martin: *Multimedia teach course of VHDL language*. May 2008. Supervisor: K. Jelemenská
- Černák, Celestín: *The creation of activity model of basic functional unit of information processing in cerebral context*. May 2008. Supervisor: P. Hupka
- Choleva, Michal: *Programming algorithms for supervisor management in Java*. May 2008. Supervisor: J. Flochová
- Fekete, Martin: *Experimental microcomputer based on AT89S52*. May 2008. Supervisor: T. Krajčovič
- Gajdoš, Ján: *The description of VHDL language*. May 2008. Supervisor: J. Hasan
- Gula, Štefan: *Software switch with STP support*. May 2008. Supervisor: I. Grellneth
- Horváth, Štefan: *Proxy management in Grid*. Supervisor: A. Bagala
- Hrubý, Martin: *Measuring and evaluating performance parameters in computer networks*. May 2008. Supervisor: M. Kotočová
- Hrubý, Michal: *Means to support teaching of ASPI subject*. May 2008. Supervisor: P. Čičák
- Hupka, Šimon: *Factoring big numbers*. May 2008. Supervisor: J. Hasan
- Huska, Peter: *Programming of algorithms for simulation of behaviour events system*. May 2008. Supervisor: J. Flochová
- Hájek, Vladimír: *Graphical display of instruction execution in simulator*. May 2008. Supervisor: L. Hudec
- Jančík, Roman: *Forensic tools for digital evidence collection*. Supervisor: L. Hudec
- Januš, František: *Testing system based on analysis and playback of captured packet data from real systems*. May 2008. Supervisor: P. Mader
- Kelemen, Tomáš: *Putting the IP multimedia subsystem into service*. May 2008. Supervisor: I. Kotuliak

- Koine, Peter: *Tools for support of tuition of the subject ASP4*. May 2008. Supervisor: P. Čičák
- Kopecký, Peter: *Model of brain cortex activation*. May 2008. Supervisor: P. Hubka
- Košút, Miroslav: *Software system for computer networks education*. May 2008. Supervisor: D. Malina
- Lojan, Tomáš: *Programming algorithms for supervisory control in Java*. May 2008. Supervisor: J. Flochová
- Mach, Michal: *Reliable data storage*. May 2008. Supervisor: D. Bernát
- Marko, Michal: *Multimedia learning module for SystemC*. May 2008. Supervisor: K. Jelemenská
- Marko, Peter: *Means to support teaching of ASP3 subject*. May 2008. Supervisor: P. Čičák
- Martinský, Ladislav: *Program system to support education of Petri Nets – HTML application*. May 2008. Supervisor: E. Tomalová
- Michalec, Vladimír: *Implementation of IP Multimedia Subsystem network*. May 2008. Supervisor: I. Kotuliak
- Mišenčík, Marek: *Online simulator logical circuit – OS Windows application*. May 2008. Supervisor: E. Tomalová
- Mořovský, Emil: *Debugger for systems on the base of Intel 8051*. May 2008. Supervisor: T. Krajčovič
- Mészáros, Viktor: *GT4 LiveCD*. May 2008. Supervisor: M. Zimen
- Nosko, Peter: *Big integer factorization*. May 2008. Supervisor: J. Hasan
- Nosáľ, Michal: *Replaying packets and archiving packet scenarios*. May 2008. Supervisor: Ľ. Ševcech
- Olšovský, Michal: *Testing of network interface card's extended MAC layer and design in PLD environment*. May 2008. Supervisor: J. Hudec
- Rada, Tomáš: *Finite state machine and their exploitation to describe behaviour of synchronous sequential circuit – HTML application*. May 2008. Supervisor: E. Tomalová
- Sakhia, Orgil: *Cerebral cortex activation model*. May 2008. Supervisor: P. Hubka
- Schusterová, Zuzana: *Multicast and its practice utilization*. May 2008. Supervisor: D. Malina
- Sedláček, Matúš: *Penetration testing of WLAN*. May 2008. Supervisor: L. Hudec
- Skalný, Ján: *Penetration testing of WLAN*. May 2008. Supervisor: L. Hudec
- Slamka, Daniel: *Design and implementation hardware core, described in VHDL, for communication with peripherals*. May 2008. Supervisor: M. Baláž
- Špaček, Pavol: *Additional support for monitoring computer networks*. May 2008. Supervisor: D. Bernát
- Štiglic, Filip: *System for the support of remote workstations maintenance*. May 2008. Supervisor: D. Bernát

- Šuvada, Martin: *The software support of teaching of the subject ASP2*. May 2008. Supervisor: P. Čičák
- Tkačov, Peter: *Graphic represent of state space in verification digital systems by modelchecking method*. May 2008. Supervisor: D. Kotmanová
- Tkáč, Stanislav: *Experimental microcomputer based on AT89S52*. May 2008. Supervisor: T. Krajčovič
- Tomovič, Ivan: *Comparision of written documents*. May 2008. Supervisor: B. Dado
- Turoň, Ján: *Visualization of system C language design*. May 2008. Supervisor: K. Jelemenská
- Valent, Adam: *Program assistance to evaluate radioamateur contests*. May 2008. Supervisor: D. Malina
- Valko, Tomáš: *Measuring and evaluating Quality of Service parameters in TCP/IP Networks*. May 2008. Supervisor: M. Kotočová
- Varga, Richard: *Multimedial learning module for Petri nets*. May 2008. Supervisor: K. Jelemenská
- Vrábel, Marek: *Visualisation of processes in a Grid*. May 2008. Supervisor: M. Zimen
- Zatloukal, Michal: *Program system for graphical expansion of the oriented stte-transmission graph into an analytical tree (parse-tree)*. May 2008. Supervisor: D. Kotmanová
- Zelman, Andrej: *Activation model of cerebral cortex*. May 2008. Supervisor: P. Hubka

### Master Theses

- Abaffy, Jaroslav: *External interrupts in different operating systems*. May 2008. Supervisor: T. Krajčovič
- Angelovič, Stanislav: *Measurement of Quality-of-Service parameters in TCP/IP networks*. May 2008. Supervisor: M. Kotočová
- Bachratý, Ondrej: *Filesystem metadata backup*. May 2008. Supervisor: D. Bernát
- Bachtík, Oliver: *Penetration testing of web servers*. May 2008. Supervisor: L. Hudec
- Bebej, Stanislav: *Design of special functions of network adapter in PLD environment*. December 2008. Supervisor: J. Hudec
- Fillo, Peter: *Support for analysis of problems in computer networks*. May 2008. Supervisor: D. Bernát
- Hovanec, Pavol: *Functional test generator of VLSI circuits*. May 2008. Supervisor: J. Hudec
- Hvizdák, Bohuslav: *Security of user group access in Grid*. May 2008. Supervisor: A. Bagala
- Jalec, Peter: *The Design and implementation of a system for graphic visualization of pipelining*. May 2008. Supervisor: J. Hudec

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- Kaleta, Dávid: *State Machine Visual Editor*. May 2008. Supervisor: B. Dado
  - Kočár, Marek: *Functional test generator for VLSI Circuits*. May 2008.  
Supervisor: J. Hudec
  - Makový, Michal: *Platform independent distributed data processing*. May 2008.  
Supervisor: R. Kubaščík
  - Maslenová, Zuzana: *Persistent processes in UNIX*. May 2008.  
Supervisor: D. Bernát
  - Mesjar, Peter: *Services in next generation networks*. May 2008.  
Supervisor: I. Grellneth
  - Mikula, Michal: *Software support for simulation of chosen ARQ methods*.  
May 2008. Supervisor: D. Malina
  - Mrva, Ivan: *System for supporting learning of cache*. May 2008.  
Supervisor: E. Tomalová
  - Novák, Michal: *Integration heterogeneous environments in central data warehouse*.  
May 2008. Supervisor: M. Matejka
  - Ondrovič, Michal: *Security of the job assigning in GRID*. May 2008.  
Supervisor: A. Bagala
  - Palkovič, Martin: *Monitor for EMP386EX*. May 2008. Supervisor: T. Krajčovič
  - Petráš, Juraj: *Visualization of VHDL model*. May 2008. Supervisor: K. Jelemenská
  - Pohronská, Mária: *Experimental musical instrument with MIDI output*. May 2008.  
Supervisor: T. Krajčovič
  - Pristach, Juraj: *Intelligent data backup*. May 2008. Supervisor: M. Horváth
  - Schwandner, Tomáš: *IPv6 security - theory and practice*. May 2008.  
Supervisor: I. Grellneth
  - Staňo, Miroslav: *Filtering of unsolicited bulk messages in electronic messaging systems*.  
May 2008. Supervisor: M. Pikula
  - Szabó, Štefan: *Educative CACHE simulating system, application for Windows OS*.  
May 2008. Supervisor: E. Tomalová
  - Szabó, Matej: *Monitoring network problems on attached workstations*. May 2008.  
Supervisor: L. Keszegh
  - Štulrajter, Radko: *Support for analyzing problems in computer networks*.  
May 2008. Supervisor: D. Bernát
  - Vrábel, Michal: *Simulator of communication in computer networks*. May 2008.  
Supervisor: B. Dado
  - Zubal, Michal: *Visualization of VHDL description*. May 2008.  
Supervisor: K. Jelemenská
  - Žiak, Jaroslav: *Router configuration education system*. May 2008.  
Supervisor: K. Jelemenská

## 8.4 Research Laboratories

### Computer Networks Laboratory I.

*Manager:* P. Čičák  
*Contact:* pavel.cicak@stuba.sk  
*Description:* The research and teaching laboratory is predefined for teaching Computer networks I and Computer networks II to undergraduates in the study programme Computer systems and networks. The students are to show their practical and theoretical skills. They are involved in design, implementation and verification of applications for computer networks. They are trained to install, configure and operate local and wide-area networks. The laboratory is equipped with computers connected to the Internet and modern network components and respective software tools necessary to gain practical skills in the area of computer networks.

### Computer Networks Laboratory II.

*Manager:* P. Čičák  
*Contact:* pavel.cicak@stuba.sk  
*Description:* The research and teaching laboratory predefined for teaching WAN technologies to undergraduates, communication services and networks and distributed computer systems to graduates in the study programme Computer systems and networks. Students are to gain and prove their practical and theoretical skills. The skills are developed that enable students to design, implement, and troubleshoot scalable local and wide-area networks, create and deploy a global intranet, using routers and switches for multiprotocol client hosts and services. Students are also involved in design, implementation and verification of applications for computer networks and parallel processing. The laboratory is equipped with computers, Internet connection, newest modern network components and necessary software tools.

### Embedded Systems Laboratory

*Manager:* T. Krajčovič  
*Contact:* tibor.krajcovic@stuba.sk  
*Description:* The research and teaching laboratory is predefined for teaching embedded systems, microprocessors and microcomputers, computer interfacing and digital equipment construction to undergraduates in the study programme Computer Systems and Networks, orientation in Computer Engineering. The students are to prove practical and theoretical skills. They are involved in design, implementation and verification of the applications for microprocessors and other digital devices in real-time applications. The laboratory is equipped with modern computers with internet connection and other hardware and software components and tools (logic analyzer, in-circuit emulators, Bluetooth development kits, Pentium II based embedded system development kit) necessary for practical teaching.



### **VLSI Design Laboratory**

*Manager:* J. Hudec  
*Contact:* jan.hudec@stuba.sk  
*Description:* The research and teaching laboratory is predefined for teaching of programmable logic devices in graduate study of Computer systems and networks, branch Computer engineering. The students are targeted for proving practical and theoretical skills. They are involved in design, implementation and verification of applications for programmable logic and gate arrays. The laboratory is equipped with modern computers with internet connection and other hardware and software components and tools (XACT for XILINX, SYNOPSYS) for programmable circuits PLD and FPGA practical teaching.

### **Digital Systems Description and Design Laboratory**

*Manager:* K. Jelemenská  
*Contact:* katarina.jelemenska@stuba.sk  
*Description:* The research and teaching laboratory is predefined for teaching specification and description languages to undergraduates and digital systems design, computer systems architecture and reconfigurable digital systems to graduates in the study programme Computer systems and networks. Students are to prove their practical and theoretical skills. They are involved in design, description, implementation and verification of small to medium digital system. Laboratory is equipped with modern computers connected to the Internet, RC10 boards and necessary software tools to gain practical skills in the area of digital systems design – FPGA Advantage and DK Design Suite.

### **Grid Computing Laboratory**

*Manager:* L. Hudec  
*Contact:* ladislav.hudec@stuba.sk  
*Description:* The research and teaching laboratory is devoted to teaching distributed processing and parallel programming graduate modules and experimental lab for project on Grid Computing and its components. Grid consists of two independent parts. The first part is testing grid equipped 20 CPUs, 1Gb network interconnection, front-end server with UPS and Globus Toolkit software. The second part is production grid equipped 40 CPUs, 1Gb network connection, front-end server with UPS and Globus Toolkit software. Grid is connected to Internet and is going to be as a part of SlovakGrid national grid structure.

## **8.5 Research projects**

### **Grid computing systems and its components (VEGA, 1/3104/06)**

*Project leader:* L. Hudec  
*Members:* M. Kolesár, I. Grellneth, B. Hruz, M. Kotočová, T. Krajčovič, K. Jelemenská, J. Hudec, E. Tomalová, J. Hasan, P. Čičák, B. Dado, D. Kotmanová, D. Bernát, A. Bagala, J. Flochová

*Supported by:* Scientific Grant Agency of the Ministry of Education of Slovak Republic and the Slovak Academy of Sciences  
*Duration:* January 2006 – December 2008  
*Description:* Design and implementation an extension to the OS kernel providing checkpoint and restore mechanism to the processes (numeric extensive calculations) of operating system. Design and implementation of the distributed schedule algorithm that provide a node load balance in cluster based on neighbour node state knowledge. Cluster model development as random graph. Node and communication links failure analysis that influences communication in network (ability of message to reach the destination node) in dependence on link failure and network topology. The RBAC security model application in grid environment. Methodology development and implementation for scheduling steps of synthesis for design models. Development the search for design flows enabling smart design of digital systems.

**Mobile Education Center (HP Technology for Teaching Higher Education Grant Initiative 2007)**

*Project leader:* P. Čičák  
*Members:* D. Bernát, B. Dado, K. Jelemenská, M. Kotočová  
*Supported by:* Hewlett Packard  
*Duration:* September 2007 – August 2009  
*Description:* The main goal of the project is the education innovation by means of convenient utilization of capabilities, provided by the newest IT technologies, including mobile technology, into the learning environment. Thus one of the most important goals of a modern school is to be reached, that each graduate in its future job should be able to apply information and communication technologies. A mobile laboratory represents more effective way of exploitation existing technological equipment. The activities that does not require technological equipment, can take place in mobile laboratory.

**Pilot project for education of selected modern IT topics in lifelong education process using modern teaching methods (131201110125 - JPD 3/2005/2.1/01-48)**

*Project leader:* P. Čičák  
*Members:* K. Jelemenská, M. Kotočová, L. Hudec, I. Grellneth, B. Dado, T. Krajčovič  
*Supported by:* European Social Fund  
*Duration:* August 2006 – July 2008  
*Description:* The main goal of the project is to support the lifelong education process by offering education courses in the field of modern information technologies (IT) of different levels. Concrete aims: to complete and expand qualification of employees, enable to obtain practical experiences with the newest technologies, support rise of small and middle enterprises in the field of IT, improve erudition level of the employees of state and public administration in the field of IT, apply modern educational methods, to create materials for courses, to introduce information system of courses administration.

**Innovative communication technologies in metropolitan environment based on optical and wireless technology with focus on converged architectures (VEGA, 1/4084/07)**

*Project leader:* I. Kotuliak

*Members:* P. Trúchly, P. Podhradský, J. Polec, V. Olejček, K. Kotuliaková, J. Kotuliaková, T. Kováčik, F. Husák, M. Dúngel, R. Kadlic, S. Schumann.

*Supported by:* Scientific Grant Agency of the Ministry of Education of Slovak Republic and the Slovak Academy of Sciences

*Duration:* January 2007 – December 2009

*Description:* The goal of the project is the research in the area of high-speed metropolitan architectures based on optical technology with optical switching as well as in the area of convergence of metropolitan optical network with ad-hoc networks. In this context, the research team focuses besides architectures also on medium access protocols and on class of services with corresponding quality parameters. Among the most important research subjects of the project falls influence of deployed security methods on the throughput, and mainly routing which should ensure convergence with other types of network. The project research should be based on rich experience of the research team in the area of simulation and modelling. In this context, we define also parameters of prospective traffic in metropolitan and ad-hoc networks.

## 8.6 Publications

### Journals

BERNÁT, D.: Domain Name System as a Memory and Communication Medium. In: *Lecture Notes in Computer Science*. SOFSEM 2008: Theory and Practice of Computer Science, Vol. 4910, ISSN 0302-9743. Slovakia, Springer-Verlag Berlin Heidelberg 2008. pp. 560-571.

KOTMANOVÁ, D.: Temporal Logic in Verification of Digital Circuits. In: *Journal of Electrical Engineering*. Vol. 59, No. 1, 2008, ISSN 1335-3632, pp. 14-22.

POCTAVEK, J., TRÚCHLY, P.: Error Rate of Wireless Channel. In: *EE časopis pre elektrotechniku a energetiku*. Vol. 14, 2008, ISSN 1335-2547, pp. 232-236. (in Slovak)

### International Conferences

BELEŠ, Š., JELEMENSKÁ, K., JURIKOVIČ, M., PIŠTEK, P., POLÁK, T., ZEMAN, A., ŽUCHA, M.: Mobile Testing System. In: *ICETA 2008*, 6<sup>th</sup> International Conference on Emerging e-Learning Technologies and Applications. High Tatras, Slovak Republic. Košice Elfa 2008. pp. 133-138.

ČIČÁK, P., JELEMENSKÁ, K., DADO, B.: Mobile Education Centre. In: *ICETA 2008*, 6<sup>th</sup> International Conference on Emerging e-Learning Technologies and Applications. High Tatras, Košice Elfa 2008. pp. 245-250.

- CSÓKAS, E., ČIČÁK, P.: Dynamic Granularity Kernighan-Lee Partitioning Algorithm. In: *ICETA 2008*, 6<sup>th</sup> International Conference on Emerging e-Learning Technologies and Applications. High Tatras, Košice Elfa 2008. pp. 147-152.
- GRELLNETH, I., SCHWANDNER, T.: IPv6 Security Issues and Considerations, Duplicate Address Detection Mechanism Security Problem. In: *ICETA 2008*, 6<sup>th</sup> International Conference on Emerging e-Learning Technologies and Applications. High Tatras, Košice Elfa 2008. pp. 113-116.
- HÁJOVSKÝ, V., KOLULIAKOVÁ, K., KOTULIAK, I.: HARQ Schemes for HSDPA - Analysis and Simulation. In: *Proceedings Elmar-2008*, 50<sup>th</sup> International Symposium ELMAR-2008, Vol. 2, Zadar, Croatia, Zadar Croatian Society Electronics in Marine 2008. pp.557-560.
- HRÚZ, B.: Time Optimal Control of Automatic Guided Vehicles in the Manufacturing Systems. In: *Cybernetics and Informatics*. International Conference. Ždiar, Slovak Republic, 2008. CD-ROM.
- JURIKOVIČ, M., KRAJČOVIČ, T.: Remote Control of Cell Phone via Bluetooth Interface by Computer. In: *ICETA 2008*, 6<sup>th</sup> International Conference on Emerging e-Learning Technologies and Applications. High Tatras, Košice Elfa 2008. pp. 117-122.
- KNĚZEK, M.: Blending Routing Metrics for Optimization the Best Path Selection in Multiple Protocol Environment. In: *Cracow Grid Workshop'08*, Kraków, Cyfronet 2008, Poster Presentations.
- KOVÁČIK, T., KOTULIAK, I., PODHRADSKÝ, P.: Real-Time Traffic Analysis in Ethernet. In: *IWSSIP 2008*. 15<sup>th</sup> International Workshop on Systems, Signals and Image Processing. Bratislava, 2008. pp. 69-72.
- PODHRADSKÝ, P., KOTULIAK, I., MIKÓCZY, E.: New Trends in NGN Technologies and Network Platforms. In: *Proceedings Elmar-2008*, 50<sup>th</sup> International Symposium ELMAR-2008, Zadar, Croatia, Croatian Society Electronics in Marine 2008. Vol. 2, pp.539-544.
- ŠTRBA, A., KRAJČOVIČ, T.: Software Design Challenges for Self-sustaining Embedded Systems. In: *Applied Electronics 2008*, International Conference. Pilsen, Czech Republic, 2008. pp. 207-210.
- VARGIC, R., KRHLA, M., SCHUMANN, S., KOTULIAK, I.: IMS Interworking Using IBCF. In: *ICCIT 2008*. The 2008 International Conference on Convergence and Hybrid Information Technology, Busan, South Korea, Piscataway, IEEE Computer Society 2008. pp. 89-94.

#### **Local and National Conferences**

- BELEŠ, Š., JURIKOVIČ, M., PIŠTEK, P., POLÁK, T., ZEMAN, A., ŽUCHA, M., JELEMENSKÁ, K.: Mobile test system. In: *Technologies for e-learning*. Prague, 2008. pp. 37-43. (in Slovak)
- HUDEČ, L.: Web server security vulnerabilities and their testing. In: *Information Security 2008*, Bratislava, SASIB 2008. pp. 68-74.

- HVIZDÁK, B.: Community Authorization Service. In: *Student Research Conference 2008*. 4<sup>th</sup> Student Research Conference in Informatics and Information Technologies Bratislava, Supervisor: A. Bagala, 2008. pp. 404-411.
- JURIKOVIČ, M., PIŠTEK, P.: Remote Control of a Cell Phone by Computer via Bluetooth Interface. In: *ITAT 2008*, Information Technologies – Applications and Theory, Hrebienok, Seňa PONT s.r.o. 2008. pp. 53-56. (in Slovak)
- KNĚZEK, M.: Blending Individual Routing Metrics for Optimization the Best Path Selection in Multiple Routing Protocol Network Environment. In: *Student Research Conference 2008*. 4<sup>th</sup> Student Research Conference in Informatics and Information Technologies Bratislava, Supervisor: M. Kotočová, 2008. pp. 377-378.
- ONDROVIČ, M.: Security of Job Assigning in GRID Environment. In: *Student Research Conference 2008*. 4<sup>th</sup> Student Research Conference in Informatics and Information Technologies Bratislava, Supervisor: A. Bagala, 2008. pp. 420-426.
- ZIMEN, M.: Caching Credentials at User's Side. In: *Student Research Conference 2008*. 4<sup>th</sup> Student Research Conference in Informatics and Information Technologies Bratislava, Supervisor: L. Hudec, 2008. pp. 433-440.

