

**FACULTY OF INFORMATICS
AND INFORMATION TECHNOLOGIES**

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ANNUAL REPORT

2007

S T U . . SLOVENSKÁ TECHNICKÁ UNIVERZITA V BRATISLAVE
.
F I I T . Fakulta informatiky a informačných technológií
.

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Text Design & Composition: Mária Bieliková
Photo: Mária Bieliková, Peter Lacko, Vladimír Bafia

Cover Designer: Peter Kaminský

Published by:
Vydavateľstvo STU
Vazovova 5, Bratislava, Slovakia

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1 Message from the dean



The year 2007 is an important for a short history of the Faculty of Informatics and Information Technologies, Slovak University of Technology (FIIT STU) as the first term of the dean and the management of the Faculty expired and the election of new dean took place.

In 2003 when the Faculty was established, we elaborated the Long term strategy of the Faculty development. In it, we formulated a plan to prepare new study programs based on the latest results in the field of informatics and information technologies (IIT) and recommendations of such international institutes as UNESCO, ACM and IEEE Computer Society. We promised to implement the Bologna declaration not only in structuring of educational levels, but in inter-linking more closely education and research as well.

The evaluation of the Long term strategy for the year 2007 showed that almost all goals for this year have been successfully achieved. We are proud that there is 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 3rd 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.

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.

At the end of this short introduction let me inform the readers that the Academic Senate of the Faculty elected me as the dean of the FIIT STU for the next term and that the new vice-deans have been approved and appointed.

The new vice-deans for the next term are as follows:

Mária Bieliková, Professor
Vice-Dean for Research and Human Resources
vicedean_research@fiit.stuba.sk

Pavel Čičák, Assoc. Professor
Vice-Dean for National and International Relations and for Public Relations
vicedean_cooperation@fiit.stuba.sk

Margaréta Kotočová, Assoc. Professor
Vice-Dean for Education
vicedean_education@fiit.stuba.sk

Štefan Kozák, Professor
Vice-Dean for New Building and Material Resources
vicedean_development@fiit.stuba.sk



Prof. Ľudovít Molnár
Dean of the FIIT STU

2 Faculty Management Bodies

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 2007

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

Pavol Návrat, Professor
chair
chair@as.fiit.stuba.sk

Milan Kolesár, Professor
chair of the employee part

Ján Máté
chair of the student part

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

Mária Hricová

Members of the faculty part of the Academic Senate

staff@as.fiit.stuba.sk

Ladislav Hudec, Assoc. Professor
Igor Grellneth (till October 2007)
Daniela Chudá (since October 2007)
Katarína Jelemenská
Ivan Kapustík
Milan Kolesár, Professor
Vladimír Kvasnička, Professor
Pavol Návrát, Professor
Martin Šperka, Assoc. Professor

Members of the student part of the Academic Senate

students@as.fiit.stuba.sk

Ondrej Bellay (since April 2007)
Eva Danillová (since April 2007)
Michal Ďurfina
Martina Chabadová (till April 2007)
Ján Máté
Tomáš Minčeff (till February 2007)

Activities of the Academic Senate of the Faculty in 2007

The Academic Senate of the Faculty of Informatics and Information Technologies in 2007

- discussed the proposal of study programmes of the Faculty 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. New vice-deans were approved by the Academic Senate in January 2008, so we list here vice-deans who were in office for 2007.

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

Tibor Krajčovič, Assoc. Professor

Vice-Dean for Services and Development

vice dean_development@fiit.stuba.sk

2.3 Scientific Board of the Faculty

Members of the Scientific Board in 2007

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

Milan Kolesár, Professor

Margaréta Kotočová, Assoc. Professor

Tibor Krajčovič, Assoc. Professor

Vladimír Kvasnička, Professor

Ludovít Molnár, Professor

Pavol Návrat, Professor

Zdenka Riečanová, Professor

Martin Šperka, Assoc. Professor

Vladimír Vojtek, Professor

External members

Milan Češka, Professor – Brno University of Technology
Ladislav Hluchý, PhD. – Institute of Informatics, Slovak Academy of Sciences
Josef Kolář, Assoc. Professor – Czech Technical University in Prague
Milan Krokavec, Professor – Technical University of Košice
Karol Matiaško, Assoc. Professor – University of Žilina
Stojan Russev, Professor – University of Economics in Bratislava
Jiří Šafařík, Professor – University of West Bohemia in Pilsen

Activities of the Scientific Board of the Faculty in 2007

The Scientific Board of the Faculty of Informatics and Information Technologies in 2007

- discussed an update of the long-term strategy of the Faculty development for the 2007 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 2007/08 offered by the Faculty,
- discussed and approved the proposal of updating study programmes for complex accreditation of activities of the Slovak University of Technology,
- 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 supervisors for doctoral study programmes (in accordance with the University Code),
- approved the Dean's proposals for filling posts of "visiting associate professor" to:
 - Peter Tiňo (University of Birmingham, UK; with the Institute of Informatics and Software Engineering)
- conferred the academic degree „philosophie doctor“ to:
 - Michal Čerňanský (Applied Informatics)
 - Vladimír Voříšek (Applied Informatics)
 - Vladmír Siládi (Computer Hardware and Systems)
 - Hossam el-ddin Mostafa Husin (Computer Hardware and Systems)
 - Zoltán Balogh (Applied Informatics).

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 in 2007

Chair of the Disciplinary Commission of the Faculty

Ladislav Hudec, Assoc. Professor

Members of the Disciplinary Commission of the Faculty

Juraj Štefanovič, PhD.

Ivan Kapustík

Michal Zimen – student of the doctoral degree programme

Michal Ďurfina – student of the master degree programme

Lucia Szallayová – student of the bachelor degree programme

3 Study

3.1 Undergraduate Study (Bc)

In 2007 two accredited study programmes with regular length three years were offered:

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

Students in the “old” programme Informatics with regular length of four years progressed their study in two specialisations (study majors) – Software Engineering and Computer Engineering. This programme was accredited by the British Engineering Council following an accreditation process carried out by the Institution of Electrical Engineers (UK).

The Academic Accreditation Panel of the Institution of Engineering and Technology (former the Institution of Electrical Engineering) in its visit in February 2007 proposed to the Academic Accreditation Committee to award the the following accreditations: *Bc Informatics* and *Bc Computer Systems and Networks* study programmes were awarded five years accreditation from the 2004 intake to the 2008 intake in partial 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). In the academic year 2002/2003 the students of the Telecommunication specialisation (the specialisation at the FEI STU) were included in the numbers of students (except of the first year).

Numbers of the full-time bachelor programme students

	1 st year	2 nd year	3 rd year	4 th year ¹
Academic year 2002/2003 ³	120	127	198	145
2003/2004 ³	150	103	123	134
2004/2005	333	112	95 ³	156
2005/2006	344	262	91	92
2006/2007	332	269	246	19
2007/2008	290	272	266	1

On the course we have 3 overseas students.

¹ only the students in programme Informatics

In June 2007 the students in the “old” programme Informatics and the students in the both study programmes defended their bachelor theses and passed the final examination. The number of all graduates was 170 (16 in “old” programme, 104 in study programme Informatics and 50 in study programme Computer Systems and Networks).

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

- “*Magna cum laude*”: Miroslav Bartoš, Marko Divéky, Jakub Kožíšek, Dušan Kysel, Tomáš Labuda, Lenka Litvová, Juraj Michalák, Tomáš Mózes, Michal Poláčik, Alexander Šimko, Miroslav Štolc, Jakub Tekel’
- *Dean’s Award for Excellent Bachelor Thesis*: Marko Divéky, Juraj Michalák, Lenka Litvová
- *Dean’s Commendatory Letter for Bachelor Thesis*: Roman Červenák, Ivan Gál, Jozef Hopko, Peter Jurnečka, Rudolf Kajan, Peter Magula, Maroš Majerčík, Radoslav Menkyna, Tomáš Mózes, Ľuboš Omelina, Tomáš Polák, Igor Sečanský.

912 applicants took part in the entrance examination to bachelor study programmes on April 25-26, 2007. The written examination consisted of mathematics and informatics with orientation on algorithmic and logic thinking (24 tasks, 65 points max.). 447 applicants were offered admission (301 Informatics, 146 Computer Systems and Networks), 298 out of them actually made use of it and were enrolled (200 Informatics, 98 Computer Systems and Networks).

3.2 Master Study (Ing)

In the academic year 2006/2007, FIIT STU offered three accredited study programmes:

- *Software Engineering* – regular length two or three years²,
- *Computer Systems and Networks* (as an orientation in Computer Engineering) – regular length two or three years,
- *Information Systems* – regular length two or three years.

The Academic Accreditation Panel of the Institution of Engineering and Technology (former the Institution of Electrical Engineering) in its visit in February 2007 proposed to the Academic Accreditation Committee to award the the following accreditations:

- *Ing Software Engineering* and *Ing Computer Systems and Networks* study programmes were 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 was 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/>.

² three years for students who have not obtained their first degree in related field.

Numbers of the full-time master programme students

Academic year	2002/2003	167
	2003/2004	151
	2004/2005	182
	2005/2006	231
	2006/2007	290
	2007/2008	326

On the course we have 5 overseas students.

In these study programmes 42 students graduated in spring semester 2006/2007 and 52 students in autumn semester 2007/2008:

- 37 graduates in Software Engineering,
- 42 graduates in Computer Systems and Networks and
- 15 graduates in Information Systems.

The following students were conferred awards for their excellent results³:

- “*Summa cum laude*”: Viktor Tlacháč,
- “*Magna cum laude*”: Pavol Fülöp, Lucia Novická,
- “*Cum laude*”: Martin Adam, Imrich Balko, Ľuboš Heriban, Juraj Majer, Michal Šimún, Tomáš Tóth,
- *Dean’s Award for Excellent Master Thesis (proposal)*: Michal Šimún, Ľubomír Hanuliak,
- *Slovak Academy of Sciences Award for Excellent Master Thesis (proposal)*: Martin Adam, Tomáš Kuzár, Roland Dobai,
- *Tatra Bank Award for Excellent Master Thesis (proposal)*: Ľubomír Hanuliak, Tomáš Taraba,
- *Werner von Siemens Excellence Award*: Michal Tvarožek,
- *Dean’s Commendatory Letter for Master Thesis*: Martin Adam, Imrich Balko, Michal Habala, Peter Polačko, Ľubomír Hanuliak, Michal Bebjak, Roland Dobai, Matej Haulík, Michal Homola, Michal Kobza, Miroslav Kropáček, Tomáš Kuzár, Martin Kvasnička, Juraj Majer, Michal Šimún, Tomáš Taraba, Tomáš Tóth.

243 applicants took part in an entrance examination on July 2007 as a prerequisite to the master programmes. 184 students were offered admission (72 Software Engineering, 64 Computer Systems and Networks, 48 Information Systems), 171 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 posi-

³ Several awards are conferred once per academic year – the selection is made according to proposals.

tions 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	2000	2001	2002	2003	2004	2005	2006	2007
Number of students	14	10	11	16	22	22	24	25

In 2007 following dissertations were defended:

- *Michal Čerňanský: Comparison of Recurrent Neural Networks with Markov Models on Complex Symbolic Sequences* (supervisor: Ľubica Beňušková, Assoc. Professor)
- *Hossam el-ddin Mostafa Husin: New Communication Methods in Mobile Computer Networks* (supervisor: Pavel Čičák, Assoc. Professor)
- *Zoltán Balogh: Knowledge-based Approach to Performance Estimation of Services for Grid Workflows* (supervisor: Ladislav Hluchý, PhD.)
- *Vladimír Voříšek: An Advanced at Speed Scan Test Methodology for Digital Systems* (supervisor: Elena Gramatová, Assoc. Professor)
- *Vladimír Siládi: Parallel Hybrid Genetic Algorithm for optimization of irregular topologies of connecting networks* (supervisor: Ján Kolenička, Professor)

2007 was already the third year that the Faculty admitted students for study in newly accredited study programmes in doctoral study for the third time. Four 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),
- *Artificial Intelligence.*

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 2007 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:

ACM International Collegiate Programming Contest 2007

- Winners of Slovak University of Technology ACM Programming Contest, participation in Central European Regional Contest 2007, Prague, Czech Republic: Daniel Švoňava a Michal Lohnický

ACM CZ Student Research Competition 2007

- 1st place, Czecho-Slovak finals:
Oto Vozár, Andrej Frlička, Marek Tomša, Richard Veselý: Role-playing Game as an Adaptive Educational System, supervisor: M. Bieliková

ProFIIT 2007 – Programming Competition for Secondary School Students (P. Trebatický, contest director)

RoboCup 2007, Soccer Simulation League

- Winners of Slovak University of Technology RoboCup 2007:
Peter Kohaut, Martin Kováčik, Tomáš Selnekovič, Ladislav Lenčucha, Juraj Somorovský, Juraj Staník, supervisor: I. Kapustík

IIT.SRC 2007 – Informatics and Information Technologies Student Research Conference (to be mentioned in the following section in more detail)

Imagine Cup 2007

- 1st place Slovak finals, participation in World Finals, Seoul, Korea:
Marko Divéky, Rudolf Kajan, Peter Jurnečka, Ľuboš Omelina:
Smart Multipurpose Interactive Learning Environment, supervisor: M. Bieliková

IEEE Computer Society Web Programming Competition CHC61

- Taking part among 9 best student teams of the world:
Matej Jariabka, Ivana Krátka, Michal Kajaba: Norbert Frištacký – The Computer Pioneer, supervisor: M. Šperka

Cisco Olymp 2007

- Peter Magula, 3rd place in national competition

Europrix Multimedia Top Talent Awards 2007

- Top Talent Quality Seal:
Michal Dobiš, Vladimír Hlaváček, Linh Hoang Xuan, Michal Jajcaj, Dušan Lamoš: icPoint – Interactive night sky observation, supervisor: A. Kovárová

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

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

4 Research

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 2007, FIIT STU has organised or co-organised several scientific events:

- scientific conference *Cognition and Artificial Life VII*,
- scientific seminar *TPEV 2007 – Technologies for e-learning*,

- international congress *ITAPA 2007 – Congress on Information Technologies and Public Administration*,
- international scientific conference *SCCG 2007 – 23rd Spring Conference on Computer Graphics*,
- scientific conference *Znalosti 2007*,
- international scientific conference *SOFSEM 2007 – Annual Conference on Current Trends in Theory and Practice of Informatics*,
- scientific conference *ITAT 2007 – Theory and Practice of Information Technology*,
- scientific workshop *Tools for Acquisition, Organisation and Presenting of Information and Knowledge* held in conjunction with ITAT 2007,
- scientific workshop *WIKT 2007 – 2nd Workshop on Intelligent and Knowledge Oriented Technologies*,
- international scientific conference *ITI 2007 – 29th International Conference on Information Technology Interfaces*.

The Faculty took part in providing technical and scientific programmes, especially through the work in programme committees of about 30 conferences, mostly international:

- ADML, International Workshop on Applying Data Mining in e-Learning, EC-TEL International Conference,
- BIOCAMP, International Conference on Bioinformatics & Computational Biology,
- CEESE, 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,
- 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,
- ECI, International Conference on Electronic Computers and Informatics,
- EDM, International Workshop on Educational Data Mining, as part of the IEEE International Conference on Advanced Learning Technologies, ICALT,
- ETID, International Workshop on Evolutionary Techniques in Data Processing,
- GEM, International Conference on Genetic and Evolutionary Methods,
- IADIS, Virtual Multi Conference on Computer Science and Information Systems – Intelligent Systems and Agents,

-
- ICETA, International Conference on Emerging E-Learning Technologies and Applications,
 - ICWE, International Conference on Web Engineering,
 - IDC, International Symposium on Intelligent and Distributed Computing,
 - INFORMATICS, Conference on Computer Science and Informatics,
 - ISIM, International Conference on Information Systems Implementation and Modelling,
 - ITAT, Workshop on Information Technologies – Applications and Theory,
 - ITI, International Conference on Information Technology Interfaces,
 - KES-AMSTA, Symposium on Agent and Multi-Agent Systems – Technologies and Applications,
 - MENDEL, International Conference on Soft Computing,
 - RAAWS, International Workshop on Recommender Agents and Adaptive Web-based Systems,
 - SCCG, Spring Conference on Computer Graphics,
 - SCO, Sharable Content Objects,
 - SMAP, International Workshop on Semantic Media Adaptation and Personalization,
 - SOFSEM, Annual Conference on Current Trends in Theory and Practice of Informatics,
 - TPEV, Technologies for E-Learning Seminar,
 - ZNALOSTI, Annual Conference on Knowledge Acquisition, Representation and Exploitation,
 - VU, International Conference Virtual University,
 - WIKT, Workshop on Intelligent and Knowledge oriented Technologies,
 - WEBIST, International Conference on Web Information Systems.

In 2007, FIIT STU organised or co-organised several events oriented to exhibition of research work of students (accomplished in the student projects). Above all, it was the 3rd Informatics and Information Technologies Students Research Conference – IIT.SRC 2007 – which was held on April 18, 2007.

IIT.SRC 2007 attracted 53 student papers (10 bachelor, 24 master, 19 doctoral). It is an increase comparing to 2006 by 23% mostly in bachelor and master student categories. This fact supports our endeavour to attract more students of graduate and undergraduate study. Papers are in two categories: full papers and extended abstracts. Two extended abstracts have a special position as they present excellent work of two teams of students for international competition Imagine Cup 2007 – Software Design category.

IIT.SRC 2007 was organized in four sections:

- Artificial Intelligence and Computer Science, Multimedia and Computer Graphics

- Computer Networks, Security and Grids, Digital Systems
- Software Engineering and Multi-Agent Systems, Operating Systems
- Information Processing and Web Technologies

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

- category of doctoral students Michal Tvarožek (Adaptive Faceted Browser for Navigation in Open Information Spaces, supervisor M. Bieliková)
- category of master students Martin Kútny (Modelling User Behaviour Characteristics for Identification Using Keystroke Dynamics, supervisor V. Vojtek)
- category of bachelor students Radoslav Menkyna (Towards Combining Aspect-Oriented Design Patterns, supervisor V. Vranić)

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

- Michal Dobiš, Vladimír Hlaváček, Linh Xuan Hoang, Michal Jajcaj, Dušan Lamoš (icPoint: Interactive Night Sky Observation, supervisor A. Kovárová)
- Peter Bartalos (An Approach to Object-Ontology Mapping, supervisor M. Bieliková)
- Drahomír Osvald (Monitoring Unit for Digital Systems, supervisor T. Krajčovič)
- Ján Suchal (Caching Spreading Activation Search, supervisor P. Návrat)

Besides the 53 papers presented at the conference the RoboCup Exhibition was organised as a part of IIT.SRC 2007. Accompanying events included also programming competition and technical presentations related to modern information technologies given by the conference sponsors.

The finals of the 5th ACM CZ Student Research Competition were organised in November 2007 in Prague. Ten best bachelor and master student projects from 7 universities from the Czech Republic and Slovakia were presented. The project *Role-playing Game as an Adaptive Educational System* authored by our students Oto Vozár, Andrej Frlička, Marek Tomša, Richard Veselý (supervisor M. Bieliková) won the 1st 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 2007 master thesis elaborated by our student Michal Tvarožek was awarded.



4.3 Publications

Results of our research were published in 149 papers, which represents an increase in comparison with 2006. 117 scientific contributions were published in conference proceedings, 70 out of which were published in reviewed proceedings of international conferences. 22 scientific contributions were published in scientific journals and we have authors (co-authors -editors) of 4 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. Návrát and V. Kvasnička were members of its editorial board in 2007.

<i>Number of publications in 2007</i>	UAPI ⁴	UISI	UPSS	FIIT
Books and textbooks	2	1	1	4
Scientific works published in scientific journals listed in CC	3	1	1	4
Scientific works published in other international/national scientific journals	2/3	6/1	-/1	13
Scientific works published in international conference proceedings	11	32	3	46
Scientific works published in national or local conference proceedings	18	45	8	71
Conference proceedings editors	1	5	-	6
Published reviews	-	5	-	5

<i>Overview of other most significant activities in 2007</i>	UAPI	UISI	UPSS	FIIT
Membership in editorial boards of scientific journals	4	3	2	9
Membership in programme committees of international scientific conferences	11	20	-	31
Membership in programme committees of national scientific conferences	4	10	6	20
Membership in steering committees of scientific conferences	1	6	-	7

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 of Slovak Republic 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 2007 five VEGA projects and seven APVV projects progressed. Two APVV projects were completed in 2007, two were prolonged and two new projects were submitted for funding in 2008-2010. Three new VEGA projects were prepared and approved for funding 2008-2010.

⁴ UAPI – Institute of Applied Informatics

UISI – Institute of Informatics and Software Engineering

UPSS – Institute of Computer Systems and Networks

Three projects of the Cultural and Educational Grant Agency of the Ministry of Education of Slovak Republic (KEGA) were completed in 2007 and one other progressed in 2007.

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 and under the leadership of M. Šperka in one international project.

<i>Number of projects funded in 2007</i>	UAPI	UISI	UPSS
VEGA	2	1	1
KEGA	3	1	-
APVV	2	3	-
State programmes of research and development	-	1	-
European Social Funds	-	1	1
International projects	1	2	1
FIIT STU	7	9	3

<i>Overview of funds (in thousands SKK)</i>	UAPI	UISI	UPSS	SUM
VEGA	592	1 031	411	2 034
KEGA	165	566	-	731
APVV	838	1 843	-	2 681
State programmes of research and development	-	2 625	-	2 625
European Social Funds	-	1 503	612	2 115
International projects	15	70	406	491
FIIT STU	1 610	7 638	1 429	10 677

The projects were realized in research laboratories (description can be found in the parts devoted to individual institutes). In 2007 projects were realized in the following laboratories from which six are included in the Slovak University of Technology network of high-tech laboratories:

- 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, manager: P. Čičák,
- Embedded Systems Laboratory, manager: T. Krajčovič,
- Laboratory of Virtual Reality, manager: M. Šperka,
- 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.

FIIT STU raised funds for several IT development projects supported by the Ministry of Education of Slovak Republic:

- Farm of virtual and terminal servers, project leader T. Krajčovič,
- Improvement of network infrastructure, project leader T. Krajčovič,
- Parallel computing system of the Grid, project leader L. Hudec,
- Slovak informatics library, project leader M. Šperka.

Prof. Mária Bieliková
Vice-Dean for Research

5 National and International Relations

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 ProFIIT, 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 2007 our faculty participated on the second annual set of CiscoOlymp2007 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., Microsoft Slovakia Ltd. and GTEC Ltd. In cooperation with Cisco Systems 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). Two instructors of our RCNA are trained in Birmingham thanks to remarkable support of the company Soitron Ltd. and DITEC Ltd.

Except above mentioned programmes FIIT STU offers programmes for IP Telephony, WiFi Communication, Network Security and other special courses. In a similar way, in cooperation with Microsoft, FIIT STU joined in 2006 to the IT Academy Program. In 2007 FIIT continued in this co-operation by preparing new instructors.

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 and ORACLE. 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 2007, 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 2007, four incoming Erasmus students have visited FIIT STU (two students from Madrid and two students from Maribor). In 2007, 11 students of our faculty were approved for Erasmus-mobility abroad for various destinations and one teacher has visited the Ghent University.

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 2007, we hosted 8 students from ISEP.

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

Juraj Štefanovič, PhD.
Socrates Erasmus Coordinator

6 Faculty Services

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 5 760 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 49 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,
- 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 130 personal computers and notebooks

of the faculty staff and PhD students, 160 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
Vice-Dean for Services and Development

7 Institute of Applied Informatics

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

Martin Šperka, Assoc. Professor

Juraj Štefanovič, PhD.

Branislav Steinmüller (part time)
 Ondrej Strnád, PhD. (part time)
 Vladimír Vojtek, Professor

Researchers

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

PhD Students

Peter Angelovič
 Peter Drahoš
 Ľuboš Fazekaš
 Martin Hinka
 Peter Jurčovič
 Peter Kapec
 Alena Kovárová
 Juraj Laca
 Peter Lacko
 Michal Takács
 Peter Trebatický
 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
Multimedia Computer Systems	Spring	5	M. Šperka
Evolutionary Algorithms	Spring	5	J. Pospíchal
Neural Networks	Autumn	5	V. Kvasnička
Operating Systems Design	Spring	5	J. Štefanovič

Course	Semester	Credits	Lecturer
Security and Management of Information Systems	Autumn	5	O. Strnád

7.3 Theses

Bachelor (Bc.) Theses

- Aufricht, Igor: *Strategy emergency in game playing*. May 2007.
Supervisor: M. Makula
- Balga, Jozef: *Tracking representing disk activities on-going in Linux kernel*. May 2007. Supervisor: J. Žiak
- Balocký, Stanislav: *Aplication for mobile device*. May 2007.
Supervisor: M. Čerňanský
- Belanec, Michal: *Integrated environment for creation and manipulation with 3D objects*. May 2007. Supervisor: J. Parížková
- Braniša, Gabriel: *Animation and multi-agent system*. May 2007.
Supervisor: M. Šperka
- Brutenič, Jaroslav: *System for web pages management - user*. May 2007.
Supervisor: M. Galbavý
- Bábíček, Robin: *Web system for Millennium Project adjusted for FIIT*. May 2007.
Supervisor: P. Jurčovič
- Červenák, Roman: *Web-based system for central searching for open-source projects*. May 2007. Supervisor: P. Jurčovič
- Čimo, Peter: *Realistic visualization of human face*. May 2007.
Supervisor: P. Drahoš
- Dlugolinský, Štefan: *Pattern recognition in infra camera motion picture*. May 2007. Supervisor: V. Vojtek
- Fris, Martin: *Visualization and navigation in tree structures with the use of alternate graphical interfaces*. May 2007. Supervisor: P. Drahoš
- Ganz, Daniel: *Annotation of documets and semantic search using ontologies*. May 2007. Supervisor: P. Jurčovič
- Gregor, Ján: *SNMP plugin for Total Commander*. May 2007.
Supervisor: P. Trebatický
- Gál, Ivan: *The use of method "taboo search" for stochastic optimization of combinatorial tasks*. May 2007. Supervisor: V. Kvasnička
- Hronec, Michal: *Process synchronization on virtual processor*. May 2007.
Supervisor: J. Štefanovič
- Humay, Pavol: *Collaborative internet pages administration*. May 2007.
Supervisor: J. Štefanovič
- Ilavský, Milan: *Visualisation of graphs based on spring model*. May 2007.
Supervisor: P. Kapec

- Ivanič, Michal: *Collaborative internet pages administration*. May 2007. Supervisor: J. Štefanovič
- Janiš, Pavol: *Realistic visualization of human face*. May 2007. Supervisor: P. Drahoš
- Jariabka, Matej: *The trends in information systems modelling*. May 2007. Supervisor: J. Parížková
- Kajaba, Michal: *Application for mobile devices*. May 2007. Supervisor: M. Čerňanský
- Katona, Ján: *Additional plug-in for Eclipse environment*. May 2007. Supervisor: M. Čerňanský
- Kendera, Matej: *Exam evaluation*. May 2007. Supervisor: M. Makula
- Komáromy, Róbert: *Creating league schedule*. May 2007. Supervisor: P. Trebatický
- Konečný, Tomáš: *How to attend a bar?* May 2007. Supervisor: J. Pospíchal
- Kontúr, Branislav: *e-Health: Wireless Wellness Monitoring (WWM)*. May 2007. Supervisor: V. Vojtek
- Kováč, Dávid: *Annotation of online hypertext documents*. May 2007. Supervisor: P. Jurčovič
- Kožíšek, Jakub: *Modern technologies for web applications*. May 2007. Supervisor: P. Jurčovič
- Krajčovič, Jakub: *Environment for the creation of student projects*. May 2007. Supervisor: B. Steinmüller
- Krátká, Ivana: *Additional plug-in for Eclipse environment*. May 2007. Supervisor: M. Čerňanský
- Litvová, Lenka: *Application for mobile devices*. May 2007. Supervisor: M. Čerňanský
- Lojka, Lukáš: *Plug-in program for Total Commander*. May 2007. Supervisor: P. Trebatický
- Macko, Martin: *Finding the best viewpoint in three-dimensional scene*. May 2007. Supervisor: P. Kapec
- Maláč, Ján: *System for support of building optimal exam schedules*. May 2007. Supervisor: M. Galbavý
- Ochotnický, Stanislav: *Confinement of running processes*. May 2007. Supervisor: B. Steinmüller
- Paulech, Martin: *Application for mobile device*. May 2007. Supervisor: M. Makula
- Pažitný, Michal: *Collaborative visualization*. May 2007. Supervisor: J. Žiak
- Pífková, Hana: *Creation of an intelligent agent using symbolic approach of artificial intelligence*. May 2007. Supervisor: P. Lacko
- Piňák, Andrej: *Simulator of machine instructions flow*. May 2007. Supervisor: J. Parížková

- Poláčik, Michal: *Millennium project*. May 2007. Supervisor: V. Vojtek
- Princzkel, Daniel: *Simulated annealing for solving combinatorial problems*. May 2007. Supervisor: V. Kvasnička
- Rakús, Boris: *Sudoku as SAT or constraint?* May 2007. Supervisor: J. Pospíchal
- Sirotová, Katarína: *e-Health: home care*. May 2007. Supervisor: V. Vojtek
- Sojka, Marek: *Phonetic analysis of sound with artificial neural networks*. May 2007. Supervisor: P. Drahoš
- Svrček, Matúš: *Evolutionary emergence of cooperation in multi-agent systems*. May 2007. Supervisor: V. Kvasnička
- Štekláč, Michal: *Comparison algorithm clustering large set data*. May 2007. Supervisor: P. Lacko
- Ščibrany, Daniel: *Multi-medial information in a regional information system*. May 2007. Supervisor: M. Galbavý
- Tekel', Jakub: *System for realization of tournaments of programs*. May 2007. Supervisor: P. Trebatický
- Tomaschek, Juraj: *Analogy making*. May 2007. Supervisor: J. Pospíchal
- Tomko, Ján: *Simulator of machine instructions flow on Internet*. May 2007. Supervisor: J. Parížková
- Tutko, Peter: *Processing of physical experiments as educational multimedia*. May 2007. Supervisor: A. Kovárová
- Valaška, Ján: *Sudoku as a cognitive problem*. May 2007. Supervisor: J. Pospíchal
- Varga, Lubomír: *Creating inteligent agent by subsymbolic approach of artificial intelligence*. May 2007. Supervisor: P. Lacko

Master (Ing.) Theses

- Belušik, Michal: *Collaboration information system*. December 2007. Supervisor: V. Vojtek
- Chamraz, Lubomír: *Interactive anatomical atlas*. December 2007. Supervisor: M. Šperka
- Cséfalvay, Peter: *Finding heuristics for networks by using genetic programming*. December 2007. Supervisor: J. Pospíchal
- Fülöp, Pavol: *Adaptive mixture of local neural networks*. December 2007. Supervisor: V. Kvasnička
- German, Vladislav: *Automatic meter reading system for gas and water meters*. May 2007. Supervisor: V. Vojtek
- Habala, Michal: *Adaptation of useful dynamics for echo-state networks*. May 2007. Supervisor: M. Čerňanský
- Hablák, Martin: *Predictive data mining using decision trees*. May 2007. Supervisor: P. Angelovič

- Homola, Michal: *Searching for global minimum of function via quantum computing*. December 2007. Supervisor: V. Kvasnička
- Hromádka, Lubomír: *Parallel game-tree search*. May 2007. Supervisor: P. Lacko
- Kekerová, Stanislava: *Language as a small world network*. May 2007. Supervisor: M. Markošová
- Kobza, Michal: *Adaptive decision making and controlling in distributed environment*. December 2007. Supervisor: J. Štefanovič
- Kocsisová, Silvia: *Clustering by Ants*. December 2007. Supervisor: J. Pospíchal
- Kováčik, Matúš: *Study of operating system Solaris advanced features*. December 2007. Supervisor: J. Štefanovič
- Ledňa, Peter: *Study of the properties of algorithms of quantum computing through the program Mathematica*. December 2007. Supervisor: V. Kvasnička
- Majer, Juraj: *Recurrent neural network simulator*. December 2007. Supervisor: M. Čerňanský
- Mešťaník, Peter: *Adaptive mixture of local neural networks*. May 2007. Supervisor: V. Kvasnička
- Őlvecký, Tomáš: *Identification and tracking of topics in news stream*. December 2007. Supervisor: P. Jurčovič
- Petriščák, Martin: *Optimization of Echo state neural networks using particle swarm optimization*. December 2007. Supervisor: J. Pospíchal
- Petráková, Zuzana: *Solving tasks by approaches based on support vector machines*. December 2007. Supervisor: M. Čerňanský
- Práznovská-Vavříková, Martina: *Distributed data management*. December 2007. Supervisor: J. Štefanovič
- Ruttkay-Nedecký, Peter: *Environment for distributed sharing of information*. December 2007. Supervisor: J. Štefanovič
- Tatranský, Tomáš: *Small world model in Echo state neural network*. May 2007. Supervisor: J. Pospíchal
- Tóth, Tomáš: *Augmented reality application in cultural heritage presentation*. December 2007. Supervisor: M. Šperka
- Vilina, Pavol: *Optimalization of selection criterion in random forest*. December 2007. Supervisor: P. Angelovič
- Žák, Adam: *Management of distributed data*. May 2007. Supervisor: J. Štefanovič

Doctoral (PhD.) Theses

Student name: Michal Čerňanský, Ing.
Degree program: Applied informatics
Thesis title: Comparison of Recurrent Neural Networks with Markov Models on Complex Symbolic Sequences
Supervisor: Ľubica Beňušková, Assoc. Professor
Defended on: February 2, 2007

Annotation: Recurrent neural networks can be used for processing structured data such as sequences, trees or graphs. In practice it is often difficult to train the network to an actual task. Recently a lot of attention was devoted to the neural models with contractive dynamics based on fixed point attractors. In this thesis, the behaviour of an untrained, randomly initialized recurrent neural network is studied and the phenomenon called Markovian architectural bias is explained. Models based on this property are then described including the novel echo state network. The thesis demonstrates that the history of symbols presented to the network is exploited similarly as in Markov models and the correspondence between them and variable length Markov models is shown. Different training approaches and different architectures are compared on tasks of the next symbol prediction using different complex symbolic sequences. Advanced training approaches based on the Kalman filtration often outperform standard training algorithms also when processing symbolic sequences.

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 industries, 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

Theoretical study and practical applications of recurrent neural networks based on architectural bias (APVT-20-030204)

Project leader: M. Čerňanský
Members: M. Makula, P. Trebatický, P. Lacko
Supported by: Slovak Research and Development Agency
Duration: January 2005 – December 2007
Description: Markovian architectural bias is a property related with a fixed point attractor state space dynamics of architectures with recurrent connections. Models such as neural prediction machine and fractal prediction machine successfully use this type of dynamics, as well as the novel Echo State Networks with huge randomly interconnected hidden layer. We study the network's state space dynamics and its possible adjustment so some specific sequences can be successfully processed by proposed methods. We will specify practical problem domains (for example image or sound processing), where proposed approaches can be used.

Application of Artificial Intelligent Methods in Modelling and Control of Critical Processes in Power Industry (APVT-20-031404)

Project leader: Š. Kozák
Members: researchers from FEI STU
Supported by: Slovak Research and Development Agency
Duration: January 2005 – December 2007
Description: The main objective is to develop the supporting program system AUIKE for optimization of decision-making and control of critical processes in energetic. The supporting program system AUIKE will use methods of artificial intelligence based on fuzzy logic, artificial neural networks and genetic algorithms. For practical application AUIKE will be developed and implemented as independent module, which

will create the software superstructure for large-scale control systems. The respective data will be filled in on-line, their activation in the solution will be realized off-line according to evaluation of real situation in the process either in automatic or in manual regime.

Research and Development of HW and SW Modules of Positioning Sensoric Systems Carriers (APVV-99-P05305)

Project leader: Electrotechnical research and development institute (FIIT STU, Š. Kozák)
Members: researchers from FEI STU
Supported by: Slovak Research and Development Agency
Duration: January 2005 – December 2007
Description: One of today EU priorities is to guarantee protection of its outer border, protect against terrorism and provide citizens security at workplace, in transport means, in leisure activity areas, etc. The sensor systems belong between technical means intended for this protection and area surveillance installed on for this purpose designed carriers. Project objective is research and development of HW and SW modules for positioning carriers of sensor systems. Research and development is based on use of the latest knowledge in the field of design and optimization of carrier's mechanical structures, research and development of new servo-systems, control structures, software, etc, and technicians' knowledge and experience.

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.

New forms of higher education in the "Artificial Intelligence" field of study in Slovakia (KEGA, 3/3135/05)

Project leader: Technical University in Košice (FIIT STU, V. Kvasnička)
Partners: FEI TU Košice
Members: V. Kvasnička, J. Pospíchal, M. Čerňanský

<i>Supported by:</i>	Cultural and Educational Grand Agency of the Ministry of Education of Slovak Republic
<i>Duration:</i>	January 2005 – December 2007
<i>Description:</i>	The project is oriented on the creation of the new technologies of artificial intelligence learning and creation of textbooks in Artificial Intelligence and Applied Informatics at the Slovak universities. Cooperating workplaces cover universities activities in Slovakia in the fields of artificial intelligence as an important part of informatics. The aim is to create and prepare e-courses in the field of artificial intelligence, lectures for master study and e-learning texts for PhD study. In 2nd and 3rd year the project will devote to creation and development of the learning centres for artificial intelligence on the cooperating workplaces. Web study texts, learning texts, and infrastructure for pedagogical cooperation of project researchers with the aim of human potential integration in the field of artificial intelligence learning in the conditions of Slovak universities will be the project result.

Artistic forms in communication design (KEGA, 3/3253/05)

<i>Project leader:</i>	Faculty of architecture, main investigator Ľ. Horník STU (FIIT STU, M. Šperka)
<i>Partners:</i>	FA STU Bratislava
<i>Members:</i>	M. Šperka
<i>Supported by:</i>	Cultural and Educational Grand Agency of the Ministry of Education of Slovak Republic
<i>Duration:</i>	March 2005 – December 2007
<i>Description:</i>	The project solves principal formulated model of university preparation for design area (visual communication and multimedia design) at STU in Bratislava. It completes the present vacuum in the preparation of university educated experts for area of communication design with accent to artistic creation in the cyberspace (multimedia document, graphic design and videoart). Special work is preparation of lecture theme of theoretical subjects on CD ROMs.

Study in design of interactive digital media (KEGA, 3/3206/05)

<i>Project leader:</i>	M. Šperka
<i>Members:</i>	A. Kovárová, O. Zemanovičová
<i>Supported by:</i>	Cultural and Educational Grand Agency of the Ministry of Education of Slovak Republic
<i>Duration:</i>	January 2005 – December 2007
<i>Description:</i>	The goal of the project is to prepare conception of interdisciplinary study program “The design” of such interfaces requires the knowledge and skills from the informatics as well as from design fields. In many countries exist special university level schools dedicated to this area of study, but in Slovakia does not exist. Optimal solution is to create this study program in the frames of existing infrastructure, e.g. Slovak University of Technology.

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

- Project leader:* V. Vojtek
- Members:* V. Kvasnička, M. Šperka, J. Štefanovič, J. Pospíchal, M. Galbavý, V. Solčány, J. Parížková, P. Angelovič, A. Kovárová, M. Takáč, J. Žiak, P. Jurkovič
- 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.

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. Zemančíčová, J. Žiak, M. Čerňanský, Ľ. 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.

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

- Project leader:* STU, M. Šperka,
- Contractor:* Eva Sorum Poulsen, Herning Institute of Business Administration and Technology, Denmark

<i>Countries:</i>	BE, DE, FI, IS, PL,
<i>Supported by:</i>	Socrates programme of the European Commission,
<i>Duration:</i>	October 2006 – September 2009
<i>Description:</i>	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

- BABINEC, Š., POSPÍCHAL, J.: Improving the Prediction Accuracy of Echo State Neural Networks by Anti-Oja's Learning. In: *Lecture Notes in Computer Science*. ISSN 0302-9743. Vol. 4668, Springer-Verlag Berlin Heidelberg, 2007, pp. 19-28.
- BABINEC, Š., POSPÍCHAL, J.: Optimization of Echo State Neural Networks for Electrical Load Forecasting. In: *Neural network world*. ISSN 1210-0552. Vol. 17, No. 2 2007, pp. 133-152.
- ČERŇANSKÝ, M., TIŇO, P.: Comparison of Echo State Networks with Simple Recurrent Networks and Variable-Length Markov Models on Symbolic Sequences. In: *Lecture Notes in Computer Science*. ISSN 0302-9743. Vol. 4668. Springer-Verlag Berlin Heidelberg, 2007, pp. 618-627.
- ČERŇANSKÝ, M., MAKULA, M., BEŇUŠKOVÁ, E.: Organization of the State Space of a Simple Recurrent Network before and after Training on Recursive Linguistic Structures. In: *Neural Networks*. ISSN 0893-6080. Vol. 20, 2007, pp. 236-244.
- KVASNIČKA, V., POSPÍCHAL, J.: Artificial Chemistry and Replicator Theory of coevolution of Genes and Memes. In: *Collection of Czechoslovak Chemical Communications*. ISSN 0010-1765. Vol. 72, No. 2, 2007, pp. 223-251.
- PARÍZKOVÁ, J.: Effectiveness of Program Working with the File. In: *Informatika v škole*. ISSN 1335-616X. No. 32, 2007, pp. 12-15. (in Slovak)
- PARÍZKOVÁ, J.: Coding of Selected Operations in a Program. In: *Informatika v škole*. ISSN 1335-616X. No. 32, 2007, pp. 16-19. (in Slovak)
- PARÍZKOVÁ, J.: Comparison of Chosen Program Schemes. In: *Slovenský učiteľ*, Príloha Technológie vzdelávania. ISSN 1335-3632. 2007, pp. 14-15.

