

**FACULTY OF INFORMATICS
AND INFORMATION TECHNOLOGIES**

<http://www.fiit.stuba.sk>

ANNUAL REPORT

2005



Slovak University
of Technology
in Bratislava

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1 Introduction

The Annual Report of 2004 had a special significance for the IIT community because it showed activities in IIT which were carried out by the newly established faculty of the Slovak University of Technology – Faculty of Informatics and Information Technologies (FIIT STU). Also the Annual report of 2005 has a special significance for the IIT community because it shows how the FIIT STU fulfilled expectations of this community in the fields of education and research and how it has been managed. Following the long-term strategy of the faculty development the new study programmes and the new research activities have been promised. These activities of course required suitable conditions – to extend human resources, to improve services, to build new laboratories. Therefore our first priority was to have comparable working conditions as our colleagues from other the faculties of STU have.

The evaluation of the Long term strategy for the year 2005 showed that almost all tasks for this year have been successfully fulfilled. We are proud that there is a high interest from the side of 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. Nevertheless we have prepared the new study programme – Information systems – for graduate/master (Ing) level.

The Report shows the results achieved in research that is of high priority at FIIT STU. An interlink of research and education is not only declared but also documented by the research activities of our students. The results of research activities of our students have been presented at the 1st Student Research Conference organized by our faculty.

Unfortunately we have not been so successful in all our activities. Due to lack of room capacity for the staff as well as for the laboratories many activities have been slowed down or even stopped at all. Problem is that every new student and every new member of the staff does this situation worse and worse. We hope and believe that in the year 2006 this situation will improve.

The Report shows the current state the Faculty has achieved in education, research and cooperation with business partners. It also shows the current stage in the long-term strategy of the Faculty development.



Prof. Ľudovít Molnár
Dean of the FIIT STU

2 Faculty Management Bodies

According to the Act No. 131 of February 21, 2002 of 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 is divided into the employee part and the student part.

Members of the Academic Senate in 2005¹

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

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

Milan Kolesár, Professor
chair of the employee part

Ján Máté
chair of the student part

¹ as in December 2005; the Academic Senate has been changed in the year of 2005 according to the Rules of election of its members.

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

Mária Hricová

Members of the employee part of the Academic Senate
staff@as.fiit.stuba.sk

Igor Grellneth, PhD.

Ladislav Hudec, Assoc. Professor

Ivan Kapustík

Milan Kolesár, Professor

Gabriela Kosková, PhD.

Vladimír Kvasnička, Professor

Pavol Návrát, Professor

Martin Šperka, Assoc. Professor

Members of the student part of the Academic Senate
students@as.fiit.stuba.sk

Martina Chabadová

Michal Ďurfina

Ján Máté

Tomáš Minčeff

Activities of the Academic Senate of the Faculty in 2005

The Academic Senate of the Faculty of Informatics and Information Technologies in 2005

- 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,
- approved the members of the Disciplinary Commission of the Faculty and its Chairman, as presented by the Dean.

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 December 12, 2003 for a four year office period.

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 2005²

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

² as in December 2005; the Scientific Board has been changed in the year of 2005 according to the Rules of election of its members.

Pavol Návrat, Professor
Zdenka Riečanová, Professor
Martin Šperka, Assoc. Professor
Vladimír Vojtek, Professor

External members

Milan Česka, Professor – Brno University of Technology
Ladislav Hluchý, PhD. – Institute of Informatics, Slovak Academy of Sciences
Štefan Kimlička, Professor – Comenius University in Bratislava
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

Honorable members

Norbert Frišťacký, Professor – Slovak University of Technology in Bratislava

Activities of the Scientific Board of the Faculty in 2005

The Scientific Board of the Faculty of Informatics and Information Technologies in 2005

- discussed an update of the long-term strategy of the Faculty development for the 2005 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 2005/2006 offered by the Faculty,
- endorsed other experts with the right to conduct Final examinations in the study programmes offered by the Faculty (in accordance with the University Code),
- discussed and submitted to the Scientific Board of the university proposals for nomination of "professors" to:
 - Mária Bieliková (Institute of Informatics and Software Engineering, Faculty of Informatics and Information Technologies, Slovak University of Technology in Bratislava)
 - Eduard Kostolanský (Department of Informatics, Faculty of Science, University of St. Cyril and Methodius in Trnava)
- conferred the academic degree „philosophie doctor“ on:
 - Gabriela Kosková.

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 2005³

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

Ján Žiak - student of the doctoral degree programme

Tomáš Vanderka - student the master degree programme

Michal Ďurfina - student of the bachelor degree programme

³ as in December 2005; the Disciplinary Commission has been changed in the year of 2005 according to the Rules of election of its members.

3 Study

3.1 Undergraduate Study (Bc)

In the academic year 2004/2005 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 to study in two specialisations (study majors) – Software Engineering and Computer Engineering. This programme is accredited by the British Engineering Council following an accreditation process carried out by the Institution of Electrical Engineers (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 ⁴
Academic year 2002/2003 ¹	120	127	198	145
2003/2004 ¹	150	103	123	134
2004/2005	333	112	95 ¹	156
2005/2006	344	262	91	92

On the course we have 6 overseas students.

The number of graduates in Informatics in 2005 was 116. The students successfully defended their bachelor theses and passed the final examination.

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

- *Dean’s Award – The best student of the course*: Michal Barla, Igor Berta, Peter Daniš, Pavol Dragúň, Ľuboš Fazekaš, Michal Jemala, Juraj Malečka, Michal Sabo, Michal Tvarožek. Four students out of them completed their studies also with

⁴ only the students in study programme Informatics

honour “*Magna cum laude*”: Pavol Dragúň, Ľuboš Fazekaš, Michal Sabo, Michal Tvarožek,

- *Dean’s Award – Excellent Bachelor Thesis*: Martin Adam, Peter Bartalos, Andrej Ďurica, Peter Kasan, Martin Kováčik, Jozef Kytka, Peter Sivák, Ivan Škovran.

1 147 applicants took place in the entrance examination to bachelor study programmes on June 15, 2005. The written examination consisted of mathematics (20 tasks, 50 points max.) and informatics (12 tasks, 30 points max.) or physics (12 tasks, 30 points max.). The second subject was optional. 528 applicants were offered admission (341 Informatics, 187 Computer Systems and Networks), 344 out of them actually made use of it and were enrolled (229 Informatics, 115 Computer Systems and Networks).

3.2 Master Study (Ing)

In the academic year 2004/2005, FIIT STU offered two accredited study programmes:

- *Software Engineering* – regular length two or three years⁵
- *Computer systems and networks* (as an orientation in Computer Engineering) – regular length two or three years².

The “old” Informatics graduate study programme (with regular length three semesters) was offered too, but not for newly admitted students. The programme consists of two specialisations (study majors) – Software Engineering and Computer Engineering This programme is accredited by the British Engineering Council following an accreditation process carried out by the Institution of Electrical Engineers (UK).

We have prepared the new study programme – Information systems – for master (Ing) level and offered it first time in September 2005 (academic year 2005/2006).

Numbers of the full-time master programme students

	2002/2003	167
Academic year	2003/2004	151
	2004/2005	182
	2005/2006	231 ⁶

On the course we have 2 overseas students.

The number of graduates in Informatics in 2005 was 26. 20 out of them succeeded in defending their master thesis and passed the final examination in spring semester 2005 and 6 in autumn semester 2005. In autumn semester 2005 first cohort of newly accredited study programmes succeeded in defending their master theses and passed the final examination:

- 39 graduates in Software Engineering and
- 9 graduates in Computer Systems and Networks.

⁵ three years for students who have not obtained their first degree in related field.

⁶ 132 students were offered admission and 128 out of them actually made us of it and were enrolled.

The following students were conferred awards for their excellent results:

- *Dean's Award – "Magna cum laude":* Peter Horný, Milan Jamrich, Andrej Krištofič, Ľudovít Lučenič, Katarína Matušíková,
- *Dean's Award – "Cum laude":* Ladislav Gažo, Marek Kováč,
- *Dean's Award – Excellent Master Thesis:* Peter Argaláš, Juraj Buno, Peter Drahoš, Peter Dušek, Marek Gregor, Ľubomír Hlávek, Daniel Jókai, Michal Kadlic, Martin Kerni, Marek Kováč, Ľubomír Majtás, Lukáš Matušík, Katarína Matušíková. Martin Niejadlik, Szabolocs Puskas, Adrián Slavkovský, Attila Štrba, Peter Trnovský, Darina Záhradná,
- *Slovak Academy of Sciences Award for excellent Master Thesis:* Andrej Krištofič,
- *Tatra Bank Award for excellent Master Thesis:* Peter Horný.

132 applicants took part in an entrance examination on June 8, 2005 as a prerequisite to the master programmes (56 Software Engineering, 46 Computer Systems and Networks, 30 Information Systems – new study programme offered since the academic year 2005/06), 128 out of whom were enrolled. (55 Software Engineering, 45 Computer Systems and Networks, 28 Information Systems).

3.3 Doctoral Study (PhD)

Quality and number of doctoral students significantly influence the results obtained in research. We observe an insufficient number of doctoral students in the fields of informatics and information technologies. The graduates have excellent opportunities in finding positions in the labour market, therefore, even if they are interested in further studies they often prefer to be admitted as part-time students. This trend has been slightly reversed now. The number of full-time doctoral students is on an increase, however in 2005 is on the same level as in 2004.

Evolution of number of doctoral full-time students

Year	1999	2000	2001	2002	2003	2004	2005
Number of students	18	14	10	11	16	22	22

In 2005 one dissertation was defended:

- *Gabriela Kosková: Topographic organization of user preference patterns in collaborative filtering*

In 2005 the FIIT STU admitted students for study in newly accredited study programmes in doctoral study for the second 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 2005 several student competitions and conferences. The importance of involvement of the students in such events is very high. Students in 2005 took active participation in various technical and research activities (co)organised by the Faculty:

- ACM International Collegiate Programming Contest 2005,
- ACM CZ Student Research Competition 2005,
- IEEE Computer Society International Design Competition (CSIDC 2005),
- ProFIIT 2006 – Programming Competition for Secondary School Students,
- RoboCup, Soccer Simulation League,
- IIT.SRC 2006 – Informatics and Information Technologies Student Research Conference (to be mentioned in the following Section devoted to research in more detail).

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. The 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 2005, FIIT STU has organised or co-organised in year 2005 several scientific events:

- scientific conference *Cognition and Artificial Life V*,

- conference *IBM for the Universities*,
- scientific workshop *4th E-Learning Technology Seminar*,
- scientific conference *ICETA 2005 – 4th International Conference on Emerging Telecommunications Technologies and Applications*,
- international congress *ITAPA 2005 – Congress on Information Technologies and Public Administration*,
- scientific conference *SCCG 2005 – 21st Spring Conference on Computer Graphics*,
- scientific conference *SOFSEM 2005 – 31st Theory and Practice of Computer Science*,
- scientific conference – *8th International Conference Informatics 2005*
- scientific workshop *Theory and Practice of IT – ITAT 2005*
- scientific workshop *1st Slovak – Japanese Seminar on Intelligent Systems*.

The Faculty took part in providing technical and scientific programmes, especially through the work in programme committees of 26 conferences, mostly international:

- ADBIS, East-European International Conference on Advances in Databases and Information Systems,
- AKRR, International and Interdisciplinary Conference on Adaptive Knowledge Representation and Reasoning,
- CIKM, ACM International Conference on Information and Knowledge Management,
- Annual Conference on Cognition and Artificial Life,
- DATAKON, Annual Conference on the Current Trends in Databases and Information Systems,
- Conference on Data Security,
- DATE, Design Automation and Test in Europe,
- DDECS, IEEE Workshop on Diagnostics and Design of Electronic Circuits and Systems,
- ECDL, European Conference on Research and Advanced Technology for Digital Libraries,
- IADIS, Virtual Multi Conference on Computer Science and Information Systems – Intelligent Systems and Agents,
- ICETA, International Conference on Emerging e-Learning Technologies and Applications,
- ICSM, IEEE International Conference on Software Maintenance,
- International Human.Society@Internet Conference,
- ISIMD, International Symposium of Interactive Media Design
- ISD, International Conference on Information Systems Development,
- ISIM, International Conference on Information Systems Implementation and Modelling,
- ITAT, Workshop on Information Technologies – Applications and Theory

- ITI, International Conference on Information Technology Interfaces,
- MENDEL, International Conference on Soft Computing,
- RAAWS, International Workshop on Recommender Agents and Adaptive Web-based Systems,
- SCCG, Spring Conference on Computer Graphics,
- SOFSEM, Annual Conference on Current Trends in Theory and Practice of Informatics,
- TPEV, Technologies for E-Learning Seminar,
- VU, International Conference on Virtual University,
- ZNALOSTI, Annual Conference on Knowledge Acquisition, Representation and Exploitation,
- WEBIST, International Conference on Web Information Systems.

In 2005, 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 students' research conference – IIT.SRC 2005 – which was held on April 27, 2005. 49 students presented 38 research projects arranged in following sections:

- Artificial Intelligence and Computer Science,
- Security, Computer Systems and Networks
- Software Engineering
- Web Technologies and Information Systems.

The finals of the 3rd ACM CZ Student Research Competition were organised in November 2005 in Prague. Ten best bachelor and master student projects from 6 universities from the Czech Republic and Slovakia were presented. The project Spot-it – Going Beyond the Vision Loss Boundaries authored by our undergraduates Martin Adam, Michal Barla, Peter Sivák and Michal Tvarožek (supervisor M. Bieliková) won the 1st place.

4.3 Publications

Results of our research were published in 118 papers, which represents a 47% increase in comparison with 2005 (or 35% per capita increase). 79 scientific contributions were published in conference proceedings, 32 out of which were published in reviewed proceedings of international conferences. 12 scientific contributions were published in scientific journals and we have authors (co-authors -editors) of 8 books.

<i>Overview of other most significant activities in 2005</i>	UAPI	UISI	UPSS	FIIT
Membership in editorial boards of scientific journals	4	2	1	7
Membership in programme committees of international scientific conferences	7	25	2	34
Membership in programme committees of national scientific conferences	2	7	1	10
Membership in steering committees of scientific conferences	1	3	0	4

<i>Number of publications in 2005</i>	UAPI ⁷	UISI	UPSS	FIIT
Books and parts of books	4	1	-	5
Scientific works published in reviewed scientific journals	2	7	3	12
Scientific works published in journals	3	-	-	3
Scientific works published in conference proceedings	27	42	9	78
Presentations at scientific conferences and congresses	28	42	9	79
Citations	62	45	11	118
Conference proceedings editors	3	4	-	7
Published reviews	2	7	-	9

FIIT STU is a co-publisher of the international scientific journal „Computing and Informatics“ (until 2001 Computers and Artificial Intelligence). Two faculty staff members, Prof. Návrat and Prof. Frištacký are members of its editorial board.

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) formed an essential form of research organisation and scientific projects funding at the FIIT STU. In 2005 five VEGA projects progressed. Four projects were completed in 2005. Three new projects were prepared and approved for funding in 2006-2008. The Faculty, under the leadership of Prof. Návrat, participated in two international projects.

It is important that several new projects were prepared in 2005 and approved for funding. As mentioned above three VEGA projects were approved for funding from 2006. Three projects of the Cultural and Educational Grant Agency of the Ministry of Education of Slovak Republic (KEGA) submitted in 2005 started in the same year. These projects are described in reports of institutes presented in the following parts.

The projects were realized in research laboratories (description can be found in the parts devoted to individual institutes). In 2005 the following six research laboratories were included in the Slovak University of Technology network of high-tech laboratories:

- Virtual Reality Laboratory, head: M. Šperka,
- Laboratory of Database Technologies, head: V. Vojtek,

⁷ UAPI – Institute of Applied Informatics

UISI – Institute of Informatics and Software Engineering

UPSS – Institute of Computer Systems and Networks

- Intelligent Systems Laboratory, head: P. Návrat,
- Advanced Software and Web Technologies Laboratory, head: M. Bieliková,
- Computer Networks Laboratory, head: P. Čičák,
- Embedded Systems Laboratory, head: T. Krajčovič.

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

- Centre of network technologies , project leader: P. Čičák,
- Project studio for web-based information systems education, project leader: M. Bieliková, P. Návrat,
- Increasing reliability and security of the FIIT STU computer network, project leader: T. Krajčovič,
- IT resources for education in informatics, project leader: T. Krajčovič.

<i>Number of projects funded in 2004</i>	UAPI	UISI	UPSS
VEGA	3	1	1
KEGA	3	1	-
APVV	2	2	-
State programmes of research and development	-	1	-
European Social Funds	-	1	-
International projects	-	2	-
FIIT STU	8	8	1

<i>Overview of funds (in thousands SKK)</i>	UAPI	UISI	UPSS
VEGA	1 217	1 152	437
KEGA	204	401	-
APVV	846	1 233	
State programmes of research and development	-	8 430	-
European Social Funds	-	590	-
International projects	-	257	-
FIIT STU	2 267	12 063	437

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 19 secondary schools.

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 were trained in Birmingham thanks to remarkable support of the company Tronet 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 2005 to the IT Academy program.

In co-operation with GTEC Common Training and Consultation Centre (CTCC) was established. The main purpose of this centre is to offer technical training for the non-academy sphere. There are two special Networks technology Laboratories in this CTCC.

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 Tronet Ltd., BGS Ltd., DITEC Ltd., DATALAN Ltd., ASSET Ltd., HP Slovakia Ltd.

Other remarkable support the Faculty has obtained in cooperation with IBM Slovakia, Microsoft Slovakia, SUN Microsystems, SIEMENS and ORACLE. Cooperation with the above mentioned companies is based on special agreements.

5.3 Mobility programmes

FIIT STU has established various international relations for the purposes of students' and teachers' mobilities. Cooperation within the mobility programme Socrates/Erasmus is supported under these contracted agreements:

- Ghent University, www.ugent.be/en
- Ruhr-University Bochum, Faculty of Electrical Engineering and Information Technology, www.atp.ruhr-uni-bochum.de
- University of Maribor, Faculty of Electrical Engineering and Computer Science, Slovenia, Institute of Informatics, www.feri.uni-mb.si
- Brno University of Technology, Faculty of Information Technology, Czech Republic, www.fit.vutbr.cz
- ISEP, Institut Supérieur d'Electronique de Paris, Paris, www.isep.fr
- FH Nordakademie, Elmshorn, www.nordakademie.de
- TUW, Vienna University of Technology, Faculty of Electrical Engineering and Information Technology, www.tuwien.ac.at
- Växjö University in Sweden, School of Mathematics and Systems Engineering, www.vxu.se
- Universität Leipzig, www.uni-leipzig.de
- Universidad Politécnica de Madrid, Facultad Informática-UPM, www.fi.upm.es

In 2005, one incoming Erasmus student visited FIIT STU (from FH Nordakademie) and three our teachers were visiting the ISEP Paris.

Besides the Socrates agreements, a special agreement of cooperation was established with the Institut Supérieur d'Electronique de Paris (ISEP). Based on this agreement, students from ISEP will be visiting FIIT STU each summer for the training period of 1 month (July) to do their mandatory students' internship. In summer 2005 we hosted 8 students.

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 5 700 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, IEEE 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 Encyclopedia 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 students 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 80 personal computers of the faculty

staff and PhD students, 100 personal computers and workstations in the education and research laboratories and 10 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 development

7 Institute of Applied Informatics

E-mail: uapi@fiit.stuba.sk
Web: <http://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 application of computer graphics in virtual reality systems and in systems of enhanced reality, in visualization and human – computer interaction; and in the area of computational intelligence (neural networks, evolutionary algorithms, artificial life, simulation of social systems).

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

Vladimír Kvasnička, Professor

Jana Parížková

Jiří Pospíchal, Assoc. Professor

Martin Šperka, Assoc. Professor

Juraj Štefanovič, PhD.

Branislav Steinmüller (part time)

Ondrej Strnád, PhD. (part time)

Vladimír Vojtek, Professor

Researchers

Michal Čerňanský

Matej Makula

Viliam Solčány

External teachers

Mária Markošová, PhD.

PhD students

Peter Angelovič

Michal Bielik

Peter Drahoš

Peter Jurčovič

Peter Kapec

Alena Kovárová

Peter Lacko

Štefan Sudolský

Michal Takács

Peter Trebatický

Ján Žiak

7.2 Teaching

Undergraduate Study (Bc.)

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

Master Study (Ing.)

Course	Semester	Credits	Lecturer
Advanced Database systems	Spring	5	V. Vojtek
Computer Graphics II	Autumn	6	M. Šperka
Multimedia Computer Systems	Spring	5	M. Šperka
Neural Networks	Autumn	5	V. Kvasnička

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

7.3 Theses

Bachelor (Bc.) Theses

- Imrich Balko: *System for support of making university schedules*. May 2005. Supervisor: M. Galbavý.
- Michal Belušik: *Backup and recovery in relation database management systems*. May 2005. Supervisor: V. Vojtek.
- Igor Berta: *Backup and recovery in relation database management systems*. May 2005. Supervisor: V. Vojtek.
- Ivan Blanárik: *User identification interface*. May 2005. Supervisor: V. Vojtek.
- Marián Červenák: *Interactive collaboration three-dimensional visualization Models and Data*. May 2005. Supervisor: J. Žiak.
- Pavol Dragúň: *Dispatcher system*. May 2005. Supervisor: V. Vojtek.
- Andrej Ďurica: *Dispatcher system*. May 2005. Supervisor: V. Vojtek.
- Ľuboš Fazekaš: *Solving a game with evolution algorithm*. May 2005. Supervisor: J. Pospíchal.
- Andrej Fiflík: *Extension of applications for open standard augmented reality System ARToolKit*. May 2005. Supervisor: M. Šperka.
- Pavol Fülöp: *Use of genetic algorithm for optimization of functions*. May 2005. Supervisor: V. Kvasnička.
- Roman Fülöp: *Debugging program for experimental microcomputer*. May 2005. Supervisor: V. Kvasnička.
- Michal Habala: *Game for mobile devices*. May 2005. Supervisor: M. Čerňanský.
- Martin Hablák: *Data modelling*. May 2005. Supervisor: J. Parizková.
- Ľubomír Hromádka: *Dispatching system*. May 2005. Supervisor: V. Vojtek.
- Michal Jemala: *Neural networks and evolution algorithms*. May 2005. Supervisor: M. Makula.
- Peter Kasan: *Game for mobile devices*. May 2005. Supervisor: M. Čerňanský.
- Jozef Kriška: *Neural networks and evolution algorithms*. May 2005. Supervisor: M. Makula.
- Lukáš Kročka: *Multimedia information in regional information system*. May 2005. Supervisor: M. Galbavý.
- Peter Ledňa: *Utilization of simulated annealing to global optimization of functions*. May 2005. Supervisor: V. Kvasnička.
- Matej Macháč: *Automatic graph deployment in application EGRET*. May 2005. Supervisor: V. Solčány.

- Jozef Manduch: *Testing of extended MAC layer of network interface card and design by PLD technology*. May 2005. Supervisor: J. Parížková.
- Peter Mešťaník: *Neural networks with logical threshold neurons*. May 2005. Supervisor: V. Kvasnička.
- Tomáš Minčeff: *Distributed simulation environment based on Web3D technique*. May 2005. Supervisor: M. Šperka.
- Vladimír Mlynarovič: *Quality of software*. May 2005. Supervisor: J. Parížková.
- Peter Perec: *Multimedia information in regional information system*. May 2005. Supervisor: M. Galbavý.
- Miloš Radošinský: *Archiving system for project management*. May 2005. Supervisor: V. Vojtek.
- Marek Roháček: *System supporting examination timetables planning*. May 2005. Supervisor: M. Galbavý.
- Vladimír Straka: *System for support of university schedules generation*. May 2005. Supervisor: M. Galbavý.
- Ján Suchal: *Visual demonstration of various phenomena in field of neural networks*. May 2005. Supervisor: M. Makula.
- Peter Sýkora: *Automatic grass-cutter developed by genetic programming*. May 2005. Supervisor: J. Pospíchal.
- Kristian Szobi: *Neural networks editor*. May 2005. Supervisor: M. Čerňanský.
- Michal Šefara: *Editor of recurrent neural network*. May 2005. Supervisor: M. Čerňanský.
- Ivan Škovran: *Systems for modelling and viewing virtual reality models*. May 2005. Supervisor: M. Šperka.
- Tomáš Tatranský: *Pursuit evasion by neural networks*. May 2005. Supervisor: J. Pospíchal.
- Tomáš Vanderka: *Effectiveness of machine language programs*. May 2005. Supervisor: J. Parížková.
- Marián Vašš: *Integrated development environment for file system algorithms*. May 2005. Supervisor: J. Štefanovič.
- Jozef Wagner: *System supporting examination timetables planning*. May 2005. Supervisor: M. Galbavý.
- Ondrej Žáry: *Tool for heuristic definition of security policy*. May 2005. Supervisor: B. Steinmüller.
- Peter Židek: *Game for Mobile Devices*. May 2005. Supervisor: M. Čerňanský.

Master (Ing.) Theses

- Peter Argaláš: *Printed documents with virtual illustration*. December 2006. Supervisor: J. Štefanovič
- Daniel Brnák: *Probabilistic structure of directed percolation model in square lattice*. December 2006. Supervisor: M. Markošová

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- Andrej Burger: *Toolset for modelling and simulation of discrete systems*. December 2006. Supervisor: V. Solčány
 - Marek Čambál: *Authentication centre of biometric Data*. December 2006. Supervisor: B. Steinmüller
 - Marek Čatloš: *Improvements on a graphics engine for mobile devices*. December 2006. Supervisor: J. Štefanovič
 - Miroslav Dávid: *Detection of exceptional States in the Operating System*. December 2006. Supervisor: B. Steinmüller
 - Peter Drahoš: *Facial expressions animation*. May 2005. Supervisor: M. Šperka
 - Martin Donoval: *Information system for secure mobile communication*. December 2006. Supervisor: V. Vojtek
 - Peter Dušek: *A virtual graffiti*. December 2006. Supervisor: J. Štefanovič
 - Marek Fučila: *Optical orientation in the city and in buildings*. December 2006. Supervisor: J. Štefanovič
 - Ladislav Gažo: *Information system for mobile office*. December 2006. Supervisor: V. Vojtek
 - Michal Grosoš: *A system for secure communication over a GPRS Network*. December 2006. Supervisor: V. Vojtek
 - Milan Jamrich: *Training of echo state neural networks using simulated annealing algorithm*. May 2005. Supervisor: M. Makula
 - Peter Kapec: *Using fish-eye views to interactively display hyperdocuments*. May 2005. Supervisor: M. Šperka
 - Martin Kiselkov: *A study of servers for interactive augmented reality systems*. May 2005. Supervisor: J. Štefanovič
 - Marek Kováč: *Network application for interactive internet assessment of students*. December 2006. Supervisor: M. Šperka
 - Pavol Kul'ka: *Virtual university non-virtual resources management reservation subsystem*. May 2005. Supervisor: M. Galbavý
 - Milan Lehocký: *Extension of open inventor library*. May 2005. Supervisor: J. Štefanovič
 - Ján Mareták: *Training of neural networks using dual Kalman filters*. May 2005. Supervisor: M. Čerňanský
 - Ján Máté: *Computing environment for active file system*. May 2005. Supervisor: B. Steinmüller
 - Peter Mihálik: *Application of knowledge in timetabling/scheduling*. December 2006. Supervisor: M. Galbavý
 - Martin Niejadlik: *Information system for mobile communication*. December 2006. Supervisor: V. Vojtek
 - Juraj Pavlovič: *Multi-agent simulation of adaptive economics*. December 2006. Supervisor: J. Žiak
 - Ján Petreje: *Animation of visualised program*. Supervisor: J. Parížková

- Michal Petrov: *Time series processing with LSTM networks*. December 2006. Supervisor: M. Čerňanský
- Miroslav Rusnák: *Strategy emergence in multiagent systems*. December 2006. Supervisor: V. Kvasnička
- Pavol Slaný: *Stationary object monitoring*. May 2005. Supervisor: V. Vojtek
- Bohuslav Szabo: *System for obtaining additional information*. December 2006. Supervisor: M. Galbavý
- Peter Šimún: *An integrated development environment for creating source files*. December 2006. Supervisor: J. Parizková

7.4 Research laboratories

Virtual Reality Laboratory

Head: M. Šperka

Contact: martin.sperka@fiit.stuba.sk

Description: Laboratory serves mainly educational needs (students' projects in courses Computer Graphics, Multimedia computer systems and Human-computer interaction, with best students' results published at international conferences). The laboratory is equipped with programs for 3D modelling (3D Studio Max, Alias/Wavefront Maya), web cameras, and stereoscopic devices. Further equipment, like data projectors for creating immersive virtual reality, quality cameras and augmented reality glasses for enriched reality modelling is planned in the near future.

Laboratory of Database Technologies

Head: V. Vojtek

Contact: vladimir.vojtek@fiit.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.

7.5 Research projects

Information Processing in Distributed Environment of Intelligent Agents (VEGA 1/0161/03)

- Project leader:* V. Vojtek
- Members:* M. Galbavý, E. Molnár, V. Solčány, B. Steinmuller, M. Šperka, J. Štefanovič, P. Tiňo, J. Žiak, O. Grošek, K. Čípková, M. Greško, L. Satko, M. Vojvoda
- Supported by:* Scientific Grant Agency of the Ministry of Education of Slovak Republic and the Slovak Academy of Sciences
- Duration:* January 2003 – December 2005
- Description:* Design of methods for intelligent accessing, processing and presentation of information in distributed environment. Design of model for a distributed representation of a virtual environment composed of colonies of independent, but communicating agents capable of searching and processing information on the bases of its structural semantic specification with an emphasis on security during transfer and saving, and on authenticity of information. The goal of the project is to find suitable theoretical, as well as practical solutions which would be compatible with requirements on security, as well as transfer rate and user comfort during work in a distributed environment.

Echo State Neural Networks (VEGA 1/1047/04)

- Project leader:* J. Pospíchal
- Members:* V. Kvasnička, M. Čerňanský, Š. Babinec, J. Babjak, P. Lacko, M. Makula, P. Sarkoci, P. Trebatický
- Supported by:* Scientific Grant Agency of the Ministry of Education of Slovak Republic and the Slovak Academy of Sciences
- Duration:* January 2004 – December 2006
- Description:* The goal of the project is to study a modern approach to recurrent neural networks which is particularly suitable for both a time series prediction and modelling of cognitive processes in artificial neural systems. Neural network in this approach includes a block of neurons with a recurrent architecture which is randomly generated and the weight coefficient of its connections are fixed during the learning stage of the network. The input activities incoming to the neural network will be mapped onto a rich dynamic structure of activities of hidden neurons which are used as an input to the output neurons layer. The learning of this network consists in adjusting of weight coefficients between hidden neurons and output neurons. Weight coefficients between the hidden and the input neurons and in-between the hidden neurons are randomly generated and do not change during the learning stage. Current research emphasis is on an evolutionary improvement of networks bringing more robustness to the predictions quality.

Artificial Chemistry and Molecular Evolution (VEGA 1/0062/03)

- Project leader:* V. Kvasnička
Members: J. Pospíchal, M. Čerňanský, Š. Babinec, J. Babjak, P. Lacko, M. Makula, P. Sarkoci, P. Trebatický
Supported by: Scientific Grant Agency of the Ministry of Education of Slovak Republic and the Slovak Academy of Sciences
Duration: January 2003 – December 2005
Description: Biotic and abiotic molecular systems with kinetics determined by Eigen's replicator system are studied by methods of artificial chemistry. Molecules are represented by strings of tokens over a finite alphabet. These molecules are capable of a physical process called "folding" (an analogy with biomacromolecules RNA). Each molecule is evaluated by fitness on the basis of its particular folding. Molecules are placed in a chemical-reaction system where they take part in a reproduction process (with probabilities proportional to their fitness) consisting in a simple copying accompanied with mutations. The present *in-silico* approach offers conceptual and notional machinery for a deeper theoretical interpretation and description of molecular Darwinian evolution. In a swarm adaptation, such a system can also serve as a general optimization tool, using chemistry only as a metaphor for purely computational purposes.

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, Š. Sudolský
Supported by: Science and Technology Assistance Agency of Slovak Republic
Duration: January 2005 – December 2007
Description: Neural networks with echo states are studied, which are currently considered as one of the greatest innovations of neural networks towards the increase of their biological plausibility. The project studies microneural structures containing several hundreds of neurons, while the adaptation affects only the connections between hidden and output neurons with 1-step learning methods. Time in these networks is discrete, which allows also a simple introduction of a communication by spikes on synaptic connections between neurons. We are interested first in smaller modules - networks solving simpler tasks. By combination of these modules into greater wholes we shall obtain neural networks capable to solve also complex tasks. The model should be an important tool for modelling of reasoning processes and classification in artificial intelligence and cognitive science.

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: Science and Technology Assistance Agency of Slovak Republic
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.

Interdisciplinary study Design of interactive digital media (KEGA-3/3206/05)

Project leader: M. Šperka
Members: A. Kovárová, M. Bielik
Supported by: Cultural and Educational Grant Agency of the Ministry of Education of Slovak Republic
Duration: July 2005 – December 2008
Description: The goal of the project is to prepare conception of interdisciplinary study program "design of digital media" (design of Internet sites interface, interactive CD/DVD ROMs, user interfaces of the broad products spectrum - ranging from mobile phones, information kiosks, automatic teller machines until the interfaces of complex control systems - which penetrate to all spheres of human activity. They need - besides the technological foundations (electronics and software) user friendly interface, too. 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 schools, e.g. Slovak University of Technology (Faculty of Informatics and Information Technologies and Faculty of Architecture) - where the necessary infrastructure already exists.

7.6 Publications**Journals**

- PARÍZKOVÁ, J., MLYNÁR, J.: Aspect Approach to Visualization of Program. In: *Systémová integrace* (Systeme integration), 12 (2), (2005) 51-57. (in Slovak).
- PARÍZKOVÁ, J.: Comparing of Copy Operation for two Programming Languages. In: *Informatika v škole* (Informatics in School), 30 (7), (2005) (in Slovak).

- PARÍZKOVÁ, J.: Comparison of Quickness of Pixel Display for two Programming Languages In: *Informatika v škole* (Informatics in School), 30 (14), (2005) (in Slovak).
- PARÍZKOVÁ, J.: Programming Language Effectivity for Number Printing. In: *Informatika v škole* (Informatics in School), 30 (26), (2005) (in Slovak).
- TREBATICKÝ, P.: Recurrent neural network training with the Kalman filter-based techniques. In: *Neural Network World*, 15 (5), (2005) 471-488.

Conferences

- ANGELOVIČ, P.: Time Series Prediction Using RSOM and Local Models. In: *IIT.SRC 2005 – Informatics and Information Technology Student Research Conference*. Bratislava, April 2005, Slovak University of Technology, pp. 27-34.
- ANGELOVIČ, P.: RSOM and Local Model in Prediction Tasks. In: *Cognition and Artificial Life V. vol. 1*. J. Kelemen, V. Kvasnička, J. Pospíchal (Eds.). Smolenice, May 2005, Opava, Silesian University Press, pp. 35-45 (in Slovak)
- BABINEC, Š., POSPÍCHAL, J.: Optimisation of Echo State Neural Networks by Hebbian Learning and Genetic Algorithm. In: *Cognition and Artificial Life V. vol. 1*. J. Kelemen, V. Kvasnička, J. Pospíchal (Eds.). Smolenice, May 2005, Opava, Silesian University Press, pp. 47-61 (in Slovak).
- BABINEC, Š., POSPÍCHAL, J.: Two approaches to optimize echo state neural networks. In: *MENDEL 2005, 11th International Conference on Soft Computing*. R. Matoušek, P. Ošmera, P. (Eds.). Brno, June 2005, Brno University of Technology, pp. 39-44.
- BABIAK, J., KVASNIČKA, V.: Rediscovery of Hillclimbing with Learning. In: *Cognition and Artificial Life V. vol. 1*. J. Kelemen, V. Kvasnička, J. Pospíchal (Eds.). Smolenice, 30.5.-2.6.2005, Opava, Silesian University Press, pp. 63-68. (in Slovak)
- ČERŇANSKÝ, N., MAKULA, M.: Feed-forward Echo State Networks. In: *IJCCNN 2005, International Joint Conference on Neural Networks 2005*, Montreal, July 2005, CD, 4 p. IEEE Computer Society.
- DRAHOŠ, P., KAPEC, P.: Animating Human Faces Using Modified Waters Muscle Model. In: *CESCG 2005, 8th Central European Seminar on Computer Graphics*, I. Viola, J. Hladuvka, J. Žára (Eds.), Budmerice, April 2005, Vienna, Institute of Computer Graphics and Algorithms, Vienna University of Technology, pp. 141-148.
- KOVÁČ, M., ŠPERKA, M.: Distributed Collaborative Environment Based on Web 3D. In: *ICETA 2005, 4th Int. Conference on Emerging e-learning Technologies and Applications*, F. Jakab, V. Fedák et al. (Eds.). Košice, September 2005, Elfa. pp. 297-301.
- KOVÁČ, M., ŠPERKA, M.: E-learning and Distributed Collaborative Environment Based on Web3D. In: *Conference E-Learning and the Knowledge Society*. Berlin, September 2005. Communication & Cognition, Ghent (Belgium). Paper presented at conference, Proceedings will be published in 2006.

- KRIŠKA, J., MAKULA, M.: Neuroevolution of Augmenting Topologies. In: *Cognition and Artificial Life V. vol. 2*. J. Kelemen, V. Kvasnička, J. Pospíchal (Eds.). Smolenice, May 2005, Opava, Silesian University Press, pp. 637-650. (in Slovak)
- KVASNIČKA, V.: Symbolic theory of Hofstadter's Copycat system for analogy discovery. In: *Cognition and Artificial Life V. vol. 1*. J. Kelemen, V. Kvasnička, J. Pospíchal (Eds.). Smolenice, May 2005, Opava, Silesian University Press 2005, pp. 299-311.
- KVASNIČKA, V.: An Emergence of Game Strategy. In: *Informatics 2005, 8th conference with international participation*. I. Plander (Ed.), Bratislava, June 2005, Bratislava, ŠEVT 2005, pp. 67-72 (in Slovak)
- LACKO, P.: An Emergence of Game Strategy in Multiagent Systems. In: *IIT.SRC 2005 – Informatics and Information Technology Student Research Conference*. Bratislava, April 2005, Slovak University of Technology, pp. 41-48.
- LACKO, P.: A Comparison of Symbolic and Subsymbolic Approach of the Emergence of Game Strategy. In: *Cognition and Artificial Life V. vol. 1*. J. Kelemen, V. Kvasnička, J. Pospíchal (Eds.). Smolenice, May 2005, Opava, Silesian University Press, pp. 313-321 (in Slovak).
- LACKO, P.: A comparison of symbolic and subsymbolic approach in artificial intelligence. In: *MENDEL 2005, 11th International Conference on Soft Computing*. Matoušek, R., Ošmera, P. (Eds.). Brno, June 2005, Brno University of Technology 2005, pp. 163-168.
- LUČENIČ, Ľ., ARGALÁŠ, P., HALANOVÁ, Z., ŠOLTIS, M.: Foot Gait Analysis and Simulation. In: *CESCG 2005, 9th Central European Seminar on Computer Graphics*. M. Wimmer, J. Hladůvka, R. Mantiuk (Eds.). Budmerice, May 2005, Bratislava. pp. 101-107.
- MARETÁK, J., ČERŇANSKÝ, M.: Recurrent Neural Network Training with the Kalman Filter Based Techniques. In: *Cognition and Artificial Life V. vol. 2*. J. Kelemen, V. Kvasnička, J. Pospíchal (Eds.). Smolenice, May 2005, Opava, Silesian University Press, pp. 373-382. (in Slovak).
- MARKOŠOVÁ, M., HREBČÍK, M.: Language as a graph. In: *Cognition and Artificial Life V. vol. 2*. J. Kelemen, V. Kvasnička, J. Pospíchal (Eds.). Smolenice, May 2005, Opava, Silesian University Press, pp. 383-390.
- POSPÍCHAL, J., KVASNIČKA, V.: About bounded rationality while visiting a bar. In: *Cognition and Artificial Life V. vol. 2*. J. Kelemen, V. Kvasnička, J. Pospíchal (Eds.). Smolenice, May 2005, Opava, Silesian University Press, pp. 517-526 (in Slovak).
- POSPÍCHAL, J., KVASNIČKA, V.: Bounded rationality and frequenting a bar. In: *MENDEL 2005, 11th International Conference on Soft Computing*. R. Matoušek, P. Ošmera (Eds.). Brno, June 2005, Brno University of Technology, pp. 33-38.
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- ŠPERKA, M., STOLÁR, A: Graphic Design in the Age of Interactive Media. In: *3rd International Symposium of Interactive Media Design*. Istanbul, January 2005. Yeditepe University, p. 10.
- ŠPERKA, M., DRAHOŠ, P.: Human Face Expressions Animation and e-Learning. In: *6th Int. Conference Virtual University VU'05*. M. Huba (Ed.). Bratislava, December 2005, pp. 119-124.
- TREBATICKÝ, P.: Recurrent Neural Network Training with the Extended Kalman Filter. In: *IIT.SRC 2005 – Informatics and Information Technology Student Research Conference*. Bratislava, April 2005, Slovak University of Technology, pp. 57-64.
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- ŽIAK, J.: Design and Prototype Implementation of an Evolutionary Environment for Concurrent Object-Oriented Programming. In: *IIT.SRC 2005 – Informatics and Information Technology Student Research Conference*. Bratislava, April 2005, Slovak University of Technology, pp. 183-191.

Books

- KELEMEN, J., KVASNIČKA, V., POSPÍCHAL, J.: (Eds.): *Cognition and Artificial life V.*, Vols. 1 a 2. Opava, Salesian University 2005, Vol 1: 322 p., vol 2: 328 p. (in Slovak).
- KVASNIČKA, V., POSPÍCHAL, J.: *Computer Science for Social Sciences*, Comenius University Press, Bratislava 2005, 192 p. (in Slovak).
- RYBÁR, J., KVASNIČKA, V., FARKAŠ, I. (Eds.): *Language and Cognition*. Bratislava, Kalligram 2005, 424 p. (in Slovak).

Chapters of Books

- KVASNIČKA, V., POSPÍCHAL, J.: About inevitability of universal grammar. In: Rybár, J., Kvasnička, V., Farkaš, I. (Eds.): *Language and Cognition*. Bratislava, Kalligram 2005, pp. 361-390 (in Slovak).
- RYBÁR, J., KVASNIČKA, V., FARKAŠ, I.: Cognitive approach to exploration. In: Rybár, J., Kvasnička, V., Farkaš, I. (Eds.): *Jazyk a kognícia*. Bratislava, Kalligram 2005, pp. 13-20 (in Slovak).

Abstracts

- KVASNIČKA, V., POSPÍCHAL, J.: Holographic Reduced Representation in Artificial Intelligence and Cognitive Science, In: *Proc. of Abstracts of 1st Slovak -Japanese Seminar on Intelligent Systems*, September 2005, Herlany, Slovak Republic, organized by FEI TU Kosice and Waseda University, Tokyo, Japan
- POSPÍCHAL, J., KVASNIČKA, V.: The Tragedy of the Commons and a Learning Speed in El Farol Bar Problem, In: *Proc. of Abstracts of 1st Slovak – Japanese Seminar on Intelligent Systems*, 18.9.-20.9.2005, Herlany, Slovak Republic, organized by FEI TU Kosice and Waseda University, Tokyo, Japan
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- LACKO, P., KVASNIČKA, V., POSPÍCHAL, J.: An Emergence of Game Strategy in Multiagent Systems, In: *Proc. of Abstracts of 1st Slovak - Japanese Seminar on Intelligent Systems*, 18.9.-20.9.2005, Herlany, Slovak Republic, organized by FEI TU Kosice and Waseda University, Tokyo, Japan
- TREBATICÝ, P.: Recurrent Neural Network Training with the Kalman Filter Based Techniques, In: *Proc. of Abstracts of 1st Slovak - Japanese Seminar on Intelligent Systems*, 18.9.-20.9.2005, Herlany, Slovak Republic, organized by FEI TU Košice and Waseda University, Tokyo, Japan

Critiques and notices

- KVASNIČKA, V.: Polemics: Wisdom as a problem: Once more from the point of view of artificial intelligence and cognitive science. Answer to: Imrich Ruisel: Wisdom as a problem. *K&S* 1/2005. Rec. in: *K&S (Books and Society – Knihy a spoločnosť)*. 2005, Vol. 2, No. 4, p. 15 (in Slovak)
- POSPÍCHAL, J.: Life as an evolving network of relations. Notice of Fritjof Capra: *The Web of Life*. In: *K & S (Books and Society Knihy a spoločnosť)*. 2004, Vol. 2, No. 4, p. 15. (in Slovak)
- POSPÍCHAL, J.: About Cognition and Artificial Life in Smolenice Castle (in Slovak). In: *Spektrum*, 2005, Vol. XI, No.10, p. 9

7.7 Cooperation

Cooperation in Slovakia

- Faculty of Social and Economical Sciences, Comenius University, Project of development of Cognitive Science (responsible person E. Gál, PhD.)
- Faculty of Mathematics, Physics and Informatics, Comenius University, project of development of Cognitive Science (responsible person J. Šefránek, Assoc. Professor, J. Rybár, Assoc. Professor)

- Faculty of Electrical Engineering, Technical University Košice, Development of modern methods of education in Computational Intelligence (responsible person P. Sinčák, Professor)
- Faculty of Mathematics, Physics and Informatics, Neural network modelling of complex systems (responsible person I. Farkaš, PhD.)
- Ministry of Economy of the Slovak Republic, design of information system

International Cooperation

- Institute fuer Softwaretechnik und Interaktive Systeme, Technische Universität, Wien, Austria (agreement about exchange of students)
- 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) – preparation of common syllabus and mobility for students and teachers
- Faculty of Philosophy and Science, Silesian University in Opava: Organisation of a seminar on Artificial Life and Cognition (responsible person J. Kelemen, Professor)
- Faculty of Informatics, Humboldt University in Berlin, database and information systems

Visits of Staff Members

- *M. Šperka*: 3rd Int. Symposium of Interactive Media Design, ISIMD 2005, Istanbul, Turkey, January 4-10, 2005
- *V. Kvasnička*: Masaryk University, Brno, Czech Republic, January 6, 2005
- *A. Kovárová*: Building Effective Learning Communities, BELCOM 2005, Prague, Czech Republic, February 20-22, 2004
- *V. Vojtek*: Czech Technical University, Prague, April 4, 2005
- *V. Kvasnička*: Institute of Chemical Technology, Prague, Czech Republic, May 20-22, 2005
- *A. Kovárová*: 2nd E-learning conference SCO 2005, Brno, Czech Republic, May 25-26, 2005
- *B. Steinmüller*: 18th Accreditation Committee meeting, Piliscsaba, Hungary, June 1-3, 2005
- *M. Šperka*: World Summit Contributory Conference, Vienna, Austria, June 2-3, 2005
- *A. Kovárová*: Central European Multimedia and Virtual Reality Conference 2005, Prague, Czech Republic, June 8-10, 2005
- *M. Šperka*: European Commission, Assessment of Erasmus Mundus Proposals, Brussels, Belgium, June 12-17, 2005
- *J. Pospíchal, P. Lacko, P. Trebatický*: MENDEL 2005, Brno, Czech Republic, June 15-19, 2005

- *P. Lacko, P. Trebatický*: 3rd European Neuro-IT and Neuroengineering School, Venice, Italy, June 18-25, 2005
- *M. Čerňanský*: International Joint Conference on Neural Networks, IJCNN 2005, Montreal, Quebec, Canada, July 27 – August 6, 2005
- *M. Šperka*: E-learning and the Knowledge Society Conference and TN DEC meeting, Berlin, Germany, September 4-7, 2005
- *V. Solčány*: European Simulation Multiconference ESM 2005, Porto, Portugal, October 23-27, 2005
- *M. Šperka, V. Vojtek*: Computer Science Education Workshop CSEW 2005, Býkov, Czech Republic, October 20-21, 2005
- *V. Vojtek*: Government delegation, Berlin, Germany, November 3, 2005
- *M. Šperka*: Technical University, Brno, Czech Republic, November 11, 2005
- *M. Šperka*: Fellowship program FUTURE, Germany, November 14-15, 2005
- *V. Vojtek*: Seminar “Data networks building on the base of PLC technologies”, Saalbach, Austria, December 9-12, 2005

Visitors to the Institute

- 8 students from Institute Supérieur d’Electronique de Paris (I.S.E.P.), Paris, France for 4-weeks study stay in July 2005, supervised by J. Štefanovič
- Eduard Babulak, PhD., University of Quebec in Rimouski, Canada, November 2005
- Igor Klacansky, UCSD Cancer Center, San Diego USA, June 2005
- Tiffany S. Ferguson, CIS, CEE, & Russia Programs Specialist, U.S. Army International Technology Center – Atlantic, London, UK, September 2005
- Peter Brummer, University of Stuttgart, October 2005

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.

Vladimír Kvasnička

- Slovak Academic Society (founding member, since 1997)
- Slovak Artificial Intelligence Society (chairman, since August 29, 2000)
- Slovak Computer Science Society (member, since 1996)

Jiří Pospíchal

- Slovak Artificial Intelligence Society (member, since August 29, 2000)
- Slovak Computer Science Society (member, since 1996)

International Professional Organisations and Societies

Martin Šperka:

- European Academy of Digital Media (EADIM) (fellow, since 2001)

- EADIM Instructors Network (vice chairman, since 2003)

Viliam Solčány

- ACM member (member, since May 2004)

Jiří Pospíchal

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

7.9 Other Activities

- Journal of Computing and Information Technology – V. Vojtek: member of advisory board, since 1993
- Journal of Computing and Information Technology – V. Kvasnička: member of advisory board, since 2005
- MATCH Communications in Mathematical Chemistry – V. Kvasnička: member of advisory board, since 1998
- Neural Network World – V. Kvasnička: member of advisory board, since 2001
- Croatica Chimica Acta – V. Kvasnička: member of advisory board, since 2002
- ITI2005 – 27th International Conference on Information Technology Interfaces, Dubrovnik – V. Vojtek: member of programme committee
- DATAKON 2005, Brno, Czech Republic – V. Vojtek: member of programme committee
- Cognition and Artificial Life V, Smolenice, Slovakia – V. Kvasnička: the chairman of steering committee, M. Čerňanský, P. Lacko, M. Makula, J. Pospíchal, P. Trebatický: members of organising committee.
- MENDEL 2005 – 11th International Conference on Soft Computing, Brno, Czech Republic – V. Kvasnička, J. Pospíchal: members of programme committee
- Spring Conference on Computer Graphics, Budmerice, Slovakia – M. Šperka: member of programme committee
- WEBIST (First International Conference on Web Information Systems), Miami, USA – M. Šperka: member of programme committee
- VU 2005 – 6th International Conference Virtual University, Bratislava, Slovakia – M. Šperka: member of programme committee
- ICETA 2005 – 4th International Conference on Emerging e-Learning Technologies and Applications, Košice, Slovakia – M. Šperka: member of programme committee
- Organisation of a soft computing seminar in collaboration with Department of Mathematics FCHPT STU,
www.fiit.stuba.sk/~kvasnicka/QuantumComputing/index.html
- Organisation of a Fifth Conference on Cognition and Artificial Life,
<http://hilbert.chof.stuba.sk/KUZV/>
- Participation in a grant #3/3135/05 (KEGA - Cultural and Educational Grant Agency of the Ministry of Education) New forms of university study in Artificial

-
- Intelligence in Slovak Republic, in 1/2005 - 12/2007, main investigator - P. Sinčák, FEI TU Košice, investigator from FIIT STU – V. Kvasnička.
 - Participation in a grant # 3/3253/05 (KEGA - Cultural and Educational Grant Agency of the Ministry of Education) Art forms in communication design, in 3/2005 - 12/2007, main investigator L. Horník, investigator from FIIT STU – M. Šperka.

8 Institute of Computer Systems and Networks

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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

Deputy director

Ladislav Hudec, Assoc. Professor

Administrative department

Katarína Pribišová

Teaching staff

Pavel Čičák, Assoc. Professor

Boris Dado

Jana Flochová, PhD.

Norbert Frištacký, Professor (part time)

Elena Gramatová, PhD. (part time)

Igor Grellneth, PhD.

Pavol Horváth, Professor

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

Dušan Bernát

Jamal Hasan, PhD.

Daniela Kotmanová

PhD students

Adrian Bagala

Roland Bott

Hossam El-Ddin M. Hussin

Timotej Török

8.2 Teaching

Undergraduate Study (Bc.)

Course	Semester	Credits	Lecturer
Computer Architecture	Spring	6	M. Kolesár
Computer Application Methods	Autumn	6	P. Čičák
Computer Networks II	Spring	6	I.Grellneth
Computer Networks I	Autumn	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	Spring	6	T. Krajčovič
Logic Circuits	Autumn	6	M. Kolesár
Peripheral Devices	Autumn	4	P. Horváth
Programmable Logic	Spring	6	M. Kolesár
Specification and Description Languages	Autumn	6	K. Jelemenská

Master Study (Ing.)

Course	Semester	Credits	Lecturer
Communication Services and Networks	Spring	5	M.Kotočová
Computer Architecture II	Autumn	4	L. Hudec
Communication Services and Networks	Autumn	5	M. Kotočová
Computing Systems Security	Spring	6	L. Hudec
Diagnostics and Reliability	Spring	5	E.Gramatová
Digital Systems Design	Spring	5	N. Frištacký
Digital Systems Formal Models	Spring	5	N. Frištacký
Digital Systems Testing	Autumn	5	E. Gramatová
Diploma Project I-III (Computer Systems and Networks)	Autumn Spring	4-10-21	M.Kolesár
Embedded Systems	Spring	5	T.Krajčovič
Internet Security	Spring	5	L.Hudec
Parallel Processing	Spring	5	D. Bernát
Specification and Description Languages	Autumn	6	K. Jelemenská
Team Project I-II (Computer Systems and Networks)	Autumn Spring	6-6	J.Hudec

8.3 Theses

Bachelor (Bc.) Theses

- Martin Blesák: *System for concentration of parallel interfaces*. May 2005.
Supervisor: D. Bernát
- Ján Borlok: *Analysis of behavior in VHDL language*. May 2005.
Supervisor: J. Hasan
- Martin Cerva: *Step by step application development in Visual C++*. May 2005.
Supervisor: B. Dado
- Igor Čahoj: *A multimedia presentation of information*. May 2005.
Supervisor: B. Dado

- Slavomír Červeň: *Peer-to-peer client for files sharing*. May 2005.
Supervisor: M. Kotočová
- Adrien Farkaš: *Analysis of TCP/IP stack implementation*. May 2005.
Supervisor: D. Bernát
- Andrej Fenik: *Testing of security weaknesses in computer networks*. May 2005.
Supervisor: L. Hudec
- Marek Gecelovský: *Study of harmful EM radiation of mobile systems (GSM)*.
May 2005. Supervisor: J. Hasan
- Štefan Gembický: *Review of programming languages for the needs of interactive web*. May 2005. Supervisor: I. Grellneth
- Vladislav German: *Monitoring panel for PC*. May 2005. Supervisor: D. Malina
- Lubomír Hanuliak: *Testing of security weaknesses in computer networks*.
May 2005. Supervisor: L. Hudec
- Martin Herceg: *RFID Card user authentication*. May 2005. Supervisor: D. Bernát
- Peter Jalec: *Study of harmful EM radiation of mobile systems (GSM)*. May 2005.
Supervisor: J. Hasan
- Peter Kiselkov: *Analyzer of combinational circuits with gate structure*. May 2005.
Supervisor: M. Kolesár
- Roman Korček: *Testing of security weaknesses in computer networks*. May 2005.
Supervisor: L. Hudec.
- Milan Korenica: *Classification of user and files based upon their mutual interaction*. May 2005. Supervisor: D. Bernát
- Martin Kováčik: *Web Application for interactive registration of user data*.
May 2005. Supervisor: I. Grellneth
- Michal Krakovský: *On-line diagnostics and designing of checkers*. May 2005.
Supervisor: E. Gramatová
- Ján Krištof: *Support system for peer-to-peer technology learning*. May 2005.
Supervisor: D. Bernát
- Jozef Kytka: *Multimedial learning module of Petri Nets*. May 2005.
Supervisor: K. Jelemenská
- Michal Lokša: *Program for transformation record of specification for behavior digital subsystem to language C in software implementation*. May 2005.
Supervisor: N. Frištacký
- Roman Malast: *Educational system for visualization of data security*. May 2005.
Supervisor: D. Malina
- Juraj Malečka: *Tools for computer networks learning support*. May 2005.
Supervisor: M. Kotočová
- Miroslav Mateja: *Systems with group servicing and group incoming*. May 2005.
Supervisor: D. Malina
- Milan Melicherčík: *Testing of extended MAC layer of network adapter and its design in PLD environment*. May 2005. Supervisor: J. Hudec

- Maroš Mičuda: *Parameters and evaluating of reliability of electronic systems*. May 2005. Supervisor: E. Gramatová
- Marián Miština: *Multimedia presentation of information*. May 2005. Supervisor: B. Dado
- Martin Močol: *Program system for asynchronous sequential circuit synthesis Support*. May 2005. Supervisor: E. Tomalová
- Igor Peev: *Internet application for secure client authentication*. May 2005. Supervisor: I. Grellneth
- Peter Polačko: *Multimedial learning module for system C*. May 2005. Supervisor: K. Jelemenská
- Rami Al Beyrouti: *Situation study of mobile computing system (GSM)*. May 2005. Supervisor: J. Hasan
- Róbert Smiščík: *On-line testing and design of checkers*. May 2005. Supervisor: E. Gramatová
- Michal Strhan: *Education support system for peer-to-peer technology*. May 2005. Supervisor: B. Dado
- Peter Šinkovič: *Multimedial learning module for VHDL language*. May 2005. Supervisor: K. Jelemenská
- Peter Štuller: *The case study harmfulness of the EM radiance from the mobile computer system (GSM)*. May 2005. Supervisor: J. Hasan
- Ján Václavík: *Design and implementation of algorithm for functional test generator of VLSI circuits*. May 2005. Supervisor: J. Hudec
- Filip Valášek: *Support of creation of expert's testimony in electrical engineering branch*. May 2005. Supervisor: L. Hudec
- Ladislav Venczel: *Testing of network interface card's MAC sublayer and design in PLD*. May 2005. Supervisor: J. Hudec

Master (Ing.) Theses

- Viliam Bedeč: *System for creating HTML presentations from information materials*. May 2005. Supervisor: B. Dado
- Ľudovít Fülöp: *Virtual university*. May 2005. Supervisor: B. Dado
- Peter Grodovsky: *Implementation of security policy model in firewalls*. May 2005. Supervisor: L. Hudec
- Ľubomír Hlávek: *Program system for detection and elimination of static hazards*. May 2005. Supervisor: M. Kolesár
- Eduard Chrvala: *Automatic detector of dynamics hazards*. May 2005. Supervisor: M. Kolesár
- Michal Kadlic: *Software for processing of meteorological data*. May 2005. Supervisor: P. Čičák
- Andrej Kováčik: *Functional test generator for VLSI circuits*. May 2005. Supervisor: J. Hudec

- Roman Páterek: *System for management network elements*. May 2005.
Supervisor: M. Kotočová
- Ivan Straka: *Control of network channel characteristic*. May 2005.
Supervisor: D. Bernát
- Attila Štrba: *Teamwork strategies in multiagent systems*. May 2005. Supervisor: T. Krajčovič
- Juraj Varíny: *Implementation of system resources Allocation Policy*. May 2005.
Supervisor: D. Bernát
- Rastislav Bódi: *Configuration generator for Cisco routes*. December 2005.
Supervisor: B. Dado
- Juraj Buno: *Serial interface concentrator*. December 2005. Supervisor: D. Bernát
- Miroslav Jakubovský: *Error correcting Reed-Solomon codes on interactive Web*.
December 2005. Supervisor: I. Grellneth
- Martin Kerni: *Network application for interactive internet assessment of students*.
December 2005. Supervisor: I. Grellneth
- Juraj Malcho: *Simulator of a technological system*. December 2005. Supervisor: T. Krajčovič
- Peter Mulinka: *Modelling, specification and verification of logic circuits*.
December 2005. Supervisor: D. Kotmanová
- Miloš Sýkora: *Enforcement of security policies in databases*. December 2005.
Supervisor: L. Hudec

8.4 Research laboratories

Computer Networks Laboratory

Head: P. Čičák

Contact: pavel.cicak@fiit.stuba.sk

Description: The research and teaching laboratory is predefined for teaching computer networks to undergraduates and graduates 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. The laboratory is equipped with modern network components and respective software tools.

Embedded Systems Laboratory

Head: T. Krajčovič

Contact: tibor.krajcovic@fiit.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

Head: J. Hudec

Contact: jan.hudec@fiit.stuba.sk

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

8.5 Research projects

Methods and Tools for Development of Secure Networked and Distributed Mobile Computer Systems and their Management (VEGA 1/0157/02)

Project leader: L. Hudec

Members: A. Bagala, D. Bernát, P. Čičák, B. Dado, N. Frištacký, I. Grellneth, J. Hasan, El-Ddin Hossam Hussin, J. Hudec, K. Jelemenská, M. Kolesár, D. Kotmanová, M. Kotočová, T. Krajčovič, D. Malina, E. Tomalová, T. Török

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

Duration: January 2003 – December 2005

Description: Research aim of this project are the following: creation of a novel effective formal specification tool and of a development (refinement) environment based on autonomous agents and on processes that are aimed mainly at specifications of complex digital systems (with employment of complex library elements described by “soft” or “firm” description means) mainly oriented towards microsystems implementation; 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; elaboration of new methodology for VLSI system design and testing at the functional level that is applicable to integration into ASIC and PLD design.

8.6 Publications

Journals

- FRIŠTACKÝ, N., GRAMATOVÁ, E.: Design and Test of Digital Systems (Preface). In: *Computing and Informatics*. – Vol. 24, No. 5-6, (2005), pp. 409-413
- KINDER, R., HUDEC, L. – BLAŽÍČEK, M.: An Automatic Measurement System with Hall Profiling and a Four Point Probe for Characterization of Semiconductors. In: *Journal of Electrical Engineering*. - Vol. 56, No. 9-10, (2005), pp. 270-273.
- KOLESÁR, M.: Shortly from the history of the FEI Alumni IV (2003). In: *EE – časopis pre elektrotechniku a energetiku*. (Journal for Electrical Engineering and Power Engineering) – Vol. 11, No. 2 (2005), p. 39. (in Slovak)
- KOLESÁR, M.: Shortly from the history of the FEI Alumni V (2004). In: *EE – časopis pre elektrotechniku a energetiku*. (Journal for Electrical Engineering and Power Engineering) – Vol. 11, No. 4 (2005), p. 39. (in Slovak)
- ZOLOTOVÁ, I., FLOCHOVÁ, J., OCELÍKOVÁ, E.: Database technology and real time industrial transaction techniques in control. In: *Journal of Cybernetics Informatics*. – No. 5 (2005).

Conferences

- BAGALA, A., BOTT, R.: Security Mechanism in Grid Environments. In: *IIT.SRC 2005 – Informatics and Information Technology Student Research Conference*. Bratislava, April 2005, Slovak University of Technology, - pp. 96-102. (ISBN 80-227-2217-0)
- ČIČÁK, P., MOSTAFA, H.: Handling the Connection Interruption in Mobile Internet. In: *Communication and Information Technologies, 3rd*. Scientific Conference with International Participation, Tatranské Zruby, November 2005, - pp. 201 - 204.
- FLOCHOVÁ, J., AUXT, F.: Supervisory Control Simulation and Web-based Teaching. In: *Proceedings of International Conference Cybernetics and Informatics*. Dolný Kubín, Slovak Republic, February 2005, - pp. 158-162
- HUDEC, J.: Functional Test Generator for VLSI Circuits. In: *19th Int. Conference on Systems for Automation of Engineering and Research (SAER2005)*, Romanski Radi (ed.). Varna, September 2005, ICT Development Agency 2005. - pp. 46-50.
- HUDEC, L.: Solving of computer security accidents. In: *Bezpečnosť dát 2005 (Data Security 2005)*, Bratislava, April 2005, AEC Data Security, - pp. 24-34. (in Slovak)
- KARDOŠ, M., FRIŠTACKÝ, N.: Functional Verification for UML-based Model Driven Design of Embedded Systems. In: *International Embedded Systems Symposium - IESS 2005*. A. Rettberg, M.C. Zanella, F.J. Rammig (Eds.), Manaus, Brazil, August 2005, Springer-Verlag, 2005, IFIP Series Vol. 184, - pp. 103-114.
- KRAJČOVIČ, T.: Simulator for Embedded System. In: *Applied Electronics 2005*, Pilsen, September 2005, University of West Bohemia. - pp. 193-196.
- MOSTAFA, H.: Home Agent-Based Decentralized User-Mobility with EPA-Selection. In: *IIT.SRC 2005 – Informatics and Information Technology Student Research*

Conference. Bratislava, April 2005, Slovak University of Technology, - pp. 103-107.

ZOLOTOVÁ, I., FLOCHOVÁ, J., OCELÍKOVÁ, E.: Database Technology and Real Time Industrial Transaction Techniques In: *Proceedings of Int. Conf. Cybernetics and Informatics*, Dolný Kubín, February 2005, pp.214-219

Reviews

KOLESÁR, M.: (rev.): Pocket-PC Boolean Function Simplification. /Aut: Bitincka, L. Antoniou,G.E./ – In: *Journal of Electrical Engineering*, No. 7-8, Vol. 56, (2005). – pp.209-212

8.7 Cooperation

Cooperation in Slovakia

- Institute of Informatics, Slovak Academy of Sciences, Bratislava
- Slovak University of Technology in Bratislava, Faculty of Electrical Engineering and Information Technology
- Technical University in Košice, Faculty of Electrical Engineering and Information Technology
- Matej Bel University in Banská Bystrica, Faculty of Natural Sciences
- University of Žilina, Faculty of Management Science and Informatics
- University of Žilina, Faculty of Electrical Engineering
- Infostat Bratislava
- Tatra Banka Bratislava
- Compaq Computer Slovakia Ltd.
- Microsoft Slovakia Ltd.
- IBM Slovakia Ltd.
- Oracle Slovakia Ltd.
- Datalan Ltd.
- MOLPIR LTD.
- Siemens Ltd.
- Tempest Ltd.
- CISCO Systems GTEC Slovakia Ltd.