### Parts of Books

- PODHRADSKÝ, P., MIKÓCZY, E., MATEJKA, J., LÁBAJ, O., TOMEK, R., ĎUNGEL, M., KOTULIAK, I.: Practical Experience with New Services and Applications Supported by NGN. In: *Handbook of Research on Mobile Multimedia*, Vol.1. Hershey Information Science Reference, 2008. pp. 628-645.

## 8.7 Cooperation

### Cooperation in Slovakia

- Institute of Informatics, Slovak Academy of Sciences, Bratislava
- Faculty of Electrical Engineering and Information Technology, Slovak University of Technology in Bratislava
- Faculty of Electrical Engineering and Information Technology, Technical University in Košice
- Regional Cisco Network Academy, Faculty of Electrical Engineering and Information Technology, Technical University in Košice,
- Faculty of Natural Sciences, Matej Bel University in Banská Bystrica
- Faculty of Management Science and Informatics, University of Žilina
- Faculty of Electrical Engineering, University of Žilina
- Regional Cisco Network Academy, Faculty of Management Science and Informatics, University of Žilina
- Faculty of Informatics, Bratislava School of Law
- Abonus Ltd.
- Asseco Slovakia Ltd.

- CISCO Systems Slovakia Ltd.
- Datalan Ltd.
- GTEC Ltd.
- Hewlett-Packard Slovakia Ltd.
- IBM Slovakia Ltd.
- Infostat Bratislava
- Molpir Ltd.
- Oracle Slovakia Ltd.
- Siemens Enterprise Communications Ltd.
- Soitron Ltd.
- Spinet Ltd.
- Tempest Ltd.
- Tronet Ltd.

#### **International Cooperation**

- Department of Computers, Faculty of Electrical Engineering, Czech Technical University in Prague, Czech Republic
- Faculty of Information Technologies, Brno University of Technology, Czech Republic
- Department of Computer Science and Engineering, Faculty of Applied Science, University of West Bohemia in Pilsen, Czech Republic
- Faculty of Computer Systems and Control, Technical University in Sofia, Bulgaria
- INRIA, Grenoble, France
- University of Maribor, Maribor, Slovenia
- Heinz Nixdorf Institut, Universität - GH Paderborn, Germany
- Microelectronic Systems Institute, TU Darmstadt, Germany
- Fraunhofer Institute for Integrated Circuits, Dresden, Germany

#### **Visits of Staff Members**

- *P. Čičák, B. Dado, K. Jelemenská*: 2008 HP Technology for Teaching Worldwide Higher Education Conference, San Diego, USA, February 11-22, 2008
- *T. Krajčovič*: University of T. Baťa, Zlín, Czech Republic, February 27, 2008
- *P. Čičák, B. Dado, K. Jelemenská*: EPITA, Graduate School of Computer Science and Advanced Technologies, Paris, France, May 24-31, 2008
- *M. Jurikovič, P. Pištek, T. Polák, J. Zeman*: Technology for e-learning - TPEV 2008, Prague, Czech Republic, May 29-31, 2008
- *J. Flochová*: Växjö University, Sweden, June 1-6, 2008
- *T. Krajčovič*: Applied Electronics 2008, Pilsen, Czech Republic, September 9-12, 2008

- *P. Čičák*: Int. Conference on ICT, Hong Kong, July 3-10, 2008
- *P. Čičák*: San José, USA, August 16-24, 2008
- *J. Flochová*: MATLAB 2008, Prague, Czech Republic, September 13-24, 2008
- *P. Trúchly*: project Leonardo, Portugal, September 3-6, 2009
- *I. Kotuliak, P. Trúchly*: ELMAR, Zagreb, Croatia, September 9-16, 2008
- *M. Knězek*: CGW 2008, Krakow, Poland, October 12-16, 2008
- *P. Trúchly*: FEL ČVUT, Prague, Czech Republic, November 6-8, 2008
- *L. Hudec*: COST meeting, Brussels, Belgium, November 23-25, 2008

## **8.8 Membership in Professional Organisations and Societies**

### **Slovak Professional Organisations and Societies**

#### *Pavel Čičák*

- Slovak Centre of the IET (member, since 1999)

#### *Ladislav Hudec*

- Slovak Association for Information Security (member, since 1996; president since 1998)
- Slovak Centre of the IET (member, since 1996; vice-president 1996-1998)
- Slovak Chapter of the ISACA (member, since 2002)

#### *Milan Kolesár*

- Slovak Centre of the IET (member, since 2001)
- Slovak Society for Computer Science (member, since 1995)

### **International Professional Organisations and Societies**

#### *Pavel Čičák*

- IET, Institute of Engineering and Technology (fellow, since 2000)
- ECUK, Engineering Council UK (Chartered Engineer, since 2000)

#### *Jana Flochová*

- IEEE, Institute of Electrical and Electronic Engineers (member, since 1998)

#### *Ján Hudec*

- New York Academy of Sciences, member (member, since 1997)

#### *Ladislav Hudec*

- Information Systems Audit and Control Association (member, since 1998)

#### *Tibor Krajčovič*

- Slovak Commission for UNESCO. Informatics, Information and Communication Technologies (member, since 2005)

### 8.9 Other Activities

- National COST Coordinator, L. Hudec (since 1993)
- Member of the COST Senior Officials Committee, L. Hudec (since 1993)
- Newsletter of Cisco Networking academy in Slovakia – P. Čičák, P. Mesjar: members of editorial board
- Information Security 2008, February 13, 2008, Bratislava – L. Hudec: member of programme committee
- ICETA 2008 – 6<sup>th</sup> International Conference on Emerging E-Learning Technologies and Applications, September 11-13 2008, Stará Lesná, High Tatras, Slovakia – P. Čičák: member of programme committee
- IWSSIP 2008 – 15<sup>th</sup> International Workshop on Systems, Signals and Image Processing, June 25-28, 2008, Bratislava, Slovakia – I. Kotuliak, P. Trúchly: members of programme committee
- NCM 2008 – 4<sup>th</sup> International Conference on Networked Computing and Advanced Information Management, Gyeongju, South Korea, September 2-4, 2008 – I. Kotuliak: member of programme committee
- ICCIT 2008 – International Conference on Convergence and Hybrid Information Technology, November 11-13, 2008, Busan, South Korea – I. Kotuliak: member of programme committee
- GCCP 2008 – 4<sup>th</sup> International Workshop on Grid Computing for Complex Problems, October 27-29, 2008, Bratislava, Slovakia – L. Hudec: member of programme committee



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## 9 Institute of Informatics and Software Engineering

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**E-mail:** uisi@fiit.stuba.sk  
**Web:** uisi.fiit.stuba.sk  
**Tel:** + 421 2 654 114 61  
**Fax:** + 421 2 654 205 87

The main mission of the Institute of Informatics and Software Engineering is to contribute to the mission of Slovak University of Technology and to the mission of the Faculty of Informatics and Information Technologies in the range of its competencies, in areas bounded by and related to informatics and software engineering. Among the related areas, it is oriented especially to artificial intelligence in research of knowledge approaches in solving problems of informatics and software engineering, and to information systems respecting their close relation to typical problem domains in software engineering.

Within the mission, the institute especially

- contributes through its research to development of knowledge in the areas of science and technologies belonging to the mentioned areas,
- provides successful and high-quality study programmes in areas of its competencies at each of the three levels of university education, in which
  - graduates with the first degree will be excellently prepared for Slovak and European labour market and will be able to take care of themselves in their own business and also to create employment opportunities to others,
  - graduates with the second degree will have acquired competencies and abilities to be leaders of specialist teams with deep expert knowledge and ability of high creativity,
  - doctoral study graduates will be able to bring new original and innovative solutions of complex problems.

The institute is responsible for education in the following accredited degree programmes:

- Informatics (bachelor degree),
- Information Systems (master degree),
- Software Engineering (master degree),

- Software Systems (doctoral degree),
- Artificial Intelligence (doctoral degree).

The Institute of Informatics and Software Engineering fulfils the mission by the research activities relevant both in a national and international context and by extending, deepening and improving the offer of courses provided to students at all the three levels of university studies.

The Institute endeavours actively to cooperate. It includes interdisciplinary research and studies at other similar institutes, institutions and departments of its Faculty, its University, in Slovakia, in Europe and throughout the world. In particular, in 2007 the Institute was invited to join the international consortium of research institutions devoted to *Web Intelligence*. The Institute represents Slovakia in the consortium and contributes to promoting research in Web Intelligence worldwide.

The Institute aims at becoming the leading Slovak institution in the areas of its competencies with ambitions to positively influence their development. The Institute is conscious of its high responsibility to the public and it provides expert services to it, thus improving life of the town, the region, the country and the mankind. The Institute looks for synergies with industry and enterprise community, and jointly tries to raise research and education quality in the areas of informatics and information technologies.

## 9.1 Staff

### Director

Pavol Návrat, Professor

### Deputy Director

Mária Bieliková, Professor

Viera Rozinajová, PhD.

### Administrative Department

Zuzana Macková

### Teaching Staff

Nadežda Andrejčíková (part time)

Mária Bieliková, Professor

Anna Bou Ezzeddine

Iveta Dekýšová

Marta Gnipová (part time)

Daniela Gregušová, Assoc. Professor (part time)

Nikoleta Habudová

Ľubica Hanulová (part time)

Daniela Chudá, PhD.

Ivan Kapustík

Dagmar Komorová (part time)

Gabriela Kosková, PhD.

Rastislav Královič, Assoc. Professor (part time)

Jana Minárová, Assoc. Professor (part time)

Marián Mlynarovič, PhD. (part time)

Vladimír Mlynarovič, Assoc. Professor (part time)  
Ľudovít Molnár, Professor  
Pavol Návrat, Professor  
Ivan Polášek, PhD. (part time)  
Ivan Polický (part time)  
Anna Považanová  
Viera Rozinajová, PhD.  
Tomáš Seidmann, PhD., visiting Assoc. Professor (part time)  
Jiří Šafařík, Professor (part time)  
Ľubor Šešera, PhD., visiting Assoc. Professor (part time)  
Valéria Šimáková (part time)  
Peter Tiňo, PhD., visiting Assoc. Professor (part time)  
Valentino Vranić, PhD.  
Michal Winczer, PhD. (part time)

#### **Researchers**

Roman Filkorn (part time)  
Tomáš Chvostek  
Marián Knězek (part time)  
Marián Lekavý  
Marek Tomša (part time)  
Richard Veselý (part time)  
Oto Vozár (part time)

#### **External Lecturers**

Michal Laclavík, PhD.  
Martin Marko  
Jozef Papula, Professor  
Petr Šaloun, Assoc. Professor  
Danica Šoltésová, PhD.

#### **Full time PhD Students**

Anton Andrejko  
Michal Barla  
Peter Bartalos  
Jozef Hamar  
Ivan Kišac  
Matej Košík  
Ľubomír Majtás  
Ján Máté  
Jakub Mažgut  
Pavol Mederly  
Ján Suchal  
Martin Šechný  
Marián Šimko  
Jozef Tvarožek  
Michal Tvarožek

Peter Vojtek  
Marek Závodský

## 9.2 Teaching

### Undergraduate Study (Bc.)

Course	Semester	Credits	Lecturer
Artificial Intelligence	Spring	6	P. Návrat
Communication in Culture History	Spring	3	D. Šoltésová
Construction of Effective Algorithms	Spring	6	R. Královič
Data Structures and Algorithms	Autumn	6	P. Návrat
Entrepreneurship and Management	Autumn	5	J. Papula
Final Bachelor Project I-II	Autumn Spring	3-9	P. Návrat
Functional and Logic Programming	Spring	6	M. Bieliková
Information and Communication Technologies Law	Spring	5	D. Gregušová
Managerial Economics	Autumn	5	V. Mlynarovič
Object-Oriented Programming	Spring	6	V. Vranič
Program Development for Java Platform	Spring	6	M. Marko
Programming Languages and Compilation	Autumn	6	Ľ. Molnár
Principles of Information Systems	Autumn	5	V. Rozinajová
Principles of Software Engineering	Spring	7	M. Bieliková
Procedural Programming	Autumn	6	A. Bou Ezzeddine
Software Systems Development	Spring	3	M. Bieliková
Specifications Methods and Tools	Spring	5	Ľ. Molnár
Social Connotations of Informatics and Information and Communication Technologies	Spring	3	M. Winczer
Theoretical Foundations of Informatics	Spring	6	D. Chudá
Web Publishing	Spring	6	P. Šaloun

### Master Study (Ing.)

Course	Semester	Credits	Lecturer
Architecture of Information Systems	Autumn	4	M. Mlynarovič
Architecture of Software Systems	Autumn	4	P. Návrat
Architecture and Design Patterns for Program Information Systems	Spring	5	Ľ. Šešera
Aspect-Oriented Software Development	Autumn	5	V. Vranič
Design of Compilers	Autumn	6	Ľ. Molnár

Course	Semester	Credits	Lecturer
Diploma Project I–III (Information Systems)	Autumn Spring	4-10-21	P. Návrat
Diploma Project I–III (Software Engineering)	Autumn Spring	4-10-21	M. Bieliková
Distributed Operating Systems	Autumn	5	T. Seidmann
History of Design	Autumn	5	D. Šoltésová
Industry Project	Spring	5	M. Bieliková
Information Search	Autumn	5	M. Laclavík
Knowledge Discovery	Autumn	5	G. Kosková
Knowledge-Based Systems	Autumn	5	I. Kapustík
Law – Selected Problems	Spring	5	D. Gregušová
Management in Software Engineering	Spring	6	M. Bieliková
Object-Oriented Analysis and Design	Autumn	5	I. Polášek
Quality of Program and Information Systems	Spring	4	D. Chudá
Research of Information Systems	Autumn	1	P. Návrat
Research of Software Systems	Autumn	1	M. Bieliková
Team Information System Development I-II	Autumn Spring	6-6	M. Bieliková
Team Software System Development I-II	Autumn Spring	6-6	M. Bieliková

### 9.3 Theses

#### Bachelor (Bc.) Theses

- Baloga, Jakub: *Nonograms support*. May 2008. Supervisor: E. Hanulová
- Baranček, Karol: *Academic forum for subject*. May 2008. Supervisor: E. Hanulová
- Bartošek, Martin: *Protection of personal data in information systems*. May 2008. Supervisor: P. Návrat
- Bača, Pavol: *Verifying efficiency of minimal cut algorithms*. May 2008. Supervisor: M. Lekavý
- Belluš, Juraj: *Computer game*. May 2008. Supervisor: A. Považanová
- Benický, Peter: *Study forum*. May 2008. Supervisor: A. Hanulová
- Blažek, Slavomír: *Portals for managing simple projects*. May 2008. Supervisor: I. Kapustík
- Breier, Jakub: *Catalog of changes realized by aspect-oriented programming*. May 2008. Supervisor: V. Vranić
- Bábíček, Robin: *Form specific information ontology editor*. May 2008. Supervisor: P. Bartalos
- Chvostaľ, František: *Simulator of computing machines*. May 2008. Supervisor: I. Polický

- Cibulka, Miloš: *Trade simulation using mobile agents*. May 2008.  
Supervisor: I. Kapustík
- Csóka, Peter: *A tool for getting information from the internet*. May 2008.  
Supervisor: V. Rozinajová
- Čaučík, Martin: *Protecting of e-learning materials by digital watermark*.  
May 2008. Supervisor: D. Chudá
- Dankovčík, Tomáš: *Automated tools for life cycle support of information systems  
development*. May 2008. Supervisor: V. Rozinajová
- Drahoš, Michal: *Graphic editor*. May 2008. Supervisor: A. Považanová
- Ďaďo, Juraj: *Learning system for section of information systems*. May 2008.  
Supervisor: V. Rozinajová
- Folk, Michal: *Cluster designs on computers with OS Linux*. May 2008.  
Supervisor: M. Šechný
- Ganz, Viliam: *String comparison based on information content*. May 2008.  
Supervisor: A. Andrejko
- Grexa, Jozef: *A learning system for the information system domain*. May 2008.  
Supervisor: V. Rozinajová
- Halama, Radoslav: *Automated web page classification*. May 2008.  
Supervisor: P. Vojtek
- Haluška, Michal: *Simulator of computer models*. May 2008. Supervisor: I. Polický
- Herbst, Roman: *The system for student works submission*. May 2008.  
Supervisor: J. Mažgut
- Hečko, Michal: *Primitive devices drivers in Pict language*. May 2008.  
Supervisor: M. Košík
- Hlaváč, Michal: *Preprocessing of web pages*. May 2008. Supervisor: P. Vojtek
- Holic, Peter: *Defender behaviour*. May 2008. Supervisor: I. Kapustík
- Holub, Michal: *Graphical design of workflows*. May 2008. Supervisor: I. Polášek
- Hönsch, Marián: *Software design in international contest*. May 2008.  
Supervisor: M. Bielíková
- Jakubec, Peter: *System how to hand over the student works*. May 2008.  
Supervisor: J. Mažgut
- Kacina, Michal: *Internet as basic medium of electronic communication*. May 2008.  
Supervisor: P. Návrat
- Kompan, Michal: *Software design in international competition*. May 2008.  
Supervisor: M. Bielíková
- Košťial, Jaroslav: *The creation of intelligent module for knowledge management*.  
May 2008. Supervisor: I. Polášek
- Kramár, Tomáš: *Mining Web usage patterns*. May 2008. Supervisor: M. Barla
- Krcho, Martin: *Drawing UML diagrams by hand or using a tablet*. May 2008.  
Supervisor: I. Polášek

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- Kuliha, Branislav: *Visualization of theoretical computational models*. May 2008. Supervisor: D. Chudá
  - Kutenicsová, Dana: *Griddlers support*. May 2008. Supervisor: Ľ. Hanulová
  - Kučečka, Tomáš: *Simulated robotic football - analyses of player behaviour*. May 2008. Supervisor: M. Lekavý
  - Ligocký, Juraj: *Guide SWING in examples*. May 2008. Supervisor: A. Považanová
  - Lukáč, Vladimír: *Simulator of abstract computer RASP*. May 2008. Supervisor: I. Polický
  - Pavlovčín, Jozef: *Simulated robotics soccer – low level skills*. May 2008. Supervisor: M. Lekavý
  - Pašmík, Martin: *Visualization of theoretic computational models*. May 2008. Supervisor: D. Chudá
  - Perháč, Ján: *Software generation techniques*. May 2008. Supervisor: R. Filkorn
  - Polák, Marek: *Perspectives of full-text searching integrated in information systems of memory institutions*. May 2008. Supervisor: N. Andrejčíková
  - Poláková, Katarína: *Aggregate searching of entities by similar properties in heterogeneous source of information*. May 2008. Supervisor: J. Hamar
  - Putz, Jozef: *Drawing large graphs via a client-server interface*. May 2008. Supervisor: G. Frivolt
  - Pán, Gabriel: *Aggregated search of entities having similar characteristics in heterogeneous sources of information*. May 2008. Supervisor: J. Hamar
  - Repaský, Miroslav: *Random access stored program machine simulator*. May 2008. Supervisor: I. Polický
  - Rodina, Dušan: *Simulators of computational models - Turing Machine, RAM*. May 2008. Supervisor: D. Chudá
  - Rončkevič, Martin: *Development by model driven architecture*. May 2008. Supervisor: Ľ. Majtás
  - Ruttkay-Nedecký, Ivan: *Computer game*. May 2008. Supervisor: A. Považanová
  - Smolinský, Peter: *Use of supporting tools in process of information systems development lifecycle*. May 2008. Supervisor: V. Rozinajová
  - Szalayová, Lucia: *Academic course forum*. May 2008. Supervisor: Ľ. Hanulová
  - Šelmeci, Roman: *Application development by combining aspect-oriented design patterns*. May 2008. Supervisor: V. Vranič
  - Ševce, Ondrej: *Development based on Model driven architecture*. May 2008. Supervisor: Ľ. Majtás
  - Šimko, Jakub: *Software design in international competition*. May 2008. Supervisor: M. Bieliková
  - Štroffek, Michal: *Certification authority*. May 2008. Supervisor: J. Dobias
  - Valašík, Martin: *Clustering of users based on their behaviour*. May 2008. Supervisor: M. Barla

- Valo, Jozef: *Drivers of simple devices in Pict language*. May 2008.  
Supervisor: M. Košík
- Vanderka, Peter: *Techniques of software portions generation*. May 2008.  
Supervisor: R. Filkorn
- Vanek, Filip: *Swing guide in examples*. May 2008. Supervisor: A. Považanová
- Villaris, Vojtech: *Data mining by association rules*. May 2008.  
Supervisor: A. Bou Ezzeddine
- Zagora, Martin: *Adaptive web for virtual university*. May 2008.  
Supervisor: V. Šimáková
- Zahoranský, Dušan: *Graphics design of workflow processes*. May 2008.  
Supervisor: I. Polášek
- Zeleník, Dušan: *Software design in international competition*. May 2008.  
Supervisor: M. Bielíková

#### Master Theses

- Bartal, Michal: *Electronic commerce management*. May 2008.  
Supervisor: J. Minárová
- Blaho, Mário: *Digital library of reusable e-learning objects*. May 2008.  
Supervisor: D. Chudá
- Cichý, Martin: *Design patterns mining in the models of reverse engineering*.  
May 2008. Supervisor: J. Jakubík
- Dobiš, Michal: *Mining design patterns from existing projects*. May 2008.  
Supervisor: Ľ. Majtás
- Ďurfina, Michal: *Multifactor Authentication*. May 2008. Supervisor: D. Chudá
- Frlička, Andrej: *Recognition of digital curves*. May 2008.  
Supervisor: A. Považanová
- Fáber, Rudolf: *Support of model based software development*. May 2008.  
Supervisor: Ľ. Majtás
- Ivanka, Peter: *Structured documents creation support*. May 2008.  
Supervisor: A. Považanová
- Jackovič, Miroslav: *Simulated robotic soccer - team cooperation*. May 2008.  
Supervisor: M. Lekavý
- Janičkovič, Peter: *Analysis and validation of digital video streams*. May 2008.  
Supervisor: A. Považanová
- Kallo, Miroslav: *Powerboxed video card driver*. May 2008. Supervisor: M. Košík
- Kováčik, Martin: *Document comparison and similarity estimation using  
background knowledge*. May 2008. Supervisor: G. Frivolt
- Krausko, Ján: *Case study of IT service management implementation*. May 2008.  
Supervisor: M. Pecho
- Kurták, Michal: *Pattern recognition and refactoring*. May 2008.  
Supervisor: R. Filkorn