International Conferences

- ČERŇANSKÝ, M., MAKULA, M., TREBATICÝ, P., LACKO, P.: Text Correction Using Approaches Based on Markovian Architectural Bias. In: *EANN 2007*, Proc. of the 10th Int. Conf. on Engineering Applications of Neural Networks, Thessaloniki, Greece, 2007. pp. 221-228.
- DRAHOŠ, P., ŠPERKA, M.: Face Expressions Animation in e-Learning. In: *E-Learning Conference'06*, Computer Science Education with a section PhD Students & e-learning, University of Rouse, 2007. pp. 13-18.

- JÁNOŠ, I.: Multi-CPU Video Processing. In: *CESCG 2007*, Proc. of the 11th Central European Seminar on Computer Graphics, Budmerice, Vienna University of Technology, 2007. pp. 183-187.
- KOVÁROVÁ, A., DOBIŠ, M., HLAVÁČEK, V., HOANG, L., JAJCAJ, M., LAMOŠ, D.: ICPoint - Interactive Night Sky Observation. In: *ICETA 2007*, 5th Int. Conf. on Emerging e-Learning Technologies and Applications. Stará Lesná, Slovak Republic, 2007. pp. 255-260.
- KOZÁK, Š.: Virtual PID Toolbox (VPT). In: *EUROSIM 2007*, Proc. of the 6th EUROSIM Congress on Modelling and Simulation, Vol.2: Full Papers (CD). Ljubljana, Slovenia, 2007.
- SOLČÁNY, V., ŠAFAŘÍK, J.: Experimental Evaluation of Cumulative Lookahead in Conservative Parallel Simulation. In: *EUROSIM 2007*, Proc. of the 6th EUROSIM Congress on Modelling and Simulation, Vol.2: Full Papers (CD). Ljubljana, Slovenia, 2007.
- ŠPERKA, M., KOVÁROVÁ, A.: Digital Media Engineering and Design: Proposals for the Interdisciplinary Study Program. In: *ICETA 2007*, 5th Int. Conf. on Emerging e-Learning Technologies and Applications. Stará Lesná, Slovak Republic, 2007. pp. 341-346.
- ŠPERKA, M., KOVÁROVÁ, A.: Interdisciplinary and International Study Programs in Digital Media Design and Engineering. In: *Virtual University VU '07*: 8th Int. Conf., Bratislava, Slovak Republic, 2007. pp. 160-164.
- VARCHOLA, A., VAŠKO, A., SOLČÁNY, V., DIMITROV, L., ŠRÁMEK, M.: Processing of Volumetric Data by Slice- and Process-Based Streaming. In: *Afrigraph 2007*, Proc. of the 5th Int. Conf. on Virtual Reality, Computer Graphics, Visualization and Interaction in Africa, Grahamstown, South Africa, 2007. New York: SIGGRAPH: ACM SIG on Computer Graphics and Interactive Techniques. pp. 101-110.

Local and National Conferences

- BOBRÍK, M.: RNA-like artificial Life System with a Spatial Structure. In: *Cognition and Artificial Life VII.*, Opava: Slezská univerzita. pp. 55-63.
- ČERŇANSKÝ, M., MAKULA, M.: Processing Symbolic Sequences Using Echo State Networks. In: *Cognition and Artificial Life VII.*, Opava: Slezská univerzita. pp. 93-98. (in Slovak)
- FLOCHOVÁ, J., GALBAVÝ, M.: Database Technology and Industrial Transaction Techniques in Control Education. In: *Selected Topics in Modelling and Control Vol. 5*. Bratislava: STU v Bratislave, pp. 63-68.
- HABALA, M., ČERŇANSKÝ, M.: Adaptation of Useful Dynamics for Echo State Networks. In: *Cognition and Artificial Life VII.*, Opava: Slezská univerzita. pp. 121-124. (in Slovak)
- JURČOVIČ, P.: Topic Detection in News Stories. In: *Student Research Conference 2007*. 3rd Student Research Conference in Informatics and Information Technologies Bratislava, Supervisor: V. Vojtek, 2007, pp. 225-232.

- KAPEC, P.: Software Visualization in Three Dimensions: A Survey. In: *Student Research Conference 2007*. 3rd Student Research Conference in Informatics and Information Technologies Bratislava, Supervisor: M. Šperka, 2007, pp. 285-292.
- KASAN, P.: Hierarchical Structural Memory. In: *Cognition and Artificial Life VII.*, Opava: Slezská univerzita. pp. 173-178
- KOVÁROVÁ, A.: Digital Media Design: Survey of Requirements on Interdisciplinary Study Program. In: *Student Research Conference 2007*. 3rd Student Research Conference in Informatics and Information Technologies Bratislava, Supervisor: M. Šperka, 2007, pp. 293-300.
- KÖRÖSI, L., KOZÁK, Š.: Optimal Self Tuning Neural Network Controller Design. In: *Selected Topics in Modelling and Control* Vol. 5. Bratislava: STU v Bratislave, 2007. pp. 86-91.
- KVASNIČKA, V., POSPÍCHAL, J.: Bounded Rationality from the Viewpoint of Cognitive Science and Artificial Intelligence. In: *Connection to Cybernetics, Informatics and Artificial Intelligence*, 2007. pp. 40-50. (in Slovak)
- KVASNIČKA, V.: Cognitive Logic. In: *Cognition and Artificial Life VII.*, Opava: Slezská univerzita. pp. 201-206. (in Slovak)
- LACKO, P.: Reinforcement Learning in Artificial Intelligence. In: *Student Research Conference 2007*. 3rd Student Research Conference in Informatics and Information Technologies Bratislava, Supervisor: V. Kvasnička, 2007. pp. 241-248.
- PAULUSOVÁ, J., KOZÁK, Š., DÚBRAVSKÁ, M.: Fuzzy Logic Autotuning Methods for PID Controller Applied to Nonlinear Process. In: *Process Control 2007*, 16th Int. Conf., Štrbské Pleso, Slovak Republic, 2007. (CD)
- PAULUSOVÁ, J., KOZÁK, Š., DÚBRAVSKÁ, M.: Fuzzy-Neuro Predictive Control for Nonlinear Process. In: *Process Control 2007*: 16th Int. Conf., Štrbské Pleso, Slovak Republic, 2007. (CD).
- POSPÍCHAL, J.: Optimisation of Topology of Networks. In: *Cognition and Artificial Life VII.* Opava: Slezská univerzita. pp. 275-279. (in Slovak)
- ŠKOVAN, I., KOVÁROVÁ, A.: Design and Comparison of Educative 2D and 3D Simulation. In: *SCO 2007*. Sharable Content Objects. Brno, Czech Republic, 2007. pp. 113-118. (in Slovak)
- ŠTEFANOVIČ, J., VOJTEK, V.: An automatic Collaborative Support for Distributed Knowledge Warehouse. In: *Informatics 2007*, Proc. of the 9th Int. Conf. on Informatics. Bratislava, Slovakia, pp. 177-181.
- ŠTEFANOVIČ, J., VOJTEK, V., POLÁČIK, M., BELUŠÍK, M.: An Electronic Delphi Method for Decision support. In: *Communication and information technologies*. Proc. of abstracts, Tatranské Zruby, Slovakia, 2007. pp. 4-11. (in Slovak)
- ŠTEFANOVIČ, J., VOJTEK, V.: Collaborative Communicating Agents for Distributed Knowledge. In: *Cognition and Artificial Life VII.*, Opava: Slezská univerzita. pp. 337-340. (in Slovak)

TREBATICKÝ, P.: Application of Modified Kalman Filters in Training of Neural Networks. In: *Cognition and Artificial Life VII.*, Opava: Slezská univerzita. pp. 349-355. (in Slovak)

TREBATICKÝ, P.: Kalman Filter Modifications for Neural Network Training. In: *Student Research Conference 2007*. 3rd Student Research Conference in Informatics and Information Technologies Bratislava, Supervisor: J. Pospíchal, pp. 257-264.

Books

KVASNIČKA, V., TREBATICKÝ, P., POSPÍCHAL, J., KELEMEN, J. (EDS.): *Mind, intelligence and life*. Bratislava, Slovak University of Technology, 2007. 517 p. (in Slovak)

KELEMEN, J., KVASNIČKA, V., POSPÍCHAL, J.: *Cognition and Artificial Life t VII*. Opava, Slezská univerzita, 2007. 395 p. (in Slovak)

Parts of Books

KVASNIČKA, V.: Molecular darwinian evolution in silico. In: *Mind, intelligence and life*. (Myseľ, inteligencia a život). Bratislava: STU Publishing Bratislava, 2007. pp. 441-464. (in Slovak)

POSPÍCHAL, J., KVASNIČKA, V.: Evolution of language and universal darwinism. In: *Mind, intelligence and life*. (Myseľ, inteligencia a život). Bratislava: STU Publishing Bratislava, 2007. pp. 475-496 (in Slovak)

TREBATICKÝ, P.: Text correction using echo state networks. In: *Mind, intelligence and life*. (Myseľ, inteligencia a život). Bratislava: STU Publishing Bratislava, 2007. pp. 357-368. (in Slovak)

Textbooks

ŠTEFANOVIČ, J.: Basics of operating systems. Bratislava: STU v Bratislave FIIT, 2007. 105 p. ISBN 978-80-227-2586-6. (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

- *M. Šperka*: JDMDE project meeting, University Bialsko-Biala, Poland, March 28-30, 2007
- *M. Čerňanský*: Dijon, France, April 11-15, 2007
- *M. Čerňanský*: EANN 2007, Thessaloniki, Greece, August 28 - September 1, 2007
- *Š. Kozák, V. Solčány*: EUROSIM 2007, Ljubljana, Slovenia, September 8-13, 2007
- *V. Kvasnička*: Cognition 2007, Olomouc, Czech Republic, September 27-29, 2007
- *M. Šperka*: JDMDE project meeting, Universitat Politècnica de Catalunya (UPC), Barcelona, Spain, October 23-27, 2007
- *J. Štefanovič*: CSEW 2007, Peršlák, Czech Republic, October 25-26, 2007
- *P. Trebatický + 6 students*: ACM ICPC, Prague, Czech Republic, November 9-12, 2007
- *M. Šperka*: EADiM Academic Network Conference, Graz, Austria, November 22-25, 2007

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)

Jiří Pospíchal

- EUROFUSE, EURO Working group on fuzzy sets (member, since 1999)

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
- 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
- APVV, Slovak Research and Development Agency – Š. Kozák, member of committee for technical sciences
- ITI 2007 – 29th International Conference on Information Technology Interfaces, Dubrovnik – V. Vojtek: member of programme committee
- Cognition and Artificial Life VII, Smolenice, – V. Kvasnička: the head of the organizing and scientific committee, J. Pospíchal, M. Čerňanský: members of programme committee organizers
- MENDEL 2007 – 13th International Conference on Soft Computing, Prague, Czech Republic – V. Kvasnička, J. Pospíchal: members of programme committee
- SCCG 2007 – Spring Conference on Computer Graphics, Budmerice castle, Slovakia – M. Šperka: member of programme committee
- CESC 2007 – Central European Seminar on Computer Graphics, Budmerice castle, Slovakia – M. Šperka: member of programme committee
- WEBIST 2007 – 3rd International Conference on Web Information Systems, Barcelona, Spain – M. Šperka: member of programme committee
- VU 2007 – 8th International Conference Virtual University, Bratislava, Slovakia – M. Šperka: member of programme committee
- BIOCAMP 2007- The 2007 International Conference on Bioinformatics & Computational Biology, Monte Carlo Resort, Las Vegas, Nevada, USA – V. Kvasnička, J. Pospíchal: members of programme committee
- GEM 2007- The 2007 International Conference on Genetic and Evolutionary Methods, Monte Carlo Resort, Las Vegas, Nevada, USA – V. Kvasnička, J. Pospíchal: members of programme committee
- INFORMATICS 2007, Bratislava, – V. Kvasnička: member of programme committee

8 Institute of Computer Systems and Networks

E-mail: upss@fiit.stuba.sk
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Tel: + 421 2 654 22 707
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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.

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

Milan Kolesár, Professor (till March 2007)
Ladislav Hudec, Assoc. Professor (since April 2007)

Deputy Director

Ladislav Hudec, Assoc. Professor (till March 2007)
Tibor Krajčovič, Assoc. Professor (since April 2007)

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)
Ján Hudec
Ladislav Hudec, Assoc. Professor
Katarína Jelemenská, PhD.
Milan Kolesár, Professor
Margaréta Kotočová, Assoc. Professor
Tibor Krajčovič, Assoc. Professor
Dušan Malina
Elena Tomalová

Researchers

Adrian Bagala
Dušan Bernát
Jamal Hasan, PhD.
Daniela Kotmanová

PhD Students

Hossam el-ddin Mostafa Hussin
Michal Zimen

8.2 Teaching

Undergraduate Study (Bc.)

Course	Semester	Credits	Lecturer
Computer Architecture	Spring	6	M. Kolesár
Computer Application Methods	Spring	6	P. Čičák
Computer Networks II	Autumn	6	I. Grellneth
Computer Networks I	Spring	6	M. Kotočová
Engineering Methods	Autumn	4	P. Čičák

Course	Semester	Credits	Lecturer
Final Bachelor Project I-II	Autumn Spring	3-9	M. Kolesár
Machine and System Level Programming	Autumn	5	P. Čičák
Microcomputers	Autumn	6	T. Krajčovič
Logic Circuits	Autumn	6	M. Kolesár
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.)

Course	Semester	Credits	Lecturer
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 Security	Autumn	5	L. Hudec
Computing Systems Research	Autumn	1	M. Kolesár
Diagnostics and Reliability	Spring	5	E. Gramatová
Digital Systems Design	Spring	5	K. Jelemenská
Digital Systems Testing	Autumn	5	E. Gramatová
Diploma Project I-III (Computer Systems and Networks)	Autumn Spring	4-10-21	M. Kolesár
Distributed Computer Systems	Autumn	5	D. Bernát
Embedded Systems	Autumn Spring	5	T. Krajčovič
Internet Security	Spring	5	L. Hudec
Reconfigurable Digital Systems	Spring	5	J. Flochová
Team Project I-II (Computer Systems and Networks)	Autumn Spring	5-6	J. Hudec

8.3 Theses

Bachelor (Bc.) Theses

- Bartoš, Miroslav: *Interactive system for assigning students into classes.* May 2007. Supervisor: B. Dado
- Beleš, Štefan: *Automatic design of combinational logical circuits using integrated ROM memories.* May 2007. Supervisor: M. Kolesár
- Belica, Peter: *Modular information system.* May 2007. Supervisor: K. Jelemenská

- Beňovský, Marián: *Access control system in informational security systems*. May 2007. Supervisor: J. Hasan
- Bilík, Michal: *Functional test generator for VLSI circuits*. May 2007. Supervisor: J. Hudec
- Bánik, Tomáš: *Design of wireless network using LWAPP technology in the inner environment*. May 2007. Supervisor: E. Benča
- Böhm, Lukáš: *IPv6 Theory and praxis*. May 2007. Supervisor: I. Grellneth
- Čelko, Matúš: *Simulator of a computer working on the level of inter-register transfers*. May 2007. Supervisor: E. Tomalová
- Danillová, Eva: *IPv6 – the theory and implementation*. May 2007. Supervisor: I. Grellneth
- Fajnor, Matej: *The support of teaching of the subject ASP3*. May 2007. Supervisor: P. Čičák
- Figura, Miroslav: *Boolean functions' minimization*. May 2007. Supervisor: E. Tomalová
- Formanko, Martin: *Software support for education computer networks*. May 2007. Supervisor: D. Malina
- Gregor, Vladimír: *Cisco devices configurations comparison system*. May 2007. Supervisor: B. Dado
- Gómez, Ramón Vladimir Leandro: *Microcomputer 8051 based autonomous vehicle*. May 2007. Supervisor: T. Krajčovič
- Hammoud, Riad: *Autonomous vehicle based on a microcontroller*. May 2007. Supervisor: T. Krajčovič
- Holotík, Peter: *Congestion control in TCP/IP networks*. May 2007. Supervisor: M. Kotočová
- Hrubša, Juraj: *Software support of teaching of the subject ASP 2*. May 2007. Supervisor: P. Čičák
- Jakubis, Peter: *Visualization of STP on computer*. May 2007. Supervisor: I. Grellneth
- Janeček, Marek: *Creation of program environment for scanning biopotentials in Labview*. May 2007. Supervisor: P. Hubka
- Jurikovič, Matej: *Automatic design of combinational logical circuits using integrated memories ROM*. May 2007. Supervisor: M. Kolesár
- Kalanin, Peter: *Safety of spanning-tree protocol*. May 2007. Supervisor: D. Malina
- Katreniak, Radoslav: *Distributing calculations*. May 2007. Supervisor: M. Kotočová
- Kimák, Peter: *The Design and implementation of a system for graphic visualization of activity cache memory on computer*. May 2007. Supervisor: J. Hudec
- Kiršner, Peter: *Education and demonstration system for learning issues of mapping data in computer*. May 2007. Supervisor: E. Tomalová

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- Knotka, Peter: *Congestion control in TCP/IP network*. May 2007.
Supervisor: M. Kotočová
 - Komorovský, Filip: *Visualization of STP tree on computer*. May 2007.
Supervisor: I. Grellneth
 - Kopecký, Peter: *Creation of activation model of basic element of information processing in brain's cortex*. May 2007. Supervisor: P. Hubka
 - Kostroš, František: *Group minimization of logic functions – OS Windows application*. May 2007. Supervisor: E. Tomalová
 - Krajčo, Tomáš: *Job submission in grid*. May 2007. Supervisor: A. Bagala
 - Krištofik, Štefan: *Construction of serial-parallel contact-diode (1,m)-poles*. May 2007. Supervisor: M. Kolesár
 - Kvasničák, Peter: *Boolean functions - HTML application*. May 2007.
Supervisor: E. Tomalová
 - Letkovský, Andrej: *Tools for support of tuition of the subject ASP5*. May 2007.
Supervisor: P. Čičák
 - Lorinc, Benjamín: *Experimental microcomputer on AT89S52 basis*. May 2007.
Supervisor: T. Krajčovič
 - Lörinc, Filip: *Regional Cisco academy information system*. May 2007.
Supervisor: B. Dado
 - Madaj, Tomáš: *Production readiness of information systems*. May 2007.
Supervisor: R. Hollosy
 - Magula, Peter: *Congestion control in TCP/IP networks*. May 2007.
Supervisor: M. Kotočová
 - Mayer, Matej: *Design and implementation of the graphical visualization system for selected operations of computer memory subsystem*. May 2007.
Supervisor: J. Hudec
 - Michalák, Juraj: *Forensic tools for collection of digital evidence*. May 2007.
Supervisor: L. Hudec
 - Mika, Miroslav: *Internet business portal*. May 2007. Supervisor: M. Jankovič
 - Mózes, Tomáš: *Tuition support means for the ASP course 4*. May 2007.
Supervisor: P. Čičák
 - Nagy, Attila: *Simulator of a computer on register transfer level – HTML application*. May 2007. Supervisor: E. Tomalová
 - Nemsila, Maroš: *Congestion control in TCP/IP networks*. May 2007.
Supervisor: M. Kotočová
 - Panák, Stanislav: *Program system for systems monitoring and breakdown diagnostics*. May 2007. Supervisor: J. Flochová
 - Pavlovič, Anton: *Interactive system for integrating students into study groups*. May 2007. Supervisor: B. Dado
 - Perašín, Matej: *Measuring system with PC - modification*. May 2007.
Supervisor: R. Kinder

- Petráš, Martin: *Design and Implementation of the graphical visualization system for the instruction pipeline*. May 2007. Supervisor: J. Hudec
- Pivarč, Peter: *Application support for learning of computer networks*. May 2007. Supervisor: D. Malina
- Pištek, Peter: *Automatic design of combinational logical circuits using MSI integrated circuits*. May 2007. Supervisor: M. Kolesár
- Pokorný, Peter: *Automatic synthesis of VHDL descriptions*. May 2007. Supervisor: K. Jelemenská
- Polák, Tomáš: *Automatic synthesis of VHDL models of digital systems*. May 2007. Supervisor: K. Jelemenská
- Rabčan, Ľuboš: *Creation of activation model of basic element of information processing in brain's cortex*. May 2007. Supervisor: P. Hubka
- Schmotzer, Marián: *Reliable data storage*. May 2007. Supervisor: D. Bernát
- Sečanský, Igor: *Automatic design of serial-parallel contact-diode (1,m)-gate circuits*. May 2007. Supervisor: M. Kolesár
- Sirko, Tomáš: *Warehouse information system*. May 2007. Supervisor: D. Malina
- Sobolič, Marek: *Simplification of Boolean Functions*. May 2007. Supervisor: E. Tomalová
- Stanovský, Peter: *Reliability analysis of restored systems*. May 2007. Supervisor: J. Hudec
- Šandala, Tomáš: *Business Analysis of Information Systems*. May 2007. Supervisor: P. Bukovský
- Štroffek, Michal: *Simulator design in communication networks*. May 2007. Supervisor: I. Kotuliak
- Šťastný, Tomáš: *Safety architecture and models*. May 2007. Supervisor: J. Hasan
- Tkáč, Michal: *Business Analyst of Information systems*. May 2007. Supervisor: P. Bukovský
- Tölgyessy, Michal: *Analysis of latency in computer networks*. May 2007. Supervisor: D. Bernát
- Valach, Ján: *System level monitoring of information system*. May 2007. Supervisor: R. Hollosy
- Vanek, Lukáš: *Means to support teaching of ASP1 subject*. May 2007. Supervisor: P. Čičák
- Viceník, Martin: *Experimental Microcomputer based on AT89S52*. May 2007. Supervisor: T. Krajčovič
- Vilhan, Peter: *Environmental monitoring in wireless networks*. May 2007. Supervisor: D. Bernát
- Vrábel, Marek: *Creation of activation model of basic element of information processing in brain's cortex*. May 2007. Supervisor: P. Hubka
- Žucha, Marián: *Design of bridge contact-diode (1,m) - pole*. May 2007. Supervisor: M. Kolesár

- Žáry, Matej: *Analysis of delays in computer networks*. May 2007. Supervisor: D. Bernát

Master (Ing.) Theses

- Borlok, Ján: *System for asynchronous sequential circuits synthesis, HTML application*. May 2007. Supervisor: E. Tomalová
- Božoňová, Zuzana: *Methods for supervisory management of discrete event systems and their simulation*. December 2007. Supervisor: J. Flochová
- Brosz, Juraj: *Support of distance education at Regional Cisco Academy*. May 2007. Supervisor: B. Dado
- Cerva, Martin: *E-learning support – learning content module*. May 2007. Supervisor: B. Dado
- Čahoj, Igor: *Support of distance learning – module for online testing*. May 2007. Supervisor: B. Dado
- Dobai, Roland: *E-system for online testing*. December 2007. Supervisor: E. Gramatová
- Fülöp, Roman: *Adaptive management of transmission channel characteristics*. December 2007. Supervisor: D. Bernát
- Gecelovský, Marek: *Cipher network connection*. May 2007. Supervisor: T. Török
- Gembický, Štefan: *Different approaches to modelling multimedia applications*. May 2007. Supervisor: D. Malina
- Hanuliak, Ľubomír: *Security in grid computing*. May 2007. Supervisor: A. Bagala
- Haulik, Matej: *Communication module for measurement and control unit*. December 2007. Supervisor: P. Čičák
- Heriban, Ľuboš: *Failure diagnostic based on Petri Net models*. December 2007. Supervisor: J. Flochová
- Hubatý, Tomáš: *Cache simulator - HTML application*. December 2007. Supervisor: E. Tomalová
- Janovič, Marian: *Measuring system with PC*. May 2007. Supervisor: R. Kinder
- Korenica, Milan: *Virtual University*. May 2007. Supervisor: B. Dado
- Krakovský, Michal: *Simulator of VHDL language*. December 2007. Supervisor: K. Jelemenská
- Krištof, Ján: *Software support for simulation of selected hybrid ARQ methods*. December 2007. Supervisor: D. Malina
- Krištofik, Jakub: *Monitoring and maintenance the operating system condition*. December 2007. Supervisor: D. Bernát
- Kropáček, Miroslav: *Simulation Tool for RISC CPU*. December 2007. Supervisor: T. Török
- Kvasnička, Martin: *Loop problem in Ethernet networks at the second RM OSI layer, solution, visualization*. December 2007. Supervisor: I. Grellneth

- Laho, Tomáš: *Functional test generator of VLSI circuits*. May 2007. Supervisor: J. Hudec
- Lenz, Roman: *System for asynchronous sequential circuits synthesis*. May 2007. Supervisor: E. Tomalová
- Malast, Roman: *Measuring and evaluating quality of service parameters in TCP/IP networks*. May 2007. Supervisor: M. Kotočová
- Markusek, Peter: *Test generation e-system for digital circuits*. May 2007. Supervisor: E. Gramatová
- Mateja, Miroslav: *Problems in realization of combination logical circuits, HTML application*. December 2007. Supervisor: E. Tomalová
- Melicherčík, Milan: *The design of the Ethernet switch for the PLD devices*. May 2007. Supervisor: J. Hudec
- Mičuda, Maroš: *E-system for reliability of digital systems*. May 2007. Supervisor: E. Gramatová
- Nagy, Benedikt: *Simulator of computer on register transfer level*. December 2007. Supervisor: E. Tomalová
- Novická, Lucia: *Automatic system for tests compressions of digital circuits*. December 2007. Supervisor: E. Gramatová
- Osvald, Drahomír: *Simulator of CACHE Memory – application for OS Windows*. December 2007. Supervisor: E. Tomalová
- Peev, Igor: *Multimedia learning system for course Architecture of computer systems*. December 2007. Supervisor: J. Hudec
- Polačko, Peter: *Online education of specification and descriptive languages*. May 2007. Supervisor: K. Jelemenská
- Strhan, Michal: *Principles and visualization of STP*. May 2007. Supervisor: I. Grellneth
- Šinkovič, Peter: *Correspondence course learning support in Specification and description languages course*. May 2007. Supervisor: K. Jelemenská
- Tlacháč, Viktor: *Vehicle State Monitoring Through CAN Bus*. December 2007. Supervisor: D. Malina
- Tréger, Milan: *Software support for designing and planning*. December 2007. Supervisor: P. Čičák
- Uherčík, Matúš: *Supervisory control – design and implementation of an algorithm for G. Stremersch method*. December 2007. Supervisor: J. Flochová
- Velecký, Michal: *Automatic design of logical combination circuits TANT*. December 2007. Supervisor: M. Kolesár
- Venczel, Ladislav: *Functions design of Network Interface Card in PLD environment*. May 2007. Supervisor: J. Hudec
- Vesel, Marek: *Deleted files recovery support in the Unix OS*. December 2007. Supervisor: D. Bernát

Doctoral (PhD.) Theses

- Student name:* Hossan el-ddin Mostafa Hussin
Degree program: Computer Hardware and Systems
Thesis title: New Communication Methods in Mobile Computer Networks
Supervisor: Pavel Čičák, Assoc. Professor
Defended on: October 23, 2007
Annotation: This dissertation addresses fundamental bottleneck of end-to-end (EtE) connection interruption (CI) between the sender and receiving mobile host (MH), during the reallocating process of mobile nodes (MNs) between subnets, in causing the problem of packet losses (PLs), probably for a dozen packets. Key contributions in this dissertation involve an efficient triangle of PLs interpretation during RP, around which a workaround is developed, mapping the MIP-RP to roaming behaviour. This procedure is based on a Triple-R sequence (RRR: requesting, registering, and then roaming) that supposes an early registration of the MN to a subnet predicted to roam into, using a HA-based registration and a prototyped EqR-policy (equilibrium roaming-policy), with proper settings of mobility binding cache table (MBCT). System model and associated modelling assumptions are employed, and corresponding Petri-Nets of state-transitions diagram are structured. The complex multidimensional Markov chain of corresponding CIA Petri-Nets is analyzed, around the equilibrium point, for system EtE packet delay (EtE-D). Performance simulation results of Simulink Matlab of the developed MIP-CIA, within each subnet and also between subnets, compared with traditional MIP one.

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: tiber.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, SYNOPSIS) 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 – project, 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. The 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 on distributed processing and parallel programming graduate modules and an 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 interconnection, front-end server with UPS and Globus Toolkit software. Grid system 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, M. Kotočová, T. Krajčovič, K. Jelemenská, J. Hudec, E. Tomalová, J. Hasan, P. Čičák, B. Dado, D. Kotmanová, D. Bernát, D. Malina, A. Bagala, J. Flochová, M. Zimen, T. Török

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)

<i>Project leader:</i>	P. Čičák
<i>Members:</i>	D. Bernát, B. Dado, K. Jelemenská, M. Kotočová
<i>Supported by:</i>	Hewlett Packard
<i>Duration:</i>	September 2007 – August 2009
<i>Description:</i>	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.

8.6 Publications

Journals

KINDER, R., HUDEC, L., CHMEL, T., HULÉNYI, L., KURUC, M.: An Automatic Measurement System with Spreading Resistance and PCIV Profiling for Characterization of Semiconductors. In: *Journal of Electrical Engineering*. ISSN 1335-3632. Vol. 58, No. 3, 2007, pp. 165-168.

International Conferences

CSÓKÁS, E., ČIČÁK, P.: Process visualization system design based on co-design methodology. In: *ICETA 2007*, 5th Int. Conf. on Emerging e-Learning Technologies and Applications. Stará Lesná, Slovak Republic, 2007. pp. 121-125.

FLOCHOVÁ, J., MRAFKO, L., MUDRONČÍK, D., AUXT, F.: On Industrial Techniques and Information Technology Control Classrooms. In: *46th IEEE Conf. on Decision and Control*, New Orleans, LA, USA, 2007. pp. 1874-1879.

FLOCHOVÁ, J., BOEL, R., JIROVEANU, G.: On Probabilistic Diagnosis for Free-Choice Petri Nets. In: *2007 American Control Conference*, New York, USA, 2007: Book of Abstracts. New York: American Automatic Control Council, pp. 5655-5656.

GRELLNETH, I., KVASNIČKA, M.: Methodical Instrument for the Study and Proper Analysis of Distributed algorithms of IEEE 802.1D and IEEE 802.1W Standards. In: *ICETA 2007*, 5th Int. Conf. on Emerging e-Learning Technologies and Applications. Stará Lesná, Slovak Republic, 2007. pp. 131-135.

KRAJČOVIČ, T.: Support Tools for Embedded Systems. In: *Applied Electronics 2007*, Int. Conf. Pilsen, Czech Republic, 2007. pp. 113-116.

Local and National Conferences

CSÓKÁS, E., ČIČÁK, P.: Rule based Software Generator for Co-design. In: *Informatics 2007*, Proc. of the 9th Int. Conf. on Informatics. Bratislava, Slovakia, pp. 49-53.

- HASAN, J.: An "Ecosystem" of Healthy Grid Maintenance. In: *Informatics 2007*, Proc. of the 9th Int. Conf. on Informatics. Bratislava, Slovakia, pp. 211-215.
- KOTMANOVÁ, D.: Digital Design Verification using Model-Checking. In: *Informatics 2007*, Proc. of the 9th Int. Conf. on Informatics. Bratislava, Slovakia, pp. 54-61.
- MOSTAFA, H.: Hands for a Mobile-IP Extension: C. I. A. Petri-Nets Modelling and Simulations on Cisco Wireless Routers. In: *Student Research Conference 2007*. 3rd Student Research Conference in Informatics and Information Technologies Bratislava, Supervisor: P. Čičák, 2007. pp. 348-355.
- STRHAN, M., GRELLNETH, I.: Principles and Visualization of STP. In: *Informatics 2007*, Proc. of the 9th Int. Conf. on Informatics. Bratislava, Slovakia, pp. 81-88.
- ŠTRBA, A., KRAJČOVIČ, T.: Embedded Systems with Limited Power Source. In: *Informatics 2007*, Proc. of the 9th Int. Conf. on Informatics. Bratislava, Slovakia, pp. 41-48.

Parts of Books

- FLOCHOVÁ, J., GALBAVÝ, M.: Database Technology and Industrial Transaction Techniques in Control Education. In: *Selected Topics in Modelling and Control Vol. 5*. STU in Bratislava, 2007. pp. 63-68.

Textbooks

- FLOCHOVÁ, J., KRÁLOVÁ, Z.: Database Systems. Bratislava, Slovak University of Technology, 2007. 75 pp. (in Slovak)

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
- 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

- *L. Hudec*: COST meeting, Strasbourg, France, March 20-22, 2007
- *P. Čičák, K. Jelemenská, D. Malina*: Cisco Network Academy Conference, Prague, Czech Republic, April 12-14, 2007
- *J. Flochová*: University of Ghent, Belgium, April 17-24, 2007
- *K. Jelemenská*: ISEP Paris, France, June 18-22, 2007
- *L. Hudec*: COST meeting, Stockholm, Sweden, June 19-22, 2007
- *I. Grellneth*: Cisco Academy Training Center, Budapest, Hungary, July 9-27, 2007
- *J. Flochová*: 2007 American Control Conference, New York, USA, July 11-17, 2007
- *T. Krajčovič*: Applied Electronic 2007, Pilsen, Czech Republic, September 4-9, 2007

- *B. Hružík*: Czech Technical University, Prague, September 5-7, 2007
- *P. Čičák*: E & EM Academy Conference 2007, Istanbul, Turkey, October 5–9, 2007
- *P. Čičák*: HP Technology for Teaching Forum, London, United Kingdom, October 9-12, 2007
- *M. Kolesár*: University of West Bohemia in Pilsen, Czech Republic, October 24, 2007
- *P. Čičák, M. Kolesár*: CSEW 2007, Peršlák, Czech Republic, October 25-26, 2007
- *M. Zimen*: MEMICS 2007, Znojmo, Czech Republic, October 26-28, 2007

8.8 Membership in Professional Organisations and Societies

Slovak Professional Organisations and Societies

Pavel Čičák

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

Jamal Hasan

- Slovak Nuclear Society, (member, since 2003)

Ladislav Hudec

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

Milan Kolesár

- Slovak Centre of the IEE (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)
- International Journal of Information Technology IJIT, World Enformatika – Hossam el-ddin M. Hussin: member of editorial board
- International Journal of Information Technology IJCS, World Enformatika – Hossam el-ddin M. Hussin: member of editorial board
- International Conference on Information Technology ICIT, World Enformatika Society - Hossam el-ddin M. Hussin: member of programme committee
- International Conference on Computer Science ICCS, World Enformatika Society – Hossam el-ddin M. Hussin: member of programme committee
- International Conference on Communication Technology ICCT, World Enformatika Society – Hossam el-ddin M. Hussin: member of programme committee
- Spektrum, University News Periodical – M. Kolesár: member of the editorial board (since 2003)
- Newsletter of Cisco Networking academy in Slovakia – P. Čičák, P. Mesjar: members of editorial board
- ICETA 2007 – 5th International Conference on Emerging E-Learning Technologies and Applications, September 6-8, 2007, Stará Lesná, High Tatras, Slovakia – P. Čičák: member of programme committee

9 Institute of Informatics and Software Engineering

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

Lucia Galbavá

Marta Gnipová (part time)

Daniela Gregušová, Assoc. Professor (part time)

Nikoleta Habudová

Eubica Hanulová (part time)

Daniela Chudá, PhD.

Ivan Kapustík

Dagmar Komorová (part time)

Gabriela Kosková, PhD.

Jana Minárová, Assoc. Professor (part time)

Marián Mlynarovič, PhD. (part time)

Vladimír Mlynarovič, Assoc. Professor (part time)
Ľudovít Molnár, Professor
Pavol Návrat, Professor
Jozef Papula, Professor (part time)
Ivan Polášek, PhD. (part time)
Ivan Polický
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 Teachers

Imrich Lenharčík
Martin Marko
Danica Šoltésová, PhD.

PhD Students:

Anton Andrejko
Michal Barla
Peter Bartalos
György Frivolt
Jozef Hamar
Jaroslav Jakubík
Martin Kiselkov
Matej Košík
Ľubomír Majtás
Ján Máté
Jakub Mažgut
Ján Suchal
Martin Šechný
Jozef Tvarožek
Michal Tvarožek
Peter Vojtek

9.2 Teaching

Undergraduate Study (Bc.)

Course	Semester	Credits	Lecturer
Artificial Intelligence	Spring	6	P. Návrát
Communication in Culture History	Spring	3	D. Šoltésová
Construction of Effective Algorithms	Spring	6	M. Winczer
Data Structures and Algorithms	Autumn	6	P. Návrát
Entrepreneurship and Management	Autumn	5	J. Papula
Final Bachelor Project I-II	Autumn Spring	3-9	P. Návrát
Functional and Logic Programming	Autumn	6	M. Bieliková
Information and Communication Technologies Law	Spring	5	D. Gregušová
Managerial Economics	Autumn	5	V. Mlynarovič
Object-Oriented Programming	Spring	6	V. Vranić
Program Development for Java 2 Platform	Spring	6	M. Marko
Programming Languages and Compilation	Autumn	6	E. Molnár
Principles of Information Systems	Autumn	5	V. Rozinajová
Principles of Software Engineering	Spring	7	M. Bieliková
Procedural Programming	Autumn	6	A. Bou Ezzeddine
Specifications Methods and Tools	Spring	6	E. Molnár
Software Systems Development	Spring	3	M. Bieliková
Theoretical Foundations of Informatics	Spring	6	D. Chudá

Master Study (Ing.)

Course	Semester	Credits	Lecturer
Architecture of Information Systems	Autumn	4	M. Mlynarovič
Architecture of Software Systems	Autumn	4	P. Návrát
Architecture and Design Patterns for Program Information Systems	Spring	5	E. Šešera
Aspect-Oriented Software Development	Autumn	5	V. Vranić
Design of Compilers	Autumn	6	E. Molnár
Diploma Project I–III (Information Systems)	Autumn Spring	4-10-21	P. Návrát
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

Course	Semester	Credits	Lecturer
Industry Project	Spring	5	M. Bieliková
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	I. Lenharčík
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

- Adamec, Tomáš: *Voice over IP*. May 2007. Supervisor: M. Lekavý
- Baran, Milan: *Course forum*. May 2007. Supervisor: L. Hanulová
- Barlík, Rastislav: *Simulator of non-deterministic computing machines*. May 2007. Supervisor: I. Polický
- Bartošek, Martin: *Personal data protection in information systems*. May 2007. Supervisor: L. Galbavá
- Benický, Peter: *Course forum*. May 2007. Supervisor: L. Hanulová
- Biró, Ladislav: *E-Commerce as a new form of communication*. May 2007. Supervisor: L. Galbavá
- Borženský, Ladislav: *Electronic document management*. May 2007. Supervisor: I. Polášek
- Brtáň, Peter: *Development using model driven architecture*. May 2007. Supervisor: L. Majtás
- Bystričan, Marián: *Mobile solutions in information systems*. May 2007. Supervisor: I. Polášek
- Bálík, Jaroslav: *Implementation of J2EE and Java GoF patterns*. May 2007. Supervisor: I. Polášek
- Chabadová, Martina: *Communication algorithm analysis on regular and unreliable networks*. May 2007. Supervisor: M. Nehéz
- Coranič, Matúš: *Clustering data mining*. May 2007. Supervisor: A. Bou Ezzeddine
- Cích, Peter: *Support of painted puzzles*. May 2007. Supervisor: L. Hanulová

- Dedáček, Dalibor: *The Internet as basic medium of electronic communication*. May 2007. Supervisor: L. Galbavá
- Demková, Alexandra: *Mobile solutions in IS*. May 2007. Supervisor: I. Polášek
- Divéky, Marko: *Support of education by using modern technologies*. May 2007. Supervisor: M. Bieliková
- Ďurech, Juraj: *Drawing large graphs via a client-server interface*. May 2007. Supervisor: G. Frivolt
- Fabián, Miroslav: *Design and implementation of a friend-suggesting system for social portals*. May 2007. Supervisor: G. Frivolt
- Fábik, Pavol: *Visualization of the process of creating and using ADT in software*. May 2007. Supervisor: J. Minárová
- Gablovský, Marian: *Distributed management of commerce with help of mobile agents*. May 2007. Supervisor: I. Kapustík
- Garaj, Ján: *Optimization of the usage of computer systems in e-mail*. May 2007. Supervisor: J. Máté
- Hajdu, Ladislav: *Web-application for teaching the databases on high school*. May 2007. Supervisor: M. Šechný
- Hergott, Jozef: *Portal for single document management*. May 2007. Supervisor: I. Kapustík
- Hirjak, Miroslav: *Design of the selected part of the university information system*. May 2007. Supervisor: V. Rozinajová
- Hluchý, Pavol: *Acquisition and sharing of the information about conferences in Web*. May 2007. Supervisor: M. Bieliková
- Hopko, Jozef: *Device driver for MINIX3*. May 2007. Supervisor: M. Košík
- Janov, Vladimír: *Internet as a basic mean of electronic communication*. May 2007. Supervisor: L. Galbavá
- Jastrzemska, Lucia: *Model of search for information inspired by social insects*. May 2007. Supervisor: P. Návrat
- Jelínek, Tomáš: *Model of the search for information inspired by social insects*. May 2007. Supervisor: P. Návrat
- Jónás, Márk: *Application programming equipment for management support of software companies*. December 2007. Supervisor: P. Morávek
- Jurnečka, Peter: *Support of education with use of modern technologies*. May 2007. Supervisor: M. Bieliková
- Jurík, Miroslav: *Object-relational mapping*. May 2007. Supervisor: M. Holečka
- Kajan, Rudolf: *Support of education with use of modern technologies*. May 2007. Supervisor: M. Bieliková
- Kajsa, Peter: *CASE tools support for design pattern*. May 2007. Supervisor: J. Jakubík
- Kasan, Michal: *Architectonic design patterns*. May 2007. Supervisor: J. Jakubík

- Katona, Aleš: *Cross-platform networking library - LNET*. May 2007. Supervisor: M. Kiselkov
- Kilík, Matej: *Minix3 device driver*. May 2007. Supervisor: M. Košík
- Kiselkov, Sašo: *The Andrea UI system*. May 2007. Supervisor: M. Kiselkov
- Kohut, Ján: *Using dependency injection pattern in applications*. May 2007. Supervisor: L. Majtás
- Kolesár, Ján: *Attackers decision making*. May 2007. Supervisor: I. Kapustík
- Koperdák, Marek: *Analysis of knowledge management and implementation of knowledge management in software engineering*. May 2007. Supervisor: I. Polášek
- Korman, Matúš: *Linux kernel level remote restart*. May 2007. Supervisor: J. Máté
- Kosorín, Michal: *Support of software development with CASE tool*. May 2007. Supervisor: V. Rozinajová
- Kostková, Katarína: *Computer program - author's work*. May 2007. Supervisor: L. Galbavá
- Kotúč, Ján: *Aspect-oriented design patterns*. May 2007. Supervisor: V. Vranić
- Koutný, Dušan: *Analysis and design of workflow for virtual company*. May 2007. Supervisor: I. Polášek
- Kováč, Tomáš: *Augmentation of client application for map servers on PDA*. May 2007. Supervisor: I. Kapustík
- Kováčová, Bianka: *Implementation of J2EE and Java GOF patterns*. May 2007. Supervisor: I. Polášek
- Kozmon, Martin: *Image processing*. May 2007. Supervisor: A. Považanová
- Koščák, Michal: *Abstract data types*. May 2007. Supervisor: A. Považanová
- Kvetan, Michal: *Image processing*. May 2007. Supervisor: A. Považanová
- Kysel, Dušan: *Implementation of Java EE and GOF design patterns in Java*. May 2007. Supervisor: I. Polášek
- Labaš, Matej: *Standards and recommendations for the creation of websites*. May 2007. Supervisor: M. Šechný
- Labuda, Tomáš: *Modelling deployment environment using UML 2.0*. May 2007. Supervisor: I. Polášek
- Laššů, Miroslav: *Role-playing game*. May 2007. Supervisor: A. Považanová
- Liška, Lukáš: *Distributed shared calendar*. May 2007. Supervisor: V. Grlický
- Majan, Marian: *Remote restart of Linux operating system at kernel layer*. May 2007. Supervisor: J. Máté
- Majerčík, Maroš: *Gridders support*. May 2007. Supervisor: L. Hanulová
- Mako, Vladimír: *Authorization of electronic documents*. May 2007. Supervisor: I. Polášek
- Menkyna, Radoslav: *Aspect-oriented design patterns*. May 2007. Supervisor: V. Vranić

- Michalco, Pavol: *Distributed shared calendar*. May 2007. Supervisor: V. Grlický
- Michálek, Martin: *Data mining using clustering methods*. May 2007. Supervisor: A. Bou Ezzeddine
- Nemčík, Lukáš: *Adventure game*. May 2007. Supervisor: A. Považanová
- Nepšinský, Martin: *Development using model driven architecture*. May 2007. Supervisor: Ľ. Majtás
- Oláh, Michal: *Synchronizing project with CASE system*. May 2007. Supervisor: I. Polášek
- Omelina, Ľuboš: *Support of education with use of modern technologies*. May 2007. Supervisor: M. Bieliková
- Orgonáš, Jozef: *Expansion and implementation of user interface of application Putty for architecture Symbian UIQ 3*. May 2007. Supervisor: J. Máté
- Ország, Miloš: *Usage of dependency injection pattern in application development*. May 2007. Supervisor: Ľ. Majtás
- Oršula, Radoslav: *Design and implementation of a method of connecting social portal networks*. May 2007. Supervisor: G. Frivolt
- Paroulek, Pavel: *Generation of networks similar to Internet*. May 2007. Supervisor: M. Nehéz
- Porubčan, Zdenko: *Simulator of non-deterministic computing machines*. May 2007. Supervisor: I. Polický
- Potančok, Ivan: *Standard and recommendation adherence in web page development*. May 2007. Supervisor: M. Šechný
- Rada, Peter: *Support development software by means of CASE*. May 2007. Supervisor: V. Rozinajová
- Repaský, Miroslav: *Clustering algorithms in R*. May 2007. Supervisor: G. Kosková
- Romanová, Miroslava: *Electronic commerce as new form of communication*. May 2007. Supervisor: L. Galbavá
- Sarlós, Tomáš: *Architectural patterns in software systems*. May 2007. Supervisor: J. Jakubík
- Schvartz, Tibor: *Assistance in teaching Java language with help of examples*. May 2007. Supervisor: A. Bou Ezzeddine
- Sedlák, Pavol: *Software development using POAD*. May 2007. Supervisor: J. Jakubík
- Sim, Lukáš: *Analysis of computer user behaviour using input devices*. May 2007. Supervisor: J. Máté
- Slobodník, Miroslav: *Extension of successful systems to new forms of communication*. May 2007. Supervisor: R. Filkorn
- Slížik, Lukáš: *Visualisation of process of creating and using ADT in software applications*. May 2007. Supervisor: J. Minárová

- Stoklasa, Radim: *Acquiring deep information using visual system*. May 2007. Supervisor: D. Janglová
- Šillík, Milan: *Abstract Java types*. May 2007. Supervisor: A. Považanová
- Šimko, Alexander: *Random access machine with stored program simulator*. May 2007. Supervisor: I. Polický
- Šimon, Juraj: *A system to support e-learning*. May 2007. Supervisor: V. Šimáková
- Šiška, Peter: *Web browser*. May 2007. Supervisor: G. Kosková
- Škuba, Andrej: *Visualisation of object attributes in maps*. May 2007. Supervisor: M. Kováčik
- Štolc, Miroslav: *Processing biometric data*. May 2007. Supervisor: I. Polášek
- Tešlár, Jaroslav: *The alternatives of interactive connection of information in factographic information systems with cartographic interface*. May 2007. Supervisor: N. Andrejčíková
- Vaclavik, Jozef: *Cluster solution on computers with OS Linux*. May 2007. Supervisor: M. Šechný
- Zelinka, Ľuboš: *Syntax analysis visualization of context-free languages generated by LL and LR grammars*. May 2007. Supervisor: I. Polický
- Zeman, Jozef: *Possibilities of interactive interconnection of information in factographic information systems with cartographic interface*. May 2007. Supervisor: N. Andrejčíková

Master (Ing.) Theses

- Adam, Martin: *Annotation of accessed web pages during accessing*. May 2007. Supervisor: P. Návrat
- Balko, Imrich: *Application of OCL in UML profiles*. May 2007. Supervisor: M. Líška
- Bebjak, Michal: *Aspect-oriented change implementation in Web applications*. December 2007. Supervisor: V. Vranić
- Braun, Marek: *Design of an information system development methodology*. December 2007. Supervisor: V. Rozinajová
- Červeň, Slavomír: *Possibility of mobile agents security*. May 2007. Supervisor: I. Kapustík
- Chalány, Martin: *Electronic chronicle of FIIT*. May 2007. Supervisor: V. Šimáková
- Dačo, Rudolf: *Resources of mobile agents defence*. May 2007. Supervisor: I. Kapustík
- Fazekas, Ľuboš: *Refactoring of object structures*. May 2007. Supervisor: I. Polášek
- Hluchý, Ondrej: *Information searching and presentation on the Web*. May 2007. Supervisor: V. Rozinajová

- Jánoš, Igor: *Digital TV stream production*. December 2007.
Supervisor: A. Považanová
- Klempa, Tomáš: *Maintenance of the user model in adaptive web-based systems*.
May 2007. Supervisor: A. Andrejko
- Kotrba, Attila: *Design patterns in software development*. May 2007.
Supervisor: J. Minárová
- Kuzár, Tomáš: *Web users information gathering*. December 2007.
Supervisor: A. Bou Ezzeddine
- Lokša, Michal: *Support of the education MaPŠ - verification*. May 2007.
Supervisor: D. Komorová
- Minárik, Matej: *Classification of textual documents*. May 2007.
Supervisor: A. Bou Ezzeddine
- Májek, Ján: *Administration and publication of the documents in the Semantic Web environment*. May 2007. Supervisor: L. Hanulová
- Pálka, Marek: *Source code generation from UML 2.0 dynamic diagrams*.
December 2007. Supervisor: I. Polášek
- Pulai, Zoltán: *System analysis and design using MDA*. December 2007.
Supervisor: J. Mikolaj
- Slezák, Jozef: *Design pattern recognition and recovery*. December 2007.
Supervisor: R. Filkorn
- Šimno, Peter: *Semantic web browser*. December 2007. Supervisor: P. Návrat
- Šimon, Lukáš: *Application support for software development projects*.
December 2007. Supervisor: J. Masaryk
- Šimún, Michal: *Personalized approach to user in e-learning environment*.
December 2007. Supervisor: A. Andrejko
- Taraba, Tomáš: *Context search*. December 2007. Supervisor: P. Návrat
- Vanderka, Tomáš: *Overcoming differences among aspect-oriented languages using MDA*.
May 2007. Supervisor: V. Vranić
- Vaňo, Jakub: *Collaborative editing of source code in team*. December 2007.
Supervisor: V. Šimáková
- Žitňanský, Michal: *Family tree*. December 2007. Supervisor: A. Považanová

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 focus on multi-agent systems and their collaboration, as well as intelli-

gent 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

Research and Development of a Knowledge-Based System to Support Workflow Management in Organizations with Administrative Workflow Processes (APVT-51-024604)

Project leader: P. Návrát

Contractor: Institute of Informatics, Slovak Academy of Sciences

Partners: UI SAV Bratislava, VA Liptovský Mikuláš

Members: M. Bieliková, A. Bou Ezzeddine, R. Filkorn, I. Kapustík, M. Lekavý, E. Majtás, E. Molnár, V. Rozinajová, V. Vranič

Supported by: Slovak Research and Development Agency

Duration: January 2005 – December 2007

Description: The project is aimed at creation of the knowledge-based system for workflow support with administrative focus based on multi-agent technologies with the application of the ontological approach to modelling and capturing knowledge for their reuse in workflow control. The objective is a thorough analysis of knowledge in organisations, creating a knowledge model skeleton and design of methods for capturing, storing and creating knowledge. Development of methods for creating new knowledge is based on algorithms for reasoning on captured knowledge. In the area of reasoning according to existing cases, a methodology for development of a library of cases for administrative processes has to be created.

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. Návrat, 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...) 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, T. Chvostek, I. Kapustík, M. Kněžek, P. Návrat, M. Tomša
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, I. Kapustík, G. Kosková, I. Polášek, I. Polický, V. Rozinajová, V. Vranić, 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, Organisation, and Maintenance of Knowledge in an Environment of Heterogeneous Information Resources (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 subject of the project is the basic and applied research aimed at the work with knowledge in an environment of heterogeneous information resources. Internet and its services serve as an appropriate environment for the research of new approaches to acquisition, organisation, verification, evaluation, and maintenance of knowledge timeliness. Experiments will be performed also in an intranet environment. The objective is to explore the models needed to work with knowledge – the information content model, the user and context model – and to explore knowledge discovery methods with the use of ontologies. The project results are twofold: the main part represents the basic research results in the domain of knowledge life cycle support in an environment of heterogeneous resources, while the other is the result application in the development of tools and pilot systems aimed at work with knowledge.

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. Vranić
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.

Support of Young Research Workers Education with the Aim to Bring up Inventive Experts – Informatics Professionals – for Modern Society Based on Knowledge (JPD 3 2004/1-022, project code 13120200021)

- Project leader:* M. Bieliková
Members: Ľ. Molnár, P. Návrat, M. Šperka
Supported by: European Social Fund
Duration: December 2004 – June 2007
Description: The project is oriented towards a support of education of young researchers – PhD students. The value is in creating study materials for new PhD degree programs realized at the Faculty of Informatics and Information Technologies, especially in software engineering. The project also affords facilities for financial support of PhD students in order to increase the number of young research workers with highest qualification.

European Thematic Network for Doctoral Education in Computing (ERASMUS 3 - Thematic Networks, project code 114046-CP-1-2004-1-BG-ERASMUS-TN)

- Project leader:* P. Návrat for STU
Contractor: A. Smrikarov, Angel Kunchev University of Rousse, Bulgaria
Supported by: Socrates programme of the European Commission
Countries: AT, BE, CZ, CY, DK, DE, EE, FI, GR, ES, FR, HU, IE, IS, IT, LU, LV, LT, MT, NL, NO, PL, PT, RO, SE, UK
Duration: October 2004 – September 2007
Description: The general objectives of the network are to establish the principles of effective, high quality, Europe-valid doctoral studies and develop the tools for doing this through analysing the existing systems, exchanging experiences and disseminating good practices among all partners. Using the most up-to-date information and communication technologies, and the experience gained from the Virtual European Department of Computing (VEDoC), to help acknowledge doctoral studies as an important "third" cycle of education aiming at the achievement of a European Dimension in Higher Computing Education and Training.

The main project activities are: creating a European Thematic Network Doctoral Education in Computing (ETN DEC); developing the "third" cycle of education – the doctoral degree in Computing; developing a Quality Assurance System in Doctoral Education; evaluating and disseminating project results.

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 will address: - 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
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.

9.6 Publications

Journals

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- BARTALOS, P., BIELIKOVÁ, M.: An Approach to Object-ontology Mapping. In: *Software Engineering in Progress, CET-SET 2007*, Poznan, Poland, 2007. pp. 67-79.

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Books

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BIELIKOVÁ, M., MANNOVÁ, B., ŠALOUN, P. (Eds.): *Technologies for e-learning 2007*. Proceedings. Prague, Czech Republic, 2007. 87 p.

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Parts of books

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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
- INRIA, Grenoble, France
- University of Maribor, Slovenia
- Aristotle University, Thessaloniki, 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
- LaBRI, University of Bordeaux 1, France

Visits of Staff Members

- *V. Rozinajová*: Katholieke Hogeschool Leuven, Belgium, January 11-14, 2007
- *M. Bieliková, P. Bartalos, L. Majtás, M. Tvarožek*: SOFSEM 2007, Harachov, Czech Republic, January 20-25, 2007
- *M. Barla*: Tiroler Bildungsinstitut – Grillhof, Innsbruck, Austria, January 21-26, 2007
- *P. Návrat*: Technical University Brno, Czech Republic, January 31, 2007
- *M. Bieliková*: Technical University Brno, Czech Republic, January 31, 2007
- *G. Kosková*: Universität fuer Bodenkultur, Wien, February 15, 2007
- *P. Návrat, M. Bieliková, A. Bou Ezzeddine, D. Chudá, A. Andrejko, G. Frivolt*: Knowledge 2007, Ostrava, Czech Republic, February 21-23, 2007
- *P. Návrat*: INQAAHE, Toronto, Canada, April 1–6, 2007
- *L. Molnár*: UNESCO, Paris, France, March 14-20, 2007
- *M. Barla*: ISIM 2007, Hradec nad Moravicí, Czech Republic, April 23-25, 2007
- *M. Bieliková, O. Vozár, M. Tomša, A. Frlička, R. Veselý, R. Kajan, M. Divéky, P. Jurnečka, L. Omelina*: Imagine Cup, Czech Republic, May 3-5, 2007
- *M. Bieliková, P. Návrat*: WWW 2007 Congress, Banff, Canada, May 6-14, 2007
- *P. Návrat*: Accreditation Committee, St. Petersburg, Russia, May 24–26, 2007

- *M. Bieliková*: Technical University Brno, Czech Republic, May 25, 2007
- *M. Lekavý*: KES AMSTA 2007, Wroclaw, Poland, May 30 - June 3, 2007
- *D. Chudá*: CompSysTech2007, Rousse, Bulgaria, June 13-17, 2007
- *M. Bieliková*: Technologies for e-learning, Prague, Czech Republic, June 15-16, 2007
- *M. Bieliková, P. Návrat*: Technical University Brno, Czech Republic, June 19, 2007
- *M. Barla*: UM 2007, Corfu, Greece, June 24–July 1, 2007
- *M. Bieliková, M. Barla, P. Bartalos, V. Vranić*: ICWE 2007, Como, Italy, July 17-21, 2007
- *M. Bieliková, R. Kajan, M. Divéky, P. Jurnečka, L. Omelina*: Imagine Cup 2007 Worldwide Finals, Seoul, South Korea, August 4-12, 2007
- *D. Chudá, P. Návrat*: ETN DEC meeting, Istanbul, Turkey, August 26–31, 2007
- *M. Tvarožek*, Reasoning Web Summer School, Dresden, Germany, September 2-9, 2007
- *M. Bieliková*: Hypertext 2007, Manchester, United Kingdom, September 9-14, 2007
- *M. Tvarožek*: ECDL 2007, Budapest, Hungary, September 16-20, 2007
- *P. Návrat*: 9th ENQA General Assembly, Oslo, Norway, September 17-21, 2007
- *P. Návrat*: ADBIS program committee, Sofia, Bulgaria, September 29–October 1, 2007
- *L. Molnár*: E & EM Academy Conference 2007, Istanbul, Turkey, October 5–9, 2007
- *P. Bartalos, M. Lekavý, L. Majtás*: CEE – SET 2007, Poznań, Poland, October 9– 13, 2007
- *M. Bieliková*: Datakon 2007, Brno, Czech Republic, October 20-23, 2007
- *M. Bieliková, P. Návrat*: CSEW 2007, Peršlák, Czech Republic, October 25–26, 2007
- *L. Molnár*: UNESCO, Paris, France, October 25 - November 10, 2007
- *P. Návrat, T. Taraba, L. Jastrzemska, T. Jelínek*: 2007 IEEE/WIC/ACM Conference, October 29– November 6, 2007
- *M. Bieliková*: ACM SRC 2007, Prague, Czech Republic, November 8-10, 2007
- *T. Chvostek*: MATLAB 2007, Prague, Czech Republic, November 13-15, 2007
- *M. Bieliková, P. Návrat*: Technical University, Brno, Czech Republic, November 21, 2007
- *M. Bieliková*: Czech Technical University, Prague, December 7-8, 2007
- *P. Návrat*: ECA 2007 Dissemination Conference, Barcelona, Spain, December 9-11, 2007
- *M. Bieliková*: SMAP 2007, London, United Kingdom, December 16-19, 2007

Visitors to the Institute

- *M. Goebel*: Vienna University of Technology, Vienna. Austria, February 8, 2007

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 Bielíková

- 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)

György Frivolt

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

Matej Košík

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

Marián Lekavý

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

Eudovít 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, since 2002)
- 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 Vranić

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

International Professional Organisations and Societies*Mária Bieliková*

- 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)
- 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)
- IFIP, International Federation for Data Processing (member of Technical Committee TC2 – Software: Theory and Practice, since 1995)
- 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 2007 – Slovak University of Technology Contest – I. Polický: event organiser
<http://www.fiit.stuba.sk/acm/>
- ACM CZ Student Research Competition 2007, Prague, Czech Republic – participation of 1 student project (M. Bielíková: supervisor), finals, Prague, Czech republic (1st place)
- ProFIIT 2007 – Programming Competition for Secondary School Students – L. Galbavá: event organiser
<http://www.fiit.stuba.sk/ProFIIT/>
- RoboCup, Soccer Simulation League, Regional Tournament in Bratislava, May 24-25, 2007 – I. Kapustík: event director, M. Lekavý: event organiser
<http://www.fiit.stuba.sk/robocup/>
- Imagine Cup 2007 – 1st and 2nd place in the regional student team contest, May 4, 2007, Prague, Czech Republic (M. Bielíková, supervisor)
- Imagine Cup 2007 – participation of the best regional student team in the world cup, August 5-11, 2007, Seoul, South Korea (M. Bielíková, supervisor)
- IIT.SRC 2007 – Informatics and Information Technologies Student Research Conference, April 18, 2007 – V. Šimáková: organising committee chair, M. Bielíková: programme committee chair
<http://www.fiit.stuba.sk/iit-src/>
- Computing and Informatics (CAI) – P. Návrat: member of the editorial board
- International Journal of Intelligent Information and Database Systems – M. Bielíková: member of the editorial board
- VEGA, Scientific Grant Agency of the Ministry of Education of Slovak Republic and the Slovak Academy of Sciences – M. Bielíková, P. Návrat: members of technical committee

- ACM CZ Student Research Competition 2007 – M. Bieliková: member of steering committee
- Personalized Web (PeWe) Group seminar organization
<http://www.fiit.stuba.sk/research/pewe>
- (Co)-organizing conferences ITAT 2007, WIKT 2007, TPEV 2007, Znalosti 2007
- INFORMATICS 2007, Bratislava – Ľ. Molnár: co-chair of programme committee
- ISIM 2007 – 9th Int. Conf. on Information Systems Implementation and Modeling, April 23–25, 2006, Hradec nad Moravicí, Czech Republic – M. Bieliková, P. Návrat: members of programme committee
- ZNALOSTI 2007, February 21–23, 2007, Ostrava, Czech Republic – M. Bieliková, P. Návrat: members of programme committee, P. Návrat: member of steering committee
- IADIS International Conference (MCCIS-ISA 2007) – Intelligent Systems and Agents, July 3–5, 2007, Lisbon, Portugal – M. Bieliková: member of programme committee
- ECDL 2007 – 10th European Conference on Research and Advanced Technology for Digital Libraries, September 16–21, 2007, Budapest, Hungary – M. Bieliková: member of programme committee
- RAAWS 2007 – Recommender Agents and Adaptive Web-based Systems, invited session at the 11th International Conference on Knowledge-Based & Intelligent Information & Engineering Systems, KES 2007, September 12–14, 2007, Vietri sul Mare, Italy – M. Bieliková: member of programme committee
- ITAT 2007 – Conference on Information Intelligent Technologies – Applications and Theory. September 21–27, 2007. Poľana, Slovakia – M. Bieliková, P. Návrat: members of programme committee
- DATAKON 2007 – Annual Conference on the Current Trends in Databases and Information Systems, October 20–23, 2007, Brno, Czech Republic – M. Bieliková: member of steering committee, member of programme committee
- TPEV 2007 – Technologies for E-Learning 2006, June 15, 2007, Prague, Czech Republic – M. Bieliková: member of programme committee, member of organising committee
- SCO 2007 – 4th International Conference on Sharable Content Objects, May 30–31, 2007, Brno, Czech Republic – M. Bieliková: member of programme committee
- WIKT 2007 – 2nd Workshop on Intelligent and Knowledge oriented Technologies, November 15–16, Košice, Slovakia – M. Bieliková, P. Návrat: members of programme committee
- KES-AMSTA 2007 – 1st KES Symposium on Agent and Multi-Agent Systems – Technologies and Applications, May 31 – June 1, 2007, Wroclaw, Poland – M. Bieliková: member of programme committee
- EJC 2007 – 17th European Japanese Conference on Information Modelling and Knowledge Bases, June 4-8, 2007, Pori, Finland – M. Bieliková: member of programme committee

- ICETA 2007 – 5th International Conference on Emerging E-Learning Technologies and Applications, September 6-8, 2007, Stará Lesná, High Tatras, Slovakia – L. Molnár, P. Návrat, members of honorary committee, M. Bieliková: member of programme committee
- ADML@EC-TEL 2007 International Workshop on Applying Data Mining in e-Learning, September 17-20, Crete, Greece – M. Bieliková: member of programme committee
- IDC 2007 – International Symposium on Intelligent and Distributed Computing, October 18–20, Craiova, Romania – P. Návrat: member of programme committee
- ETID 2007 – 1st International Workshop on Evolutionary Techniques in Data-Processing, held in collocation with DEXA 2007, September 3–7, 2007, Regensburg, Germany – P. Návrat: member of programme committee
- CompSysTech 2007 – International Conference on Computer Systems and Technologies 2007, June 14-15, Rousse, Bulgaria – P. Návrat: member of programme committee
- CEE-SET 2007 – 2nd IFIP Central and East European Conference on Software Engineering Techniques, October 10-12, 2007, Poznan, Poland – M. Bieliková, P. Návrat, members of programme committee
- SOFSEM 2007 – Annual Conference on Current Trends in Theory and Practice of Informatics, January 20-26, Meřín, Czech Republic – M. Bieliková: Chair of Student Research Forum
- ICWE 2007 – International Conference on Web Engineering, July 16-20, Como, Italy – M. Bieliková: member of programme committee
- EDM@ICALT 2007 – International Workshop on Educational Data Mining, as part of the 7th IEEE International Conference on Advanced Learning Technologies (IEEE ICALT 2007), July 18-20, Niigata, Japan – M. Bieliková: member of programme committee
- SMAP 2007 – 2nd International Workshop on Semantic Media Adaptation and Personalization, December 17-18, London, United Kingdom – M. Bieliková: member of programme committee

10 Regional Networking Academy

E-mail: info@cisco.fiit.stuba.sk
Web: www.cisco.fiit.stuba.sk
Tel: + 421 2 602 91 689
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

Katarína Jelemenská, PhD.

Margaréta Kotočová, Associate Professor, CCNA, CCAI

Dušan Malina

Peter Mesjar, CCNA, CCNP, CCAI, CCIE

Vladimír Michalec

Engineering Staff

Dušan Bernát

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, M. Zimen

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.
- Datalan Ltd.
- DITEC Ltd.
- GTEC Slovakia Ltd.
- Hewlett-Packard Slovakia Ltd.
- IBM Slovakia Ltd.
- Microsoft Slovakia Ltd.
- Tronet Ltd.
- Siemens Enterprise Communications Ltd.
- Soitron 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

11 Events Photo Gallery

12 FIIT Personnel

ANDREJČIKOVÁ, Nadežda, Ing.	Institute of Informatics and Software Engineering
ANDREJKO, Anton, Ing.	Institute of Informatics and Software Engineering
ANGELOVIČ, Peter, Ing.	Institute of Applied Informatics
BAGALA, Adrián, Ing.	Institute of Computer Systems and Networks
BAKIČA, Marián	Centre of Computing and Communication Services
BARLA, Michal, Ing.	Institute of Informatics and Software Engineering
BARTALOS, Peter, Ing.	Institute of Informatics and Software Engineering
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BELAJOVÁ, Lenka	Deanship – Study Affairs
BERNÁT, Dušan, Ing.	Institute of Computer Systems and Networks
BIELEKOVÁ, Alexandra, Ing.	Head of Administrative Department
BIELIKOVÁ, Mária, prof. Ing. PhD.	Institute of Informatics and Software Engineering
BOU EZZEDDINE, Anna, RNDr.	Institute of Informatics and Software Engineering
BRATH, Peter	Centre of Computing and Communication Services
BREZNENOVÁ, Soňa	Deanship – Personal Resources
CSONKOVÁ, Monika, Mgr.	Deanship – Research
ČERNANSKÝ, Michal, Ing. PhD.	Institute of Applied Informatics
ČIČÁK, Pavel, doc. Ing. PhD.	Institute of Computer Systems and Networks
DADO, Boris, Ing.	Institute of Computer Systems and Networks
DODOK, František, Ing.	Centre of Computing and Communication Services
DRAHOŠ, Peter, Ing.	Institute of Applied Informatics
DRGONEC, Vladimír, Ing.	Centre of Computing and Communication Services
FAZEKAŠ, Ľuboš, Ing.	Institute of Applied Informatics
FILKORN, Roman, Ing.	Institute of Informatics and Software Engineering
FLOCHOVÁ, Jana, Ing. PhD.	Institute of Computer Systems and Networks
FRIVOLT, Juraj, Mgr.	Institute of Informatics and Software Engineering
GALBAVÁ, Lucia, Mgr.	Institute of Informatics and Software Engineering
GALBAVÝ, Miroslav, Ing.	Institute of Applied Informatics
GNIPOVÁ, Marta, RNDr.	Centre of Computing and Communication Services
GOCKÝ, Michal	Centre of Computing and Communication Services
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HABUDOVOVÁ, Nikoleta, Mgr.	Institute of Informatics and Software Engineering
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HINKA, Martin, Ing.	Institute of Applied Informatics
HLUCHÝ, Pavol	Centre of Computing and Communication Services
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KALANIN, Peter, Bc.	Centre of Computing and Communication Services
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Annual Report 2007

Faculty of Informatics and Information Technologies
Slovak University of Technology in Bratislava

118 pages, 300 copies

Print Vydavateľstvo STU Bratislava
2008