International Cooperation

- Czech University of Technology, Department of Computers, Prague, Czech Republic
- Technical University in Brno, Faculty of Information Technologies, Brno, Czech Republic

- University of West Bohemia in Plzen, Department of Computers, Pilsen, Czech Republic
- Technical University in Sofia, Faculty of Computer Systems and Control, 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

Visitors to the Institute

- Eduard Babulak, PhD., University of Quebec in Rimouski, Canada, July 2005
- Eduard Babulak, PhD., University of Quebec in Rimouski, Canada, October 2005

Visits of Staff Members

- *I. Grellneth*: : Building Effective Learning Communities BELCOM 2005, Prague, Czech Republic, February 20-22, 2005
- *P. Čičák, I. Grellneth, P. Mesjar*: Annual Conference Cisco Networking Academy Program Czech and Slovak Republic 2005, Brno, Czech Republic, April 8-9, 2005
- *I. Grellneth, P. Mesjar*: Technology Innovation Centre at Millenium Point, Birmingham, United Kingdom, July 23 – August 7, 2005
- *T. Krajčovič*: Applied Electronics 2005, Pilsen, Czech Republic, September 7-9, 2005
- *P. Čičák*: CISCO Academy Conference 2005, Universidad Politecnica de Valencia, Spain, September 6-9, 2005
- *K. Jelemenská*: Training Course “Using Handel-C with DK”, Abingdon, Oxfordshire, United Kingdom, September 19-24, 2005
- *P. Čičák*: Faculty of Electrical Engineering and Computer Science, Technical University, Ostrava, Czech Republic, September 30 – October 1, 2005
- *M. Kolesár, J. Hudec, K. Jelemenská*: HDL Design Seminar Mentor Graphics, Technical University, Brno, Czech Republic, October 10, 2005
- *P. Čičák, T. Krajčovič*: Computer Science Education Workshop CSEW 2005, Býkov, Czech Republic, October 20-21, 2005
- *L. Hudec*: 163rd meeting of the COST Senior Officials Committee, Reading, United Kingdom, November 22-25, 2005

8.8 Membership in Professional Organisations and Societies

Slovak Professional Organisations and Societies

Norbert Frištacký

- Slovak Academic Society, member (member, since 1997)
- Society for Computer Science, member (member, since 1991)

- Society for Cybernetics and Informatics (member, since 1991)

Jamal Hasan

- Slovak Nuclear Society, member (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 1997)

International Professional Organisations and Societies

Norbert Frištacký

- Institute of Electrical and Electronic Engineers, IEEE (member, since 1991)
- IEEE Computer Society (member, since 1991), Computer Pioneer Award (1996)
- IFIP (Technical Committee TC-10: Computer Systems Technology member, since 1992; Working group TC10-5: Design and Engineering of Electronic Systems member, since 1993)

Ján Hudec

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

Ladislav Hudec

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

8.9 Other Activities

- Computing and Informatics (CAI) – N. Frištacký: member of the Board of Editors (since 1979), member of the Board of Editors Executive Committee (since 2000)
- National COST Coordinator, L. Hudec (since 1993)
- Member of the COST Senior Officials Committee, L. Hudec (since 1993)
- Data Security 2005 Conference, April 21, Bratislava, L. Hudec: chair of programme committee
- DATE 2005 – Design, Automation and Test in Europe – N. Frištacký: member of programme committee
- DDECS 2005 – IEEE Workshop on Diagnostics and Design of Electronic Circuits and Systems – N. Frištacký: member of programme committee
- ICETA 2005 – 4th International Conference on Emerging e-Learning Technologies and Applications, Košice, Slovakia – P. Čičák: member of programme committee
- Spektrum – M.Kolesár, member of the editorial board (since 2003)
- Kolesár, M. – review of book: Architectures of Computer Systems: Hardware. /Jelšina, M., Hauliš, M., Dzuriak, M., Ádám, N. – Elfa, Košice (2005). – 218 p. /

9 Institute of Informatics and Software Engineering

E-mail: uisi@fiit.stuba.sk
Web: <http://uisi.fiit.stuba.sk>
Tel: +421 2 654 11 461
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.

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

Secretary

Viera Rozinajová, PhD.

Administrative department

Zuzana Macková

Teaching staff

Mária Bieliková, Professor

Anna Bou Ezzeddine

Lucia Galbavá

Daniela Gregušová, Assoc. Professor (part time)

Ľubica Hanulová (part time)

Zuzana Husárová (part time)

Ivan Kapustík

Štefan Kimlička, Professor (part time)

Dagmar Komorová (part time)

Jana Minárová, Assoc. Professor (part time)

Ľudovít Molnár, Professor

Pavol Návrat, Professor

Martin Nehéz (part time)

Jozef Papula, Professor (part time)

Ivan Polášek, PhD. (part time)

Ivan Polický

Anna Považanová

Viera Rozinajová, PhD.
 Lubor Šešera, PhD. (part time)
 Valéria Šimáková (part time)

Researchers

Roman Filkorm
 Michal Barla (part time)
 Peter Bartaloš (part time)
 Vojtech Imrecze (part time)
 Gabriela Kosková , PhD.
 Juraj Malečka (part time)
 Michal Tvarožek (part time)
 Valentino Vranić, PhD.

External teachers

Imrich Lenharčík
 Karol Nemoga, Assoc. Professor
 Jiří Šafařík, Professor

PhD students:

Anton Andrejko
 György Frivolt
 Vladimír Grlický
 Jaroslav Jakubík
 Martin Kiselkov
 Matej Košík
 Jaroslav Kuruc
 Marián Lekavý
 Ján Máté
 Vladimír Marko
 Matúš Navarčík
 Martin Šechný

9.2 Teaching

Undergraduate Study (Bc.)

Course	Semester	Credits	Lecturer
Algorithms and Programming	Autumn	6	J. Minárová
Artificial Intelligence	Spring	6	P. Návrat
Entrepreneurship and Management	Autumn	5	J. Papula
Final Bachelor Project I-II	Autumn Spring	3-9	P. Návrat
Functional and Logic Programming	Autumn	6	M. Bieliková
Theoretical Foundations of Informatics	Spring	6	M. Nehéz
Information and Communication Technologies Law	Spring	5	D. Gregušová

Course	Semester	Credits	Lecturer
Object Oriented Programming	Spring	6	J. Minárová
Programming Languages (Object-Oriented Programming)	Spring	4	V. Vranić
Programming Languages and Compilation	Autumn	6	L. Molnár
Data Structures and Algorithms	Autumn	6	P. Návrat
Principles of Information Systems	Autumn	5	Š. Kimlička
Principles of Software Engineering	Spring	7	M. Bieliková
Programming Seminar	Autumn	0	G. Kosková
Procedural Programming	Autumn	6	G. Kosková
Specifications Methods and Tools	Spring	6	L. Molnár

Master Study (Ing.)

Course	Semester	Credits	Lecturer
Design of Compilers	Autumn	6	L. Molnár
Diploma Project I–III (Software Engineering, Information Systems)	Autumn Spring	4-10-21	P. Návrat
Knowledge-Based Systems	Autumn	6	I. Kapustík
Management in Software Engineering	Spring	6	M. Bieliková
Object-Oriented Analysis and Design	Autumn	5	I. Polášek
Project Management in Software Engineering	Spring	5	M. Bieliková
Quality of Software	Spring	4	I. Lenharčík
Architecture of Software Systems	Autumn	4	P. Návrat
Architecture of Software Systems II	Spring	5	L. Šešera
Principles of Web Engineering	Autumn	5	M. Bieliková
Team Software System Development I-II	Autumn Spring	6-6	M. Bieliková
Team Information System Development I-II	Autumn Spring	6-6	M. Bieliková

9.3 Theses

Bachelor (Bc.) Theses

- Adam Martin: *CSIDC 2005*. May 2005. Supervisor: M. Bieliková
- Lukáš Adamec: *Design and implementation of the Web presentation of central cultural workplace*. May 2005. Supervisor: V. Šimáková
- Michal Barla: *CSIDC 2005*. May 2005. Supervisor: M. Bieliková

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- Peter Bartalos: *Complexity analysis of routing algorithms for computer networks*. May 2005. Supervisor: M. Nehéz
 - Marek Braun: *Document presentation for Web with semantics*. May 2005. Supervisor: R. Filkorn
 - Juraj Brosz: *System for dispatching of student works through Internet*. May 2005. Supervisor: A. Považanová
 - Eubomír Cabáňik: *CASE tool utilisation for object oriented software system design*. May 2005. Supervisor: J. Minárová
 - Rudolf Dačo: *Visualization of parameters on communication protocols in unreliable networks*. May 2005. Supervisor: M. Nehéz
 - Martin Darula: *Visualization of text document collections*. May 2005. Supervisor: G. Kosková
 - Michal Ďurfina: *Support of visual design for data pipes and filters architecture Styles*. May 2005. Supervisor: V. Marko
 - Tomáš Hajas: *Object-oriented programming and Smalltalk*. May 2005. Supervisor: A. Považanová
 - Martin Halák: *Support of teaching of specifications methods and tools*. May 2005. Supervisor: D. Komorová
 - Ladislav Kočiš: *System for written student projects submission over Internet*. May 2005. Supervisor: A. Považanová
 - Martin Komara: *Scientific calculator on mobile platform*. May 2005. Supervisor: V. Marko
 - Attila Kotrba: *Abstract computer RASP simulator*. May 2005. Supervisor: M. Nehéz
 - Mário Lenický: *Building inventory visualization system*. May 2005. Supervisor: D. Komorová
 - Tomáš Matúšek: *Sematic Web-based portal of the institute*. May 2005. Supervisor: V. Grlický
 - Róbert Neubauer: *Mobile agents*. May 2005. Supervisor: I. Kapustík
 - Tomáš Ölvecký: *Language identification of Slavic Web pages*. May 2005. Supervisor: M. Bieliková
 - Ján Perďoch: *Presentation of history of informatics on STU*. May 2005. Supervisor: V. Šimáková
 - Pavol Prikryl: *System for managing student works with use Internet*. May 2005. Supervisor: A. Považanová
 - Peter Prikryl: *Random access machine with stored program simulator*. May 2005. Supervisor: M. Nehéz
 - Peter Sivák: *CSIDC 2005*. May 2005. Supervisor: M. Bieliková
 - Adam Skalný: *Adaptive hypermedia and programming courses*. May 2005. Supervisor: M. Bieliková

- Milan Skuhra: *Editor for algorithm creation working with strings*. May 2005. Supervisor: Z. Husárová
- Zdeno Slanický: *Programming teaching support using examples*. May 2005. Supervisor: M. Bieliková
- Vojtech Szöcs: *Adaptive Web and education of programming*. May 2005. Supervisor: M. Bieliková
- Michal Tvarožek: *CSIDC 2005* May 2005. Supervisor: M. Bieliková
- Mikuláš Vallo: *Heterogeneous Players properties utilisation*. May 2005. Supervisor: I. Kapustík
- Peter Vojtek: *Language observatory project in World Wide Web*. May 2005. Supervisor: V. Grlický
- Michal Žitňanský: *Creating specifications in Z Language*. May 2005. Supervisor: D. Komorová

Master (Ing.) Theses

- Michal Babala: *Digital graphical objects generation and recognition*. December 2006. Supervisor: A. Považanová
- Michal Biščo: *Semantic Web-based system for document management*. May 2005. Supervisor: R. Filkorn
- Tomáš Búci: *Use of probabilistic models with unobserved variables for data mining in textual databases*. December 2006. Supervisor: G. Kosková
- Ján Čúzy: *The player in simulated environment of RoboCup games*. December 2006. Supervisor: I. Kapustík
- Igor Dysko: *Specialisation patterns in program designing in Java language*. May 2005. Supervisor: P. Návrat
- Miroslav Gális: *Searching for the information and knowledge in Semantic Web*. December 2006. Supervisor: V. Grlický
- Marek Gregor: *Information support of spatial development processes*. December 2006. Supervisor: I. Kapustík
- Sergey Gorbachev: *Characteristics of mobile agents from different development environments*. May 2005. Supervisor: I. Kapustík
- Zuzana Halanová: *Information retrieval in Semantic Web*. December 2006. Supervisor: P. Návrat
- Martin Herchl.: *CRM utilization in e-business*. May 2005. Supervisor: J. Minárová
- Michal Holečka: *Extracting knowledge from a database*. December 2006. Supervisor: V. Šimáková
- Peter Horný: *Application of knowledge discovery in databases methods to banking*. May 2005 Supervisor: A. Bou Ezzeddine
- Michal Jakubík: *Virtual university – discussion forums*. December 2006. Supervisor: V. Šimáková

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- Michal Kelemen: *Digital video recorder*. December 2006.
Supervisor: V. Šimáková
 - Andrej Krištofič: *Discovery of knowledge about student behaviour during the process of learning to program*. May 2005. Supervisor: M. Bieliková
 - Ján Kudják: *Document sharing and access*. December 2006.
Supervisor: G. Kosková
 - Eudovít Lučenič: *Problem-oriented information system*. December 2006.
Supervisor: V. Šimáková
 - Ľubomír Majtás: *Catalogue of software knowledge*. December 2006.
Supervisor: R. Filkorn
 - Lukáš Matušík: *Digital assistant in the Semantic Web environment*.
December 2006. Supervisor: R. Filkorn
 - Katarína Matušíková-Uherková: *Personalized navigation in information space*.
December 2006. Supervisor: M. Bieliková
 - Ondrej Mikita: *Computer support of the processes of spatial planning by the scientific prototyping methodology*. December 2006. Supervisor: I. Kapustík
 - Emil Náhlik: *Integration of module for CT images management with information system NOCIS*. December 2006. Supervisor: V. Šimáková
 - Teodor Petrik: *Networks generation with properties of small world graphs – genetic algorithm utilization*. Supervisor: M. Nehéz
 - Szabolcs Puskás: *Discussion forum for system of Virtual University*.
Supervisor: V. Šimáková
 - Peter Ružička: *Graph-theoretical model of the collaboration networks*.
December 2006. Supervisor: G. Frivolt
 - Marián Sedláček: *Open source development and the World Wide Web*. May 2005.
Supervisor: P. Návrat
 - Adrian Slavkovský: *Specialization patterns in program design*. May 2005.
Supervisor: P. Návrat
 - Martin Spevák: *Usage of CRM in e-Business*. May 2005. Supervisor: J. Minárová
 - Štefan Sudolský: *Cooperation strategies in multiagent systems*. May 2005.
Supervisor: P. Návrat
 - Miloslav Šípka: *Support for feature modelling*. December 2006.
Supervisor: V. Vranič
 - Ján Šnirc: *Integrating feature modelling into UML*. December 2006.
Supervisor: V. Vranič
 - Martin Šoltis: *Transport tasks optimization*. December 2006.
Supervisor: A Bou Ezzeddine
 - Štefan Trgala: *Visualization of modules for the system of Virtual University*.
May 2005. Supervisor: V. Šimáková
 - Michal Tury: *Identification and management of ontology changes*.
December 2005. Supervisor: M. Bieliková

- Miroslav Vnuk: *Decompression of executable files*. December 2005.
Supervisor: P. Návrat
- Darina Záhradná: *Support for documents accessing*. May 2005.
Supervisor: Ľ. Hanulová
- Jaroslav Zajac: *RoboCup–team cooperation*. December 2005.
Supervisor: M. Lekavý

Doctoral (PhD.) Theses

Student name: Gabriela Kosková
Degree program: Program and Information Systems
Thesis title: Topographic Organization of User Preference Patterns in Collaborative Filtering
Supervisor: Pavol Návrat, Professor
Defended on: March 3, 2005
Annotation: Great number of information sources available in everyday life hampers effective identification of those that are likely to be of interest to the people. To overcome the problem of information overload, collaborative filtering techniques aim at recommending items of potential interest based on similarities in users' preferences. There has been published a large number of heuristic collaborative filtering algorithms. However those algorithms are not able to mine patterns hidden in the collaborative filtering data. Model-based latent class models were successfully used to extract hidden patterns in preference data. However, to understand the extracted patterns, one needs to manually inspect them, what might be very tedious process. In this thesis we introduce topographic versions of two latent class models for collaborative filtering. Latent classes are topologically organized on a square grid, star or spider-web structure. Topographic organization of latent classes makes orientation in rating/preference patterns captured by the latent classes easier and more systematic. We apply our system to a large collection of user ratings for films. The system can provide useful visualization plots unveiling user preference patterns buried in the data, without losing potential to be a good recommender model.

9.4 Research Laboratories

Intelligent Systems Laboratory

Head: P. Návrat
Contact: pavol.navrat@fiit.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 intelligent search, delivery, and presentation of heterogeneous information in a distributed environment such as Internet, including categorisation

and recommendation of the information. The laboratory is equipped with fairly powerful computer systems and advanced software tools that correspond to the demands of the projects being solved. The equipment is regularly renewed thanks mainly to continuous success in grants including international ones.

Advanced Software and Web Technologies Laboratory

Head: M. Bieliková

Contact: maria.bielikova@fiit.stuba.sk

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

9.5 Research projects

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

Project leader: M. Bieliková

Members: A. Andrejko, A. Bou Ezzeddine, R. Filkorn, I. Kapustík, G. Kosková, M. Lekavý, J. Minárová, L. Molnár, P. Návrat, I. Polický, V. Rozinajová, V. Vranič

Supported by: Science and Technology Assistance Agency of Slovak Republic

Duration: January 2005 – December 2007

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 (behavioral patterns, typical navigational destinations and sequences, etc.), while on the other side they are results of his social behavior 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.

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

- Project leader:* Institute of Informatics, Slovak Academy of Sciences (for STU: P. Návrat)
- Members:* M. Bieliková, A. Bou Ezzeddine, R. Filkorn, V. Imrecze, I. Kapustík, M. Lekavý, Ľ. Molnár, V. Rozinajová, V. Vranić
- Supported by:* Science and Technology Assistance Agency of Slovak Republic
- 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 multiagent 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 (CBR), a methodology for development of a library of cases for administrative processes has to be created. Also, appropriate algorithms for searching for case similarity have to be found. A case here represents a historical event which is characterised by the values of its attributes. This way it is possible to model experience of individual employees in maintaining their working activities. Each experience has to be captured in the context which includes employee, working task, needed documents, and contacts.

Collaborative Accessing, Analysis and Presentation of Documents in Internet Environment using Modern Software Tools (VEGA 1/0162/03)

- Project leader:* P. Návrat
- Members:* A. Andrejko, M. Bieliková, A. Bou Ezzeddine, R. Filkorn, G. Frivolt, V. Grlický, I. Kapustík, G. Kosková, M. Košík, J. Kuruc, M. Lekavý, V. Marko, Ľ. Molnár, M. Navarčík, M. Nehéz, I. Polický, V. Rozinajová, V. Vranić
- Supported by:* Scientific Grant Agency of the Ministry of Education of Slovak Republic and the Slovak Academy of Sciences
- Duration:* January 2003 – December 2005
- Description:* The focus of the project is on methods for intelligent information retrieval, categorisation and recommendations for using linguistic analysis, semantics of words and collaborative filtering. Valuable information can be obtained by nonlinear data analysis, such as multifractal scaling or data mining. We investigate new methods and techniques for development of application domain models, navigation models and content presentation models. The information about a user, his preferences, knowledge, goals and pattern of work together with the knowledge of environment is considered. Operation and usage of documents within the internet environment require an improvement in the area of modern software methods and tool, which

are employed for their implementation. Modern trends of software components systemisation and their reuse will be enriched by design patterns. A new quality is expected incorporating a modified version of collaborative software agents.

Learning Programming using Adaptive Hypermedia System on the Internet (KEGA 3/2069/04)

Project leader: M. Bieliková
Members: R. Filkorn, I. Kapustík, J. Kuruc, J. Minárová, P. Návrat, M. Nehéz, G. Kosková, A. Považanová
Supported by: Cultural and Educational Grant Agency of the Ministry of Education of Slovak Republic
Duration: September 2004 – December 2006
Description: The aim of the project is to improve e-learning methods and tools using adaptive web-based hypermedia. Our work is directed towards learning programming. We concentrate on design of architecture of adaptive educational web-based system together with techniques for adaptation of educational content presentation (e.g. level of detail presented to a student), adaptation of the layout and adaptive navigation. As a main source of adaptation we consider a student with various characteristics related to learning (e.g., level of knowledge, preferences, previous work with the system). We expect devising new methods and techniques for learning programming using Internet and development of adaptive web-based system for learning programming using several programming paradigms.

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: L. Molnár, P. Návrat, M. Šperka
Supported by: European Social Fund
Duration: December 2004 – December 2006
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 programmes realized at the Faculty of Informatics and Information Technologies, especially in software engineering. The project also includes financial support of PhD students in order to increase the number of young research workers with highest qualification.

Tools for Acquisition, Organisation, and Maintenance of Knowledge in an Environment of Heterogeneous Information Resources

Project leader: STU, P. Návrat
Members: UPJŠ Košice, UI SAV Bratislava, Softec s.r.o. Bratislava
Supported by: state programme of research and development “Establishing of Information Society”
Duration: September 2004 – November 2007

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.

Doctoral Education in Computing (ERASMUS – Thematic Network Project 114046-CP-1-2004-1-BG-ERASMUS-TN)

Project leader: STU, P. Návrat
Contractor: A. Smrikarov, Angel Kunchev University of Rousse, Bulgaria
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
Supported by: Socrates programme of the European Commission,
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 to develop the tools for doing this through analysis of the existing systems, exchanging experience 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 European Dimension in Higher Computing Education and Training.

European Community -Culture 2000 Programme CLT 2004/A1/IT SMART HISTORY

Project leader: Parco Cinque Terre – dott. Claire Marie O'Neill, STU – architecture: Eva Králová, new technology: P. Návrat
Contractor: The University of Florence, Italy
Countries: BE, IT, PL, SK, YU, UA
Supported by: European Community -Culture 2000 Programme
Duration: 2004 – 2005
Description: The project Smart History is a multidisciplinary project bringing together researchers and students of architecture, information technology, business, agriculture and environmental studies. It aims at developing the replicable model for preserving national parks suffering from overload of tourism which causes running down of original objects, production, landscape and ambience. The original exploitation of area is changing due to new economy and tourist industry. The Cinque Terre Park was selected as a representative for

establishing this model which will enable finding solutions for preserving a combination of cultural and agricultural heritage. A short time ago this park was listed as UNESCO monument of a high value. As such it is a great attraction for tourists. It is important to provide tourists with the right information and to facilitate their stay in Cinque Terre. At the same time it is important to preserve the original heritage.

9.6 Publications

Journals

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- FILKORN, R., NÁVRAT, P.: An Approach for Integrating Analysis Patterns and Feature Diagrams into Model Driven Architecture. In: *LNCS 2932 – SOFSEM 2005, 31st Conf. on Current Trends in Theory and Practice of Computer Science*. Springer-Verlag (2005), – pp. 372–375.
- FRIVOLT, G., BIELIKOVÁ, M.: Topology Generation for Web Communities Modeling. In: *LNCS 2932 – SOFSEM 2005, 31st Conf. on Current Trends in Theory and Practice of Computer Science*. Springer-Verlag (2005), – pp. 167–177.
- NÁVRAT, P., FILKORN, R.: A note on the Role of Abstraction and Generality in Software Development. In: *Journal of Computer Science*, – Vol.1, No.1, (2005), pp. 98–102.
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Conferences

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- BIELIKOVÁ, M., KURUC, J.: Sharing User Models for Adaptive Hypermedia Applications. In: *ISDA 2005, 5th International Conference on Intelligent Systems Design and Applications*. H. Kwasnicka, M. Paprzycki M. (Eds.), IEEE Computer Society Press, Los Alamitos, Wrocław, September 2005. – pp. 506–511.

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- BIGOŠ, M.: Accessing Text Databases Available on Web. In: *ISD 2005, 14th International Conference on Information Systems Development*. A.G. Nilsson et al. (Eds.), Karlstad, Sweden, August 2005. P. Návrat (supervisor), – pp.195–206
- BLŠTÁK, P., BIELIKOVÁ, M.: Specification of Web Applications Design in CASE Using UML and its Mapping to an Implementation Environment. In: *ISIM 2005, 8th International Conference on Information Systems Implementation and Modelling*. J. Zendulka (Ed.), Hradec na Moravici, Czech Republic, April 2005. – pp. 135–142.
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- FRIVOLT, G., BIELIKOVÁ, M.: An Approach for Community Cutting. In *RAWS 2005, 1st Int. Workshop on Representation and Analysis of Web Space*. V. Svátek, V. Snášel (Eds.), Prague, Czech Republic, September 2005. – pp. 49–54.
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- MATUŠÍKOVÁ, K., BIELIKOVÁ, M.: Support of Navigation in Open Information Spaces. In: *ITAT 2005, Information Technologies–Applications and Theory*. P. Vojtáš (Ed.), Račková dolina, Slovakia, September 2005. – pp. 371–380. (In Slovak)
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- NÁVRAT, P. (rev.): Knowledge-based information retrieval and filtering from the Web. (The Kluwer International Series in Engineering and Computer Science, SECS 746)/Aut: Abramowicz, W.: Kluwer Academic Publishers, Norwell, MA 2003. 320 pp. – In: *ACM Computing Reviews – Vol. 46, No. 2, 105-106 (2005)*
- NÁVRAT, P. (rev.): Developing semantic Web services. (Aut: Alesso H., Smith C. A. K. Peters, Ltd., 2004), – In: *ACM Computing Reviews – accepted for publishing*.

Books

- BIELIKOVÁ, M.: /ed./: Informatics and Information Technologies Student Research Conference 2005–IIT SRC. Bratislava, FIIT STU. – 263 pp.
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- GREGUŠOVÁ, D., DULAK, A., CHLIPALA, M., SUSKO, B.: *Information and Communication Technologies Law*. STU 2005. – 186 pp. (in Slovak)
- VOJTÁŠ, P., BIELIKOVÁ, M., CHARRON-BOST, B., SÝKORA, O.: /eds./: *SOFSEM 2005, Theory and Practice of Computer Science*, 31th Conference on Current Trends in Theory and Practice of Computer Science. Liptovský Ján, Slovakia, January 22–28, 2005 : proceedings. – Berlin; Heidelberg : Springer, 2005. – 428 pp. (Lecture Notes in Computer Science; 3381).
- MANNOVÁ, B., ŠALOUN, P., BIELIKOVÁ, M.: /eds./: Technologies for e-learning. Seminar proceedings, Prague, Czech Republic, ČVUT, 2005. – 75 pp. (In Czech)

9.7 Cooperation

Cooperation in Slovakia

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

International Cooperation

- Department of Computers, Czech Technical University, Prague, Czech Republic
- Institute of Information Systems, Faculty of Information Technologies, Technical University, Brno, Czech Republic
- Institute of Intelligent Systems, Faculty of Information Technologies, Technical University, Brno, Czech Republic
- Department of Computers, University of West Bohemia, Pilsen, Czech Republic
- Department of Computer Science, Technical University of Ostrava, Czech Republic
- Faculty of Informatics, Masaryk University, Brno, 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

- *I. Kapustík*: 4th Project meeting INTELCITIES-WP4, Brussels, Belgium, February 8-9, 2005
- *M. Bieliková*: Faculty of Information Technology, Brno University of Technology, Czech Republic, February 9, 2005
- *M. Bieliková*: Faculty of Informatics, Masaryk University, Brno, Czech Republic, February 22, 2005
- *I. Kapustík, M. Gregor, O. Mikita*: International Workshop on Cultural Landscapes and Tourism Management, Parco Nazionale delle Cinque Terre, Riomaggiore, Italy, February 22 – March 6, 2005
- *P. Návrat*: INQAAE Biennial Conference 2005, Wellington, New Zealand, March 28–April 4, 2005
- *E. Molnár*: 8th meeting of the Bureau of the Intergovernmental Council for the Information for All Programme, UNESCO House, Paris, France, April 3-6, 2005
- *M. Navarčík, P. Blšták, I. Dysko, A. Slavkovský*: Information Systems Implementation and Modelling ISIM'05, Hradec nad Moravicí, Czech Republic, April 18-21, 2005
- *E. Molnár*: UNESCO, Paris, France, April 12-28, 2005
- *P. Návrat*: Scientific Council of the Faculty of Information Technology, Brno, Czech Republic, May 11, 2005
- *M. Bieliková*: Czech Technical University in Prague, Czech Republic, May 13-14, 2005
- *P. Návrat*: Mapping External Quality Assurance in Central and Eastern Europe: A Comparative Survey, Poznan, Poland, May 28-29, 2005
- *J. Kuruc, V. Marko*: Microsoft Windows Server 2003, Microsoft IT Academy, Hradec Králové, Czech Republic, May 31 – June 3, 2005
- *E. Molnár*: SOCRATES Sub-Committee for Higher Education, Brussels, Belgium, June 1, 2005
- *P. Návrat*: 18th Accreditation Committee meeting, Piliscsaba, Hungary, June 1-3, 2005
- *V. Rozinajová*: International Conference on Computer Systems and Technologies CompSysTech'05, Varna, Bulgaria, June 17-19, 2005
- *M. Bieliková*: Technologies for e-learning, Prague, Czech Republic, June 16-17, 2005
- *E. Molnár*: Innovation Day, Brussels, Belgium, June 2, 2005
- *V. Rozinajová*: Professors excursion, Siemens AG, Berlin, Germany, July 3-7, 2005
- *J. Jakubík*: Microsoft TechEd 2005, Amsterdam, The Netherlands, July 5-8, 2005
- *P. Návrat*: Conference “Internationalisation of Accreditation”, Berlin, Germany, July 6-8, 2005
- *P. Návrat*: 19th International Joint Conference on Artificial Intelligence IJCAI'05, Edinburgh, United Kingdom, July 30 – August 6, 2005

- *P. Návrat*: E-learning conference and TN DEC meeting, Berlin, Germany, September 4-7, 2005
- *M. Bieliková*: Hypertext'05, Salzburg, Austria, September 5-10, 2005
- *G. Frivolt, I. Polický*: 1st International Workshop on Representation and Analysis of Web Space RAWS'05, Prague, Czech Republic, September 14-16, 2005
- *M. Bieliková*: Datakon 2005, Brno, Czech Republic, October 22-26, 2005
- *L. Molnár*: 172nd session of the Executive Board, UNESCO, Paris, France, September 12-29, 2005
- *P. Návrat*: Steering Committee for Higher Education and Research (CDESR) Council of Europe, Strasbourg, France, September 28-30, 2005
- *L. Molnár*: UNESCO's General Conference, 33rd session, Paris, France, October 5-14, 2005
- *M. Bieliková, I. Kapustík, L. Molnár, P. Návrat*, : Computer Science Education Workshop (CSEW'05), Býkov, Czech Republic, October 20–21, 2005
- *M. Bieliková, M. Adam, M. Barla, P. Sivák, M. Tvarožek*: ACM Student Research Competition, Prague, Czech Republic, November 11-12, 2005
- *I. Polický, R. Barlík, M. Bartošek, M. Desatník*: ACM International Programming College Contest, Budapest, Hungary, November 18-21, 2005
- *J. Jakubík*: *Objects 2005*, Ostrava, Czech Republic, November 23-26, 2005
- *M. Bieliková*: General meeting /assembly/ of the Czechoslovak IEEE section, Prague, Czech Republic, December 2-3, 2005
- *M. Bieliková*: Scientific council of the Faculty of Information Technology, Brno, Czech Republic, December 7, 2005
- *J. Jakubík*: Microsoft Windows 2003 Server training, Hradec Králové, Czech Republic, December 13-16, 2005

9.8 Membership in Professional Organisations and Societies

Slovak Professional Organisations and Societies

Mária Bieliková

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

Ludovít Molnár

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

Pavol Návrat

- Accreditation Commission of Slovakia (vice-chair, since 1999; chair, 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 IEE (member, since 1996; chair, since 1997)
- Slovak Society for Computer Science (member, since 1992)

Martin Nehéz

- Slovak Society for Computer Science (member, since 1998)

Valentino Vranić

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

International Professional Organisations and Societies*Mária Bieliková*

- Institute of Electrical and Electronic Engineers (member, since 1998; senior member since 2003)
- IEEE Computer Society (member, since 1997)
- Institution of Electrical Engineers (member, since 1998)
- Engineering Council, UK (registered Chartered Engineer, since 1998)
- Association for Computing Machinery (member, since 1998)
- 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)

Pavol Návrat

- American Association for Artificial Intelligence (member, since 1993)
- Association for Advancement of Computers in Education (member, since 1998)
- Institute of Electrical and Electronic Engineers (member, since 1996; senior member, since 1998)
- IEEE Computer Society (member, since 1996)
- Association for Computing Machinery (member, since 1998)
- International Federation for Data Processing (IFIP) (member of Technical Committee TC12 – Artificial Intelligence, since 1998)
- Institution of Electrical Engineers (member, since 1998; fellow, since 1998)
- Engineering Council, UK (registered Chartered Engineer, since 1998)
- Joint Conference on Knowledge-Based Software Engineering Series, standing Steering Committee (member, since 1998)

- Advances in Databases and Information Systems Conference Series, standing Steering Committee (member, since 1998)

Ludovít Molnár

- Institute of Electrical and Electronic Engineers (member, since 1991)
- ACM (member, since 1991)
- International Federation for Data Processing (IFIP) (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 2005 – participation of a student team in Central European Regional Contest in Budapest, Hungary (I. Polický: team coach)
<http://www.fiit.stuba.sk/acm/>
- ACM CZ Student Research Competition 2005, Prague, Czech Republic – participation of 1 student project (M. Bielíková: supervisor), finals, Prague, Czech republic (1st place)
- IEEE Computer Society International Design Competition (CSIDC 2005) – participation of a student team (M. Bielíková: mentor)
<http://www.fiit.stuba.sk/csdc/>
- ProFIIT 2005 – Programming Competition for Secondary School Students (G. Kosková: director)
<http://www.fiit.stuba.sk/ProFIIT/>
- RoboCup, Soccer Simulation League, Regional Tournament in Bratislava, May 26-27, 2005 – I. Kapustík: event director, M. Lekavý: event organiser
<http://www.fiit.stuba.sk/robocup/>
- IIT.SRC 2005 – Informatics and Information Technologies Student Research Conference, April 27, 2005 – V. Šimáková: organising committee chair, M. Bielíková: programme committee chair, P. Návrat, Ľ. Molnár, J. Minárová: members of programme committee
<http://www.fiit.stuba.sk/IIT.SRC/>
- Computing and Informatics (CAI) – P. Návrat: member of the editorial board
- Journal of Applied Mathematics and Computing (JAMC), ISSN 1598-5865 – M. Bielíková: member of the editorial board
- Bulletin of the Slovak Society for Computer Science – M. Bielíková: member of the editorial board
- ACM CZ Student Research Competition 2005 – M. Bielíková: member of steering committee
- SOFSEM 2005 – 31st Annual Conference on Current Trends in Theory and Practice of Informatics, January 22–27, 2005, Jánška dolina, Slovakia –

- M. Bieliková: member of steering committee, co-chair of programme committee,
P. Návrat: member of programme committee
- ISIM 2005 – 8th Int. Conf. on Information Systems Implementation and Modelling, April 19–21, 2005, Hradec nad Moravicí, Czech Republic – M. Bieliková, P. Návrat: members of programme committee
 - ZNALOSTI 2005, February 9-11, 2005, Stará Lesná, Slovakia – M. Bieliková, P. Návrat: members of programme committee
 - IADIS Virtual Multi Conference on Computer Science and Information Systems (MCCIS 2005) – Intelligent Systems and Agents – ISA2005, April 11-19, 2005 – P. Návrat, M. Bieliková: members of programme committee
 - ECDL 2005 – 9th European Conference on Research and Advanced Technology for Digital Libraries, September 18-23, 2005, Vienna, Austria – M. Bieliková: member of programme committee
 - RAAWS 2005 – Workshop on Recommender Agents and Adaptive Web-based Systems at the 5th International Conference on Intelligent Systems Design and Applications ISDA 2005 Conference, September 8-10, 2005, Wroclaw, Poland – M. Bieliková: member of programme committee
 - CIKM 2005 – ACM Fourteenth Conference on Information and Knowledge Management, October 31 – November 5, 2005, Bremen, Germany – M. Bieliková: member of programme committee
 - ITAT 2005 – Workshop on Information Technologies – Applications and Theory. September 20-25, 2005. Račkova dolina, Slovakia – M. Bieliková, P. Návrat: members of programme committee
 - DATAKON 2005 – Annual Conference on the Current Trends in Databases and Information Systems, October 22–25, 2005, Brno, Czech Republic – M. Bieliková: member of steering committee, member of programme committee
 - Technologies for E-Learning 2005. Prague, Czech Republic, June 17, 2005 – M. Bieliková: member of programme committee, member of organising committee
 - ISD 2005 – 14th Int. Conf. on Information Systems Development, August 14–17, 2005, Karlstad, Sweden – P. Návrat: member of programme committee
 - ADBIS 2005 – 9th East-European Conf. on Advances in Databases and Information Systems, September 12–15, 2005, Tallin, Estonia – P. Návrat: member of steering committee, P. Návrat, M. Bieliková: members of programme committee
 - The 3rd International Human.Society@Internet Conference 2005, Tokyo, Japan – P. Návrat: European PC Co-Chair for Web technologies, uses and ill effects of the Internet
 - ICSM 2005 – IEEE 21st International Conference on Software Maintenance, September 25–30, 2005, Budapest, Hungary – P. Návrat: member of programme committee
 - AKRR 2005 – International and Interdisciplinary Conference on Adaptive Knowledge Representation and Reasoning, June 15–17, 2005, Espoo, Finland – P. Návrat: member of programme committee

10 Regional Networking Academy

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Regional Networking Academy (RCNA FIIT STU) consists of two 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. 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 18 Local Cisco Networking Academies in the Slovakia and prepares students for CCNA and CCNP certification exams.

10.1 Staff

Director

Pavel Čičák, Associe Professor, CCNA, CCAI

Administrative department

Bieleková Alexandra

Instructor staff

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Igor Grellneth, PhD., CCNA, CCAI

Ján Hudec

Ladislav Hudec, Associate Professor

Katarína Jelemenská, PhD.

Margaréta Kotočová, Associate Professor, CCNA, CCAI

Dušan Malina

Peter Mesjar, CCNA, CCNP, CCAI

Engineering Staff

Dušan Bernát

10.2 Projects

- Solving the grant „Methods and resources for creating security and management of networking and mobile computer systems II, VG 1/0157/03“
- 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.

10.3 Publications

ČIČÁK, P., KOTOČOVÁ, M., GRELLNETH, I., MESJAR, P.: Cisco Certified Networking Professional (CCNP) – 4 steps to advanced networking skills. In: *ICETA 2005, 4th Int. Conference on Emerging e-learning Technologies and Applications*, F. Jakab, V. Fedák et al. (Eds). Košice, September 2005, Elfa. - pp. 453-455.

ČIČÁK, P., GRELLNETH, I., KOTOČOVÁ, M., MESJAR, P.: Evaluating the skills and knowledge of CNAP students. In: *ICETA 2005, 4th Int. Conference on Emerging e-learning Technologies and Applications*, F. Jakab, V. Fedák et al. (Eds). Košice, September 2005, Elfa. - pp. 461- 464.

10.4 Cooperation

Cooperation in Slovakia

- Technical University in Košice, Faculty of Electrical Engineering and Information Technology, Regional Cisco Networking Academy
- University of Žilina, Faculty of Management Science and Informatics, Regional Cisco Networking Academy
- Microsoft Slovakia Ltd.
- IBM Slovakia Ltd.
- HP Slovakia Ltd.
- Datalan Ltd.
- Tronet Ltd.
- Soitron Ltd.
- DITEC Ltd.
- BGS Ltd.
- Asset Ltd.
- CISCO Systems Ltd.
- GTEC Slovakia Ltd.

International Cooperation

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

12 FIIT Personnel

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