- Legéň, Miroslav: *Framework for learning patterns from documents*. December 2008. Supervisor: G. Frivolt
- Nociar, Peter: *Simulated robotic football – automatic learning*. May 2008. Supervisor: M. Lekavý
- Nágl, Martin: *Catalog of software knowledge with variability modelling*. May 2008. Supervisor: R. Filkorn
- Pazdera, Luboš: *Support of mobile agents creation*. May 2008. Supervisor: I. Kapustík
- Pažin, Jozef: *Theses in electronic form – collection and intermediation of data in academic environment*. May 2008. Supervisor: N. Andrejčíková
- Perďoch, Ján: *Presentation of history of informatics on STU*. December 2008. Supervisor: V. Šimáková
- Pok, Ondrej: *Hierarchical clustering of networks*. May 2008. Supervisor: G. Frivolt
- Rado, Ladislav: *Sharing information in a portal based on the Semantic Web*. December 2008. Supervisor: M. Bieliková
- Salaj, Marian: *Structured player for RoboCup simulated games*. May 2008. Supervisor: I. Kapustík
- Samiec, Michal: *Phonetic person searching*. May 2008. Supervisor: I. Polášek
- Schwartz, Richard: *Software quality assurance during particular development phases*. May 2008. Supervisor: M. Majerník
- Somogyi, Tibor: *Librarian support of e-learning*. May 2008. Supervisor: V. Šimáková
- Šarmír, Ján: *Extended possibilities of navigation in database of scientific publications based on cluster algorithms*. May 2008. Supervisor: I. Polický
- Šimko, Marián: *Relationships discovery in educational course content*. May 2008. Supervisor: M. Bieliková
- Tomša, Marek: *Adaptive navigation support in open spaces*. May 2008. Supervisor: M. Bieliková
- Veselý, Richard: *Ontology representation and querying using relational model*. May 2008. Supervisor: M. Bieliková
- Vozár, Oto: *Web learning system adaptation based on continuous assessment*. May 2008. Supervisor: M. Bieliková

## 9.4 Research Laboratories

### Intelligent Systems Laboratory

*Manager:* P. Návrat

*Contact:* pavol.navrat@stuba.sk

*Description:* The laboratory is used for research of a wide spectrum of problems that fall into the field of program and information systems mainly in the scope of artificial intelligence. The projects solved are concerned with the methods of knowledge system development with a special fo-

cus on multi-agent systems and their collaboration, as well as intelligent search, delivery, and presentation of heterogeneous information in a distributed environment such as Internet, including categorisation and recommendation of the information. The laboratory is equipped with fairly powerful computer systems and advanced software tools that correspond to the demands of the projects being solved. The equipment is regularly renewed thanks mainly to continuous success in grants including international ones.

### **Advanced Software and Web Technologies Laboratory**

*Manager:* M. Bieliková  
*Contact:* maria.bielikova@stuba.sk  
*Description:* The laboratory is used for research of a wide spectrum of problems that fall into the field of program and information systems mainly in the scope of software engineering. The projects being solved were concerned with the methods and tools of software system development with a special focus on the structure design of component-based and structure and presentation design of hypermedia systems. The laboratory is used also for research projects in the field of advanced software technologies for master degree students. The laboratory is equipped with fairly powerful computer systems and advanced CASE tools. The equipment is regularly renewed thanks mainly to continuous success in grants including international ones.

## **9.5 Research Projects**

### **Modelling and Acquisition, Processing and Employing Knowledge about User Activities in the Internet Hyperspace (APVT-20-007104)**

*Project leader:* M. Bieliková  
*Members:* A. Andrejko, M. Barla, P. Bartalos, I. Kapustík, Ľ. Molnár, P. Návrát, V. Rozinajová, J. Suchal, M. Tomša, M. Tvarožek, R. Veselý, P. Vojtek, O. Vozár, V. Vranić  
*Supported by:* Slovak Research and Development Agency  
*Duration:* January 2005 – April 2008  
*Description:* The project solves the current problem area of improving efficiency of the information providing and processing in the Internet. The primary approach used in this project comes from the idea to consider specific properties, habits and needs of the Internet web service user. By creating a suitably defined and represented user model, a space will be opened for design of methods which will enable a user to better (faster, more accurately, etc.) access desired information. Inputs for user model creation are at one side a track of his individual activities in the Internet space (behavioural patterns, typical navigational destinations and sequences, etc.), while on the other side they are results of his social behaviour in the user community with similar interests (mutual recommendations, etc.). The model defined this way may be derived for an individual user from his previous activities in the Internet space.

**Semantic Composition of Web and Grid Services (APVV-0391-06)**

- Project leader:* V. Rozinajová  
*Contractor:* Institute of Informatics, Slovak Academy of Sciences  
*Partners:* UI SAV Bratislava, Microstep Ltd., FEI TU Košice  
*Members:* P. Bartalos, M. Bieliková, I. Kapustík, P. Mederly, P. Návrat  
*Supported by:* Slovak Research and Development Agency  
*Duration:* February 2007 – December 2009  
*Description:* In recent years many distributed applications have moved towards loosely coupled sets of web and grid services. These services are part of a complex environment, which enables creation of many new applications. However, it also requires an extensive amount of knowledge and information in order to be effectively controlled. This project proposes the creation of an intelligent middleware layer, comprising of tools enabling such control. These tools will monitor the environment, will analyze captured information, and extract new knowledge from it. The new knowledge will be used in later application composition. Applications will be modelled as service workflows. The whole system will be integrated and accessible by an easy-to-use web portal.

**Models of software systems in the semantic web environment (VEGA, 1/3102/06)**

- Project leader:* P. Návrat  
*Members:* M. Bieliková, A. Bou Ezzeddine, D. Chudá, T. Chvostek, I. Kapustík, G. Kosková, I. Polášek, I. Polický, V. Rozinajová, V. Vranič, A. Andrejko, M. Barla, P. Bartalos, M. Košík, M. Lekavý, J. Mažgut, J. Suchal, P. Vojtek, J. Tvarožek, M. Tvarožek  
*Supported by:* Scientific Grant Agency of the Ministry of Education of Slovak Republic and the Slovak Academy of Sciences  
*Duration:* January 2006 – December 2008  
*Description:* Project focuses on research in the area of models and patterns application, namely in architectonic, analytical and compositional patterns. These models are used in software systems development. Their primary goal is intelligent providing, analysis, and presentation of information in distributed environment of the semantic web in particular. Intelligent processing of information in distributed and heterogeneous environment of the Internet needs the adaptation in open information environment. To do so, methods for knowledge, adaptation and navigation modelling are needed. As an essential part of web-based software systems development, project includes also modelling of distributed and varying sources of data and information. In this sense, it is appropriate to use statistic models for knowledge discovery of hidden patterns in the data and their application for ontology generation and searching for patterns in new ontologies design and descriptions of semantics in general.

**Tools for acquisition, processing and employing knowledge about user activities in the Internet hyperspace (1025/2004)**

- Project leader:* P. Návrat for STU  
*Partners:* UPJŠ Košice, UI SAV Bratislava, Softec Ltd. Bratislava

- Members:* A. Andrejko, M. Barla, P. Bartalos, M. Bieliková, R. Filkorn, G. Frivolt, I. Kapustík, G. Kosková, M. Lekavý, Ľ. Majtás, Ľ. Molnár, V. Rozinajová, J. Suchal, M. Tomša, M. Tvarožek, R. Veselý, P. Vojtek, O. Vozár, V. Vranič
- Supported by:* State programme of research and development “Establishing of Information Society”
- Duration:* September 2004 – May 2008
- Description:* The main outcome of the project is the design and experimental realization of the tools for information and knowledge processing within the domain of job offers. The tools operate with data that can be seen in the sequence from primary data on the Internet, or given by user, through acquired documents, the documents containing relevant data with respect for application domain (which are, in our case, job offers), in direction towards the offers chosen from documents with job opportunity offers, up to effective presentation of the offers to user.

#### **Adaptive web-based portal for learning programming (KEGA, 3/5187/07)**

- Project leader:* M. Bieliková
- Members:* A. Andrejko, M. Barla, A. Bou Ezzeddine, D. Chudá, I. Kapustník, J. Minárová, P. Návrat, I. Polášek, A. Považanová, J. Suchal, J. Tvarožek, M. Tvarožek, V. Vranič
- Supported by:* Cultural and Educational Grand Agency of the Ministry of Education of Slovak Republic
- Duration:* January 2005 – December 2009
- Description:* The essence of the project is the development of the methods and techniques to support adaptation in e-learning systems using the latest semantic web technologies. Adapting to user (personalization) requires mechanisms capable of working with semantics and discovering connections based on user behaviour during learning. The goal is to design and verify methods and techniques of knowledge presentation in an e-learning system based on ontology content representation.

#### **Teacher Induction: Supporting the Supporters of Novice Teachers in Europe (Comenius, 128825-CP-1-2006-UK-Comenius-C21-TISSNTE)**

- Project leader:* V. Rozinajová for STU
- Contractor:* Joan Stephenson, Liverpool John Moores University, United Kingdom
- Supported by:* Socrates programme of the European Commission,
- Countries:* United Kingdom, Belgium, Greece, Ireland, Austria, Portugal, Bulgaria, Latvia, Lithuania, Hungary, Malta
- Duration:* October 2006 – September 2009
- Description:* The European Commission has developed a common European Framework for teacher competences and qualifications, however, there is no common focus on the specific needs of new entrants to the profession or the concomitant needs of those who will induct and support them in schools. This project addresses: the role of supporters; identify and analyse what currently takes place; devise instruments to identify the needs of mentors/supporters; facilitate cross European debate about “good practice”; formulate a portfolio of support strategies for those involved in supporting novice teachers; stimulate exchange

between teachers and teacher educators; add to the European policy debate on the induction and support of novice teachers; provide training and support for those involved with novice teachers in schools and beyond.

**Theoretic and conceptual views of implementation of new functions into architectural heritage structure and their optimization with tourism as an example (VEGA 1/3300/06)**

*Project leader:* Faculty of Architecture, STU (for FIIT: P. Návrat)  
*Members:* I. Kapustík, P. Návrat  
*Supported by:* Scientific Grant Agency of the Ministry of Education of Slovak Republic and the Slovak Academy of Sciences  
*Duration:* January 2006 – December 2008  
*Description:* This project handles principally new model, which implements new functions into existing architectural heritage structure. Exploitation of cultural heritage (including architectural) for actual functions of present society is one of principal requirements modern monuments preservation formulated on international level. Concurrently, there must be fulfilled requirement that cultural heritage values are preserved. While monument preservation theory expects this relation works automatically, reality is different: process of new function implementation is intuitive, random, not respecting objective correlation associations. Model example of new function is tourism. Project initiates activation of unused capacity of mutually supporting correlation associations to reach bilaterally satisfied collaboration. Model respects partial features of different architectural heritage types in different environment.

**European Thematic Network for Teaching, Research and Innovations in Computing Education (ETN-142399-LLP-1-2008-1-BG-ERASMUS-ENW)**

*Project leader:* P. Návrat for STU  
*Contractor:* Angel Sotirov Smrikarov, Angel Kanchev University of Ruse, Bulgaria  
*Supported by:* Lifelong Learning Program  
*Countries:* Bulgaria  
*Duration:* October 2008 – September 2011  
*Description:* The project has several innovative aspects. One of them is the fact that it suggests reorganising the teaching process, through the use of modern technologies such as e-Learning, m-Learning, and development of new updated educational programs which will lead to higher quality education. Another innovative aspect is the fact that the education in Computing opens to science and business on one hand and on the other hand they open to it. Teaching, research and innovations are treated as inseparable components in Computing education and training. The project will contribute to the integration of the European Higher Education Area and that of the European Research and Innovation Area in the field of Computing education.

## 9.6 Publications

### Journals

- ANDREJKO, A., BIELIKOVÁ, M.: Investigating Similarity of Ontology Instances and Its Causes. In: *Lecture Notes in Computer Science*. Vol. 5164, ICANN 2008 – Artificial Neural Networks, ISSN 0302-9743. Artificial Neural Networks, Springer Berlin/Heidelberg 2008. pp. 1-10.
- BIELIKOVÁ, M., DIVÉKY, M., JURNEČKA, P., KAJAN, R., OMELINA, L.: Learning with Smart Multipurpose Interactive Learning Environment. In: *IFIP Series*. Vol. 281, Learning to Live in the Knowledge Society, ISSN 1571-5736. World Computer Congress, Springer Science+Business Media, LLC 2008. pp. 101-104.
- BIELIKOVÁ, M., DIVÉKY, M., JURNEČKA, P., KAJAN, R., OMELINA, L.: Automatic Generation of Adaptive, Educational and Multimedia Computer Games. In: *Signal, Image and Video Processing*. Vol. 2, No. 4. Springer London 2008. ISSN 1863-1711, pp. 371-384.
- BIELIKOVÁ, M., MORAVČÍK, M.: Modeling the Reusable Content of Adaptive Web-Based Applications Using an Ontology. In: *Studies in Computational Intelligence*. Vol. 93, Advances in Semantic Media Adaptation and Personalization. Springer-Verlag Berlin Heidelberg 2008. ISSN 1860-949X, pp. 307-327.
- FRIVOLT, G., SUCHAL, J., VESELÝ, R., VOJTEK, P., VOZÁR, O., BIELIKOVÁ, M.: Creation, Population and Preprocessing of Experimental Data Sets for Evaluation of Applications for the Semantic Web. In: *Lecture Notes in Computer Science*. SOFSEM 2008: Theory and Practice of Computer Science, Vol. 4910, ISSN 0302-9743. Slovakia, Springer-Verlag Berlin Heidelberg 2008. pp. 684-695.
- KOŠÍK, M.: Taming of Pict. In: *Lecture Notes in Computer Science*. Vol. 4910, SOFSEM 2008: Theory and Practice of Computer Science, ISSN 0302-9743. Springer-Verlag Berlin Heidelberg 2008. pp. 610-621.
- LEKAVÝ, M., NÁVRAT, P.: Extension of Rescheduling Based on Minimal Graph Cut. In: *Lecture Notes in Computer Science*. Vol. 4910. SOFSEM 2008: Theory and Practice of Computer Science, ISSN 0302-9743. Springer-Verlag Berlin Heidelberg 2008. pp. 340-351.
- NÁVRAT, P., KOVÁČIK, M., BOU EZZEDINNE, A., ROZINAJOVÁ, V.: Web Search Engine Working as a Bee Hive. In: *Web Intelligence and Agent Systems*, An International Journal. Vol.6. IOS Press 2008. ISSN 1570-1263, pp. 441-452.
- NÁVRAT, P., TARABA, T., BOU EZZEDDINE, A., CHUDÁ, D.: Context Search Enhanced by Readability Index. In: *IFIP Series*. Vol. 276, Artificial Intelligence in Theory and Practice II. World Computer Congress, Springer Science+Business Media, LLC 2008. pp. 373-382.
- ROZINAJOVÁ, V., BRAUN, M., NÁVRAT, P., BIELIKOVÁ, M.: Bridging the Gap between Service-oriented and Object-oriented Approach in Information Systems Development. In: *IFIP Series*. Vol. 274, Advances in Information Systems Research, Education and Practice. World Computer Congress, Springer Science+Business Media, LLC 2008. pp. 125-134.

- ŠIMÚN, M., ANDREJKO, A., BIELIKOVÁ, M.: Maintenance of Learner's Characteristics by Spreading a Change. In: *IFIP Series*. Vol. 281, Learning to live in the Knowledge Society. World Computer Congress, Springer Science+Business Media, LLC 2008. pp. 223-226.
- TVAROŽEK, J., KRAVČÍK, M., BIELIKOVÁ, M.: Towards Computerized Adaptive Assessment Based on Structured Tasks. In: *Lecture Notes in Computer Science*. Vol. 5149 Adaptive Hypermedia and Adaptive Web-Based Systems, ISSN 0302-9743. Springer-Verlag Berlin Heidelberg 2008. pp. 224-234.
- TVAROŽEK, M., BIELIKOVÁ, M.: Visualization of Personalized Faceted Browsing. In: *IFIP Series*. Vol. 272, Human Computer Interaction Symposium. World Computer Congress, Milano, Italy, New York, Springer Science+Business Media, LLC 2008. pp. 213-218.
- TVAROŽEK, M., BARLA, M., FRIVOLT, G., TOMŠA, M., BIELIKOVÁ, M.: Improving Semantic Search Via Integrated Personalized Faceted and Visual Graph Navigation. In: *Lecture Notes in Computer Science*. Vol. 4910. SOFSEM 2008: Theory and Practice of Computer Science, ISSN 0302-9743. Springer-Verlag Berlin Heidelberg 2008. pp. 778-789.

### International Conferences

- ANAGNOSTOPOULOS, I., BIELIKOVÁ, M., WALLACE, M., LEE, J.W.T: Intelligent Hypermedia for the Adaptive Web Foreword to the SMAP 2008 Special Session. In: *Semantic Media Adaptation and Personalization*, 3<sup>rd</sup> International Workshop, Prague, Los Alamitos IEEE Computer Society 2008. pp. 155-156.
- ANDREJKO, A., BIELIKOVÁ, M.: Personalized Comparing Instances of Domain Ontology Concepts. In: *Semantic Media Adaptation and Personalization*, 3<sup>rd</sup> International Workshop, Prague, Los Alamitos IEEE Computer Society 2008. pp. 76-81.
- BARTALOS, P., BIELIKOVÁ, M.: Enhancing Semantic Web Services Composition with User Interaction. In: *2008 IEEE International Conference on Services Computing*, Vol. 2, Honolulu, Hawaii, Los Alamitos, IEEE Computer Society 2008. pp. 503-506.
- BARTALOS, P., KAPUSTÍK, I., ROZINAJOVÁ, V.: Visual support of workflow composition involving collaboration. In: *GCCP 2008*, 4<sup>th</sup> International Workshop on Grid Computing for Complex Problems, Bratislava 2008. pp. 120-127.
- ČERŇANSKÝ, M., NEHÉZ, M., CHUDÁ, D., POLICKÝ, I.: On Using of Turing Machine Simulators in Teaching of Theoretical Computer Science. In: *Aplimat 2008*, 7<sup>th</sup> International Conference. Bratislava, 2008. pp. 917-927.
- CHVOSTEK, T., KOZÁK, Š.: Design of Communication Subsystem for the Hybrid Vehicles. In: *Cybernetics and Informatics*. International Conference. Ždiar, Slovak Republic, 2008. CD-ROM.
- CHVOSTEK, T., FOLTIN, M., KRÁTKY, A.: MATLAB Truetime Application in Network Control Systems. In: *Cybernetics and Informatics*. International Conference. Ždiar, Slovak Republic, 2008. CD-Rom.
- CICHÝ, M., JAKUBÍK, J.: Design Patterns Identification Using Similarity Scoring Algorithm with Weighting Score Extension. In: *Frontiers in Artificial Intelligence and*

- Applications*. Vol. 180, 8<sup>th</sup> Joint Conference on Knowledge-Based Software Engineering, Piraeus, Greece, Amsterdam IOS Press 2008. pp. 465-473.
- HABALA, O., PARALIČ, J., ROZINAJOVÁ, V., BARTALOS, P.: Data-aware Composition of Workflows of Web and Grid Services. In *Cracow Grid Workshop '08*, Kraków, Poster Presentations. 2008.
- LÍŠKA, M.: UML Model Validation with Axiomatic Knowledge Architecture in Context of Expert System for MDA. In: *International Workshop Control & Information Technology IWCIT'08*, Gliwice, Poland Gliwice Silesian University of Technology 2008. pp. 164-169.
- MAJTÁS, L., DOBIŠ, M.: Mining Design Patterns from Existing Projects using Static and Run-Time Dynamic Analysis. In: *CEE-SET 2008*, Preprint of the Proceedings of the 3<sup>rd</sup> IFIP Central and East Europe Conference on Software Engineering Techniques, Brno, Oficyna Wydawnicza Politechniki Wrocławskiej 2008. pp. 73-86.
- MAJTÁS, L.: Tool Based Support of the Pattern Instance Creation. In: *CEE-SET 2008*, Preprint of the Proceedings of the 3<sup>rd</sup> IFIP Central and East Europe Conference on Software Engineering Techniques, Brno, Oficyna Wydawnicza Politechniki Wrocławskiej 2008. pp. 147-156.
- MEDERLY, P., PÁLOS, G.: Enterprise Service Bus at Comenius University in Bratislava. In: *EUNIS 2008*, Visions for IT in Higher Education. Aarhus, Denmark, Aarhus, University of Aarhus 2008. pp. 11.
- TOMŠA, M., BIELIKOVÁ, M.: Hyperlinks Visualization Using Social Bookmarking. In: *Hypertext 2008*, Proceedings of the 19<sup>th</sup> ACM conference on Hypertext and hypermedia, Pittsburgh, PA, USA, New York, NY ACM Press 2008. pp. 245-246.
- TROCHANOVÁ, H., CHUDÁ, D.: Course E-Learning in LMS Moodle. In: *Virtual University 2008*, 9<sup>th</sup> International Conference. Bratislava, 2008. CD-ROM.
- TROCHANOVÁ, H., CHUDÁ, D.: Specify of making electronics. In: *Virtual University 2008*, 9<sup>th</sup> International Conference. Bratislava, 2008. CD-ROM.
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**Local and National Conferences**

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- CICHÝ, M., JAKUBÍK, J.: Design Patterns Identification Using Similarity Scoring Algorithm with Weighting Score Extension. In: *Student Research Conference 2008*. 4<sup>th</sup> Stu-

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- VOJTEK, P.: Moderated Iterative Multi-Relational Classification. In: *Student Research Conference 2008. 4<sup>th</sup> Student Research Conference in Informatics and Information Technologies Bratislava*, Supervisor: M. Bieliková, 2008. pp. 269-276.
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### Parts of Books

NÁVRAT, P., BIELIKOVÁ, M., CHUDÁ, D., ROZINAJOVÁ, V.: Information in semantically enriched space of world wide web. In: *Chapters on Knowledge Society*. Bratislava, Iura Edition, 2008. pp. 221-253. (in Slovak)

### Textbooks

VRANIČ, V.: Object-Oriented Programming: Objects, Java, and Aspects. STU Bratislava, 2008. ISBN 978-80-227-2830-0, 203 pp. (in Slovak)

### Reviews in Journals

BIELIKOVÁ, M. (rev.): Davies, J., Studer, R., Warren, P.: Semantic Web Technologies: Trends and Research in Ontology-based Systems. In: *Computing Reviews*. Vol. 49, No. 1 (2008). New York ACM Books and Journals, pp. 30.

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NÁVRAT, P. (rev.): Buschmann F., Henney, K., Schmidt, D.: Pattern-oriented Software Architecture: A Pattern Language for Distributed Computing. In: *Computing Reviews*. Vol. 49 (2008), on line.

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## 9.7 Cooperation

### Cooperation in Slovakia

- Institute of Informatics, Slovak Academy of Sciences, Bratislava
- Institute of Informatics, Faculty of Science, Pavol Jozef Šafárik University in Košice
- Faculty of Electrical Engineering and Information Technologies Technical University of Košice
- Faculty of Management Science and Informatics, University of Žilina
- Ditec Ltd.
- Datalan Ltd.
- Gratex International Ltd.
- Hewlett-Packard Slovakia Ltd.
- IBM Slovakia Ltd.
- Microsoft Slovakia Ltd.
- Oracle Slovakia Ltd.

- Siemens Ltd.
- Softec Ltd.
- Slovak Telecom

**International Cooperation**

- School of Information Sciences, University of Pittsburgh, Pittsburgh, USA
- Department of Computers, Faculty of Electrical Engineering, Czech Technical University in Prague, Czech Republic
- Institute of Information Systems, Faculty of Information Technologies, Brno University of Technology, Czech Republic
- Institute of Intelligent Systems, Faculty of Information Technologies, Brno University of Technology, Czech Republic
- Department of Computers, Faculty of Applied Science, University of West Bohemia in Pilsen, Czech Republic
- Department of Computer Science, Faculty of Electrical Engineering and Computer Science, Technical University of Ostrava, Czech Republic
- Faculty of Informatics, Masaryk University, Brno, Czech Republic
- Department of Software Engineering, Faculty of Mathematics and Physics, Charles University in Prague, Czech Republic
- UNESCO–Division of Information and Informatics, Paris, France
- University of Maribor, Slovenia
- Division of Computer Science, National Technical University of Athens, Greece
- Department of Information and Communication Systems Engineering, University of the Aegean, Greece
- University of Hannover, L3S Research Center, Hannover, Germany
- Institute of Computer Science, Faculty of Philosophy and Natural Sciences, Silesian University in Opava, Czech Republic
- Lancaster University, United Kingdom
- Faculty of Electrical and Electronic Engineering and Automation, University of Rousse, Bulgaria

**Visits of Staff Members**

- *V. Rozinajová*: TISSNTE project meeting, Pädagogische Akademie des Bundes Tyrol, Innsbruck, Austria, January 11-14, 2008
- *L. Molnár*: 2008 HP Technology for Teaching Worldwide Higher Education Conference, San Diego, USA, February 14-21, 2008
- *L. Molnár*: FIT VUT Brno, Czech Republic, March 26, 2008
- *L. Molnár*: UNESCO, Paris, France, April 1-9, 2008
- *M. Bieliková, P. Návrat, V. Rozinajová, M. Tvarožek*: World Wide Web Conference – WWW 2008, Beijing, April 18-24, 2008

- *P. Návrat*: CEEN workshop, Durres, Albania, May 22-25, 2008
- *M. Bieliková*: Technologies for e-learning – TPEV 2008, Praha, Czech Republic, May 29-31, 2008
- *L. Molnár*: UNESCO, Haag, The Netherlands, May 31 – June 2, 2008
- *P. Návrat*: FIT VUT Brno, Czech Republic, June 13, 2008
- *P. Návrat, V. Rozinajová*: FIT VUT Brno, Czech Republic, June 19, 2008
- *M. Bieliková*: Hypertext 2008, Pittsburgh, USA, June 14-24, 2008
- *M. Bieliková, D. Zeleník, J. Šimko, M. Hönsch, M. Kompan*: Imagine Cup Finals, Paris, France, July 2-8, 2008
- *L. Molnár*: UNESCO, Imagine Cup Finals, Paris, France, July 2-8, 2008
- *P. Bartalos*: Int. Conference on Services Computing – IEEE SCC 2008, Honolulu, Hawaii, July 6-15, 2008
- *M. Barla, M. Bieliková, J. Tvarožek*: Adaptive Hypermedia – AH 2008, Hannover, Germany, July 26 – August 2, 2008
- *J. Jakubík*: Joint Conf. on Knowledge Based Software Engineering – JCKBSE 2008, Piraeus, Greece, August 25-28, 2008
- *M. Bieliková*: Int. Conference on Artificial Neural Networks – ICANN 2008, Prague, Czech Republic, September 3-8, 2008
- *M. Bieliková, P. Návrat, V. Rozinajová, M. Tvarožek, M. Divéky, M. Braun*: World Computer Congress – WCC 2008, Milan, Italy, September 6-11, 2008
- *P. Vojtek*: European Conf. on Machine Learning and Principles and Practice of Knowledge Discovery in Databases – ECML PKDD 2008, Antwerp, Belgium, September 14-20, 2008
- *V. Vranić*: Lancaster University, United Kingdom, September 15-20, 2008
- *L. Majtás, V. Vranić*: Conference on Software Engineering Techniques – CEE-SET 2008, Brno, Czech Republic, October 13-15, 2008
- *L. Molnár*: UNESCO, Paris, France, October 15-18, 2008
- *V. Rozinajová*: TISSNTE Project Meeting, Budapest, Hungary, October 15-17, 2008
- *M. Bieliková*: Datakon 2008, Brno, Czech Republic, October 18-21, 2008
- *M. Košík, J. Máté*: Mathematical and Engineering Methods in Computer Science – MEMICS 2008, Znojmo, Czech Republic, November 14-16, 2008
- *M. Bieliková, J. Šimko, M. Kompan, D. Zeleník*: ACM CZ Student Research Competition 2008, Prague, Czech Republic, November 28-29, 2008
- *J. Tvarožek, J. Jánošík, M. Labaj, K. Rástočný, D. Švoňava, M. Lohnický, M. Šajgalík*: Contest is a Programming World Champions – ACM CEPC 2008, Wroclaw, Poland, November 28 – December 1, 2008
- *M. Bieliková*: Information Society Workshop, Svratka, Czech Republic, November 30 – December 1, 2008

- *M. Bieliková, A. Andrejko, O. Vozár*: Int. Workshop on Semantic Media Adaptation and Personalization – SMAP 2008, Prague, Czech Republic, December 15-16, 2008

#### Visits to the institute

- *P. Brusilovsky*, University of Pennsylvania, USA January 18-26, 2008
- *R. Kannan*, Bishop Heber College, India, April 13 – June 10, 2008

### 9.8 Membership in Professional Organisations and Societies

#### Slovak Professional Organisations and Societies

##### *Michal Barla*

- Slovak Society for Computer Science (member, since 2007)

##### *Peter Bartalos*

- Slovak Society for Computer Science (member, since 2007)

##### *Mária Bieliková*

- Slovak Artificial Intelligence Association (member, since 2000)
- Slovak Centre of the IET (member, since 1998)
- Slovak Society for Computer Science (member, since 1998; member of the executive committee, since 2000)

##### *Matej Košík*

- Slovak Society for Computer Science (member, since 2007)

##### *Marián Lekavý*

- Slovak Society for Computer Science (member, since 2007)

##### *Ludovít Molnár*

- Informatics Working Group of the Accreditation Commission of Slovakia (member, since 2003)
- Slovak Commission for UNESCO (member since 1993, chair, since 1996)
- Slovak Society for Computer Science (member, since 1992)
- Technical Standardization Committee (member, since 1992)

##### *Pavol Návrat*

- Accreditation Commission of Slovakia (vice-chair, since 1999; chair, 2002-2008)
- Informatics Working Group of the Accreditation Commission of Slovakia (member, since 1999)
- Slovak Artificial Intelligence Association (since 2000), member of the executive committee and vice chairman (since 2000)
- Slovak Association of Mathematicians and Physicists (member, since 1982)
- Slovak Centre of the IET (member, since 1996; chair, since 1997)
- Slovak Society for Computer Science (member, since 1992)



*Ján Suchal*

- Slovak Society for Computer Science (member, since 2007)

*Michal Tvarožek*

- Slovak Society for Computer Science (member, since 2007)

*Peter Vojtek*

- Slovak Society for Computer Science (member, since 2007)

*Valentino Vranič*

- Slovak Society for Computer Science (member, since 2001)

**International Professional Organisations and Societies***Mária Bielíková*

- IEEE, Institute of Electrical and Electronic Engineers (member, since 1998; senior member since 2003)
- IEEE Computer Society (member, since 1997)
- IET, Institution of Engineering and Technology (member, since 1998)
- ECUK, Engineering Council UK (registered Chartered Engineer, since 1998)
- ACM, Association for Computing Machinery (member, since 1998)
- IFIP, International Federation for Data Processing (member of Technical Committee TC2 – Software: Theory and Practice, since 2008)
- ISWE, International Society for Web Engineering (member, since 2007)
- CaSTB, Czech and Slovak Testing Board, a member of ISTQB, International Software Testing Qualifications Board (member, since 2006)
- SOFSEM – Annual Conference on Current Trends in Theory and Practice of Informatics Series, standing Steering Committee (member, since 2002)
- DATAKON – Annual Conference on the Current Trends in Databases and Information Systems Series, standing Steering Committee (member, since 2003)
- CEE-SET – Central and East European Conference on Software Engineering Techniques Series, standing Steering Committee (member, since 2007)

*Pavol Návrat*

- CEE Network, Central and Eastern European Network for Quality Assurance in Higher Education (chair, since 2006)
- AAAI, Association for the Advancement of Artificial Intelligence (member, since 1993)
- AACE, Association for Advancement of Computers in Education (member, since 1998)
- IEEE, Institute of Electrical and Electronic Engineers (member, since 1996; senior member, since 1998)
- IEEE Computer Society (member, since 1996)

- ACM, Association for Computing Machinery (member, since 1998)
- IFIP, International Federation for Data Processing (member of Technical Committee TC12 – Artificial Intelligence, since 1998)
- IET, Institution of Engineering and Technology (member since 1998; fellow, since 1998)
- ECUK, Engineering Council UK (registered Chartered Engineer, since 1998)
- JCKBSE, Joint Conference on Knowledge-Based Software Engineering Series, standing Steering Committee (member, since 1998)
- ADBIS, Advances in Databases and Information Systems Conference Series, standing Steering Committee (member, since 1998)
- Znalosti Conference Series, standing Steering Committee (member, since 2006)

#### *Eudovít Molnár*

- IEEE, Institute of Electrical and Electronic Engineers (member, since 1991)
- ACM, Association for Computing Machinery (member, since 1991)
- UNESCO (Slovak Commission: member of bureau –1993-96, chair – since 1996, Informatics section – chair since 1993. HQ Paris: IIP – member of bureau –1996-98, chair – 1998-2001, IFAP – member of bureau – since 2001. Executive Board – member – since 2001)

### **9.9 Other Activities**

- ACM International Collegiate Programming Contest 2008 – Slovak University of Technology Contest – I. Dekýšová: event organiser  
<http://www.fiit.stuba.sk/acm/>
- ACM CZ Student Research Competition 2008, Prague, Czech Republic – participation of 2 student projects (M. Bieliková: supervisor), finals, Prague, Czech republic (1<sup>st</sup> and 2<sup>nd</sup> place)
- RoboCup at FIIT 2008, Soccer Simulation League, Regional Tournament in Bratislava – I. Kapustík: event director, M. Lekavý: event organiser  
<http://www.fiit.stuba.sk/robocup/>
- Imagine Cup – 1<sup>st</sup> place in the regional student team contest, May 20, 2008, Bratislava, Slovakia (M. Bieliková, supervisor)
- Imagine Cup 2008 – 2<sup>nd</sup> place in the world cup, Paris, France (M. Bieliková, supervisor)
- IIT.SRC 2008 – Informatics and Information Technologies Student Research Conference, M. Bieliková: programme committee chair  
<http://www.fiit.stuba.sk/iit-src/>
- Computing and Informatics (CAI) – P. Návrat: associate editor and member of the editorial board
- International Journal of Intelligent Information and Database Systems – M. Bieliková: member of the editorial board
- ACM CZ Student Research Competition 2008 – M. Bieliková: member of steering committee

- VEGA, Scientific Grant Agency of the Ministry of Education of Slovak Republic and the Slovak Academy of Sciences – M. Bieliková, P. Návrat: members of technical committee
- Personalized Web (PeWe) Group seminar organization  
<http://www.fiit.stuba.sk/research/pewe>
- (Co)-organizing conferences WIKT 2008, TPEV 2008, Znalosti 2008
- DATAKON 2008 – Annual Conference on the Current Trends in Databases and Information Systems, October 18–21, 2008, Brno, Czech Republic – M. Bieliková: member of steering committee, member of programme committee
- ITAT 2008 – Conference on Information Intelligent Technologies – Applications and Theory. September 22–26, 2008. Poľana, Slovakia – M. Bieliková: member of programme committee
- SCO 2008 – 5<sup>th</sup> International Conference on Sharable Content Objects, June 4–5, 2008, Brno, Czech Republic – M. Bieliková: member of programme committee
- TPEV 2008 – Technologies for E-Learning, May 30, 2008, Prague, Czech Republic – M. Bieliková: member of programme and organising committee
- WIKT 2008 – 3<sup>rd</sup> Workshop on Intelligent and Knowledge oriented Technologies, November 6–7, Smolenice, Slovakia – M. Bieliková, P. Návrat, V. Rozinajová, V. Vranić: members of programme committee, V. Vranić: chair of organizing committee, M. Bieliková, D. Chudá, V. Rozinajová, J. Suchal: members of organizing committee
- ZNALOSTI 2008, February 13–15, 2008, Bratislava, Slovakia – M. Bieliková, P. Návrat: members of programme committee, P. Návrat: member of steering committee, P. Návrat, D. Chudá: co-chairs of organizing committee
- ADBIS 2008 – 12<sup>th</sup> East-European Conference on Advances in Databases and Information Systems, September 5-9, Pori, Finland, M. Bieliková: member of programme committee
- AMIF 2008 – Ambient Intelligence Forum 2008, October 15-16, Hradec Králové, Czech Republic, M. Bieliková: member programme committee
- CEE-SET 2008 – 2nd IFIP Central and East European Conference on Software Engineering Techniques, October 13-15, 2008, Brno, Czech Republic – M. Bieliková, member of steering and programme committee
- CompSysTech 2008 – International Conference on Computer Systems and Technologies 2008, June 12-13, Gabrovo, Bulgaria – P. Návrat: member of programme committee
- CSE 2008 – International Scientific Conference on Computer Science and Engineering, September 24-26, High Tatras, Slovakia, M. Bieliková, P. Návrat: members of programme committee
- ECDL 2008 – 12<sup>th</sup> European Conference on Research and Advanced Technology for Digital Libraries, September 14–19, 2008, Aarhus, Denmark – M. Bieliková: member of programme committee
- EJC 2008 – 18<sup>th</sup> European Japanese Conference on Information Modelling and Knowledge Bases, June 2-6, 2008, Tsukuba, Japan – M. Bieliková: member of programme committee

- ICWE 2008 – International Conference on Web Engineering, July 14-18, Yorktown Heights, New York, USA – M. Bieliková: member of programme committee
- ENASE 2008 – 3<sup>rd</sup> International Working Conference of Evaluation of Novel Approaches to Software Engineering, May 4-7, Funchal, Madeira, Portugal, M. Bieliková: member of programme committee
- GCCP 2008 – 4<sup>th</sup> International Workshop on Grid Computing for Complex Problems, October 27-29, 2008, Bratislava, Slovakia – Ľ. Molnár: member of programme committee
- ICDEM 2008 – International Conference on Data Engineering and Management, February 9, Bishop Heber College, Tiruchirappalli, India – M. Bieliková: member of programme committee
- ICETA 2008 – 6<sup>th</sup> International Conference on Emerging E-Learning Technologies and Applications, September 11-13 2008, Stará Lesná, High Tatras, Slovakia – Ľ. Molnár, P. Návrat, members of honorary committee, M. Bieliková: member of programme committee
- ISD 2008 – 17<sup>th</sup> International Conference on Information Systems Development, August 25-27, 2008, Paphos, Cyprus – M. Barla: member of programme committee
- KES 2008 – 12<sup>th</sup> International Conference on Knowledge-Based and Intelligent Information & Engineering Systems, September 3-5, Zagreb, Croatia, M. Bieliková: member of programme committee
- KES IIMSS 2008 – 2<sup>nd</sup> KES International Symposium on Agent and Multi-Agent Systems – Technologies and Applications, March 26-28, Inha University, Korea – M. Bieliková: member of programme committee
- MCCIS-ISA 2008 – IADIS International Conference, Intelligent Systems and Agents 2008 Conference, July 22-27, Netherlands, M. Bieliková: member of programme committee
- SEESE 2008 – Software Engineering in East and South Europe, ICSE 2008, May 13, Leipzig, Germany, M. Bieliková, P. Návrat: members of programme committee
- SERA 2008 – International Conference on Software Engineering Research, Management and Applications, August 20-22, Prague, Czech Republic, M. Bieliková: member of programme committee
- SOFSEM 2008 – International Conference on Current Trends in Theory and Practice of Informatics, January 19-25, Nový Smokovec, Slovakia – P. Návrat: Chair of Web Technologies, M. Bieliková: member of programme committee
- SMAP 2008 – 3<sup>rd</sup> International Workshop on Semantic Media Adaptation and Personalization, December 15-16, Prague, Czech Republic – M. Bieliková: local chair and member of programme committee
- SSKI 2008, International Conference on Cybernetics and Informatics, Belianske Tatras – Ľ. Molnár: members of programme committee
- WISR 2008 – Workshop on Web Information Systems Reengineering, in conjunction with 9<sup>th</sup> International Conference on Web Information Systems Engineering (WISE 2008), September 1-4, Auckland, New Zealand, M. Bieliková: member of programme committee

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## 10 Regional Networking Academy

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**E-mail:** [info@cisco.fiit.stuba.sk](mailto:info@cisco.fiit.stuba.sk)  
**Web:** [www.cisco.fiit.stuba.sk](http://www.cisco.fiit.stuba.sk)  
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**Fax:** + 421 2 654 20 587

Regional Networking Academy (RCNA FIIT STU) consists of three multipurpose research and pedagogical laboratory facilities designated for education in the field of computer networks at all three degrees of study programme Computer systems and Computer Networks and for education of subjects related to Computer Networking of the study programme Informatics.

Except filling study programs Regional Networking Academy provides complete courses and study programs in the field of computer networks as a part of Cisco Networking Academy Program - NetAcad. Throughout these courses students gain the necessary knowledge and practical skills to successfully pass Cisco Certified Networking Associate (CCNA) and Cisco Certified Networking Professional (CCNP) certification exams. These exams are well known and highly recognized by the industry. Education that is a part of the Academy offer complete spectrum of courses, starting with basic principles of how computer networks work and continuing with modern networking technologies such as IP Telephony and wireless communication based on IEEE 802.11 standards (WiFi). Laboratory facilities are equipped with modern communication technology including hardware routers, hardware switches, hardware firewalls, PCs with connection to the Internet and other necessary components for the purpose of practical education in the field of computer networks.

RCNA FIIT STU offers technological environment for research in the field of modern methods of communication in the computer networks. It creates quality conditions for solving research grants in the field of methods and resources for creating security and management of communication and mobile computer systems. Pedagogical process is greatly enhanced by providing the necessary support for practical learning during the education of subjects related to computer networking throughout all three degrees of study program Computer systems. Within the education process of RCNA prepares instructor training of 20 Local Cisco Networking Academies in the Slovakia and prepares students for CCNA and CCNP certification exams.

## 10.1 Staff

### Director

Pavel Čičák, Associate Professor, CCNA, CCAI

### Administrative Department

Marušincová Zuzana

### Instructor Staff

Boris Dado

Igor Grellneth, PhD., CCNA, CCAI

Štefan Gula, CCNA, CCNP

Katarína Jelemenská, PhD.

Margaréta Kotočová, Associate Professor, CCNA, CCAI

Dušan Malina

Peter Mesjar, CCNA, CCNP, CCAI, CCIE

Vladimír Michalec, CCNA, CCNP

Michal Vrábel

### Engineering Staff

Dušan Bernát

Roman Stoviček, PhD.

## 10.2 Projects

### Pilot project for education of selected modern IT topics in lifelong education process using modern teaching methods (JPD 3/2005/2.1/01-48, project code 131201110125)

*Project leader:* P. Čičák

*Members:* A. Bagala, D. Bernát, B. Dado, I. Grellneth, L. Hudec, K. Jelemenská, M. Kotočová, T. Krajčovič

*Supported by:* European Social Fund

*Duration:* August 2006 – July 2008

*Description:* The main goal of the project is the qualification enhancement of employees, unemployed, and self-employed persons in the selected area of IT. The following courses will be held: The Introduction into Information Systems Security (BIS1), Advanced Course of Information Security (BIS2), Network Technology Basics (ST1), Advanced Network Technologies (ST2), Embedded Systems Basics (VS), Digital Systems Design Methods (NMDS), Computer Basics (PG).

## 10.3 Study programs

- Study program for preparation for certification exam CCNA
- Study program for preparation for certification exam CCNP
- Study program for preparation for certification exam WLSS
- Study program for preparation for certification exam Cisco Firewall Specialist
- Study program for preparation of specialists in the field of IP Telephony

## **10.4 Cooperation**

### **Cooperation in Slovakia**

- Regional Cisco Networking Academy, Faculty of Electrical Engineering and Information Technology, Technical University in Košice
- Regional Cisco Networking Academy, Faculty of Management Science and Informatics, University of Žilina
- CISCO Systems Ltd.
- GTEC Ltd.
- Soitron Ltd.
- DITEC Ltd.
- Tempest
- Hewlett-Packard Slovakia Ltd.
- IBM Slovakia Ltd.
- Microsoft Slovakia Ltd.
- Siemens Ltd.

### **International Cooperation**

- Regional Cisco Networking Academy, Czech University of Technology, Prague, Czech Republic
- Regional Cisco Networking Academy, Faculty of Information Technologies, Technical University in Brno, Czech Republic
- Regional Cisco Networking Academy, Department of Computers, University of West Bohemia in Pilsen, Czech Republic
- Regional Cisco Networking Academy, Technical University in Ostrava, Czech Republic
- CATC Vienna, Austria
- CATC Birmingham, UK





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## 11 FIIT Personnel

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ANDREJČÍKOVÁ, Nadežda, Ing.	Institute of Informatics and Software Engineering
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