ANNUAL REPORT
2011

STU
FIIT

Contents

1   Message from the dean

The Report shows the current state the Faculty has achieved in education, research and cooperation with business partners. The reader can find the study programmes offered by the Faculty and the research projects realized at the Faculty.

This is the Report on elaboration of which "two deans participated". On December 1, 2012 ended the term of Prof. Ľudovit Molnár and the Academic senat of the Faculty has elected the new dean of the Faculty Assoc. Prof. Pavel Čičák, whose term has started on Decemebr 2, 2011.

The evaluation of the Long term strategy for the year 2011 showed that almost all goals for this year have been successfully achieved. It of course does not mean that we are satisfied with the current situation in our main activities in research and in education.

In research we achieved slight improvement in scientific publications, but we would like to have a better structure of the research outputs, mainly considering journal papers.

In education we made deeper innovation of our study program Computer Systems and Networks with respect to further merging Information and Communication technologies which resulted to the Study Program replacement by the Study Program Computer and Communication Systems and Networks. We believe that this innovation will lead to higher interest from the side of new students and it fulfils expectation from the side of ICT companies. We are proud that our graduates have no problem to find suitable job. Even more, there is the highest request of FIIT STU graduates from the side of companies within all Faculties in Slovakia.

The Report shows the results achieved in research that is of high priority at Faculty of Informatics and Information Technologies, Slovak University of Technology in Bratislava (FIIT STU). Interlink of research and education is not only declared but also documented by research activities of our students. Research results of our students were presented at the 7th Student Research Conference IIT.SRC 2011 organised by the Faculty.

I would like to let all who are not living here in Mlynska Dolina and cannot see a progress in development of the new building of FIIT STU to know that the building is coming to a final stage. We hope that we will start new academic year 2012/13 in this new building. Please keep us fingers!

Prof. Ľudovít Molnár	Assoc. Prof. Pavel Čičák
Dean of the FIIT STU	Dean of the FIIT STU

2 Faculty Management Bodies

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

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

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

2.1 Academic Senate of the Faculty

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

Members of the Academic Senate in 2011

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

> *Pavol Návrat, Professor*
> chair
> `chair@as.fiit.stuba.sk`
>
> *Katarína Jelemenská (till Oct. 2011)*
>
> *Ladislav Hudec (from Oct. 2011)*
>
> chair of the faculty section
>
> *Jaroslav Abaffy*
> chair of the student section

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

> Mária Hricová

Members of the faculty section of the Academic Senate
`staff@as.fiit.stuba.sk`

    Ján Hudec

    Ladislav Hudec, Assoc. Professor

    Daniela Chudá (till Oct. 2011)

    Michal Barla (from Oct. 2011)

    Miroslav Galbavý

    Katarína Jelemenská (till Oct. 2011)

    Dušan Bernát (from Oct. 2011)

    Pavol Návrat, Professor

    Juraj Štefanovič

    Peter Trúchly

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

    Jaroslav Abaffy

    Andrej Folgeton (till Oct. 2011)

    Jakub Ševcech (from Oct. 2011)

    Peter Pištek

    Veronika Štrbáková

Activities of the Academic Senate of the Faculty in 2011

The Academic Senate of the Faculty of Informatics and Information Technologies in 2011

– discussed the proposal of Rules for forming study plans, conditions for continuation of study and for regular completion of study, and took note of the proposed recommended study plans for each study programme as presented by the Dean,

– elected Pavel Čičák, Assoc. Professor as the candidate for the office of Dean for term 2011-2014 and subsequently nominated him to the Rector for approval,

– approved new vice-deans (Daniela Chudá, Assoc. Professor, Viera Rozinajová, Assoc. Professor, Ivan Kotuliak, Assoc. Professor and Tibor Krajčovič, Assoc. Professor), proposed 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.

<div align="right">

Prof. Pavol Návrat
Chair Academic Senate FIIT STU

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2.2 Dean

The Dean is the representative of the Faculty who manages, represents and acts on behalf of the faculty. The current Dean was elected by the Academic Senate of the Faculty in its meeting held on October 24, 2011 and appointed by the Rector to his office on December 2, 2011 for a four year office term Vice-Deans were approved by the Academic Senate in November 2011.

Dean and Vice-Deans up to December 1, 2011

Ľudovít Molnár, Professor
Dean
dean@fiit.stuba.sk

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

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

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

Tibor Krajčovič, Assoc. Professor
Vice-Dean for New Building Material Resources
vicedean_development@fiit.stuba.sk

Ivan Kotuliak, Assoc. Professor
Vice-Dean for Material Resources
vicedean_development@fiit.stuba.sk

Dean and Vice-Deans since December 2, 2011

Pavel Čičák, Assoc. Professor
Dean
dean@fiit.stuba.sk

Viera Rozinajová, Assoc. Professor
Vice-Dean for Research
vicedean_research@fiit.stuba.sk

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

Daniela Chudá, Assoc. Professor
Vice-Dean for Education
vicedean_education@fiit.stuba.sk

Tibor Krajčovič, Assoc. Professor
Vice-Dean for Services and Development
vicedean_development@fiit.stuba.sk

2.3 Scientific Board of the Faculty

Members of the Scientific Board in 2011

Chair of the Scientific Board

Ľudovít 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

Elena Gramatová, Assoc. Professor

Pavol Horváth, Professor

Ladislav Hudec, Assoc. Professor

Margaréta Kotočová, Assoc. Professor

Štefan Kozák, Professor

Tibor Krajčovič, Assoc. Professor

Ľudovít Molnár, Professor

Oliver Moravčík, Professor

Ján Murgaš, Professor

Pavol Návrat, Professor

Jiří Pospíchal, Professor

Gregor Rozinaj, Assoc. Professor

Peter Volauf, Assoc. Professor

External members

Milan Češka, Professor – Brno University of Technology

Ladislav Hluchý, Assoc. Professor – Institute of Inf., Slovak Academy of Sciences

Ivan Kalaš, Professor – Comenius University in Bratislava

Josef Kolář, Assoc. Professor – Czech Technical University in Prague

Karol Matiaško, Professor – University of Žilina

Jiří Šafařík, Professor – University of West Bohemia in Pilsen

Jaroslav Šušol, Assoc. Professor – Comenius University in Bratislava

Liberius Vokorokos, Professor – Technical University in Košice

Honourable members

Milan Kolesár, Professor

Activities of the Scientific Board of the Faculty in 2011

The Scientific Board of the Faculty of Informatics and Information Technologies in 2011:

–   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 2011/12 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),

–   endorsed members of the Board of Specialists for doctoral study programmes,

–   endorsed supervisors for doctoral study programmes (in accordance with the University Code),

–   discussed the habilitation thesis and results both educational and research presented by Dr. Daniela Chudá and Dr. Michal Čerňanský, and made decision to confer the scientific-pedagogical degree of "docent" in the field Applied Informatics,

–   discussed the habilitation thesis and results both educational and research presented by Dr. Viera Rozinajová and Dr. Valentino Vranić, and made decision to confer the scientific-pedagogical degree of "docent" in the field Software Engineering,

–   approved a committee and reviewers for the process of nomination of "professors" for Assoc. Prof. Gabriel Juhás

Prof. Ľudovít Molnár
Chair Scientific Board FIIT STU

2.4 Disciplinary Commission of the Faculty for Students

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

Members of the Disciplinary Commission for Students in 2011

Chair of the Disciplinary Commission of the Faculty for Students

Ladislav Hudec, Assoc. Professor

Members of the Disciplinary Commission of the Faculty for Students

Juraj Štefanovič, PhD.

Ivan Kapustík

Ľubomír Varga – student of the doctoral degree programme

Valéria Harvanová – student of the master degree programme

Matúš Michalko – student of the bachelor degree programme

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

3 Study

3.1 Undergraduate Study (Bc)

In 2011 three accredited study programmes with regular length three years were offered:

- *Informatics*
- *Computer and Communication Systems and Networks,* new programme since academic year 2009/10 which substitutes older programme Computer Systems and Networks
- *Computer Systems and Networks,* programme is only for students, which started their study in this programme.

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

Numbers of the full-time bachelor programme students

		1st year	2nd year	3rd year	4th year[1]
Academic year	2003/2004[1]	150	103	123	134
	2004/2005	333 (216/117)	112 (60/52)	95[1]	156
	2005/2006	344 (230/114)	262 (176/86)	91 (54/37)	92
	2006/2007	332 (221/111)	269 (192/77)	246 (163/83)	19
	2007/2008	290 (195/95)	272 (188/84)	266 (186/80)	1
	2008/2009	265 (181/84)	229 (159/70)	308 (215/93)	-
	2009/2010	291 (189/102)	169 (124/45)	244 (170/74)	-
	2010/2011	253 (172/81)	196 (143/53)	190 (141/49)	-
	2011/2012	444 (291/153)	173 (123/50)	198 (142/56)	-

Note: First number in parentheses refers to number students in study programme Informatics, second number refers to number students in study programmes Computer Systems and Networks or Computer and Communication Systems and Networks.

On the course we have 6 overseas students.

In June 2011 the students defended their bachelor theses and passed the final examination. The number of all graduates was 144. From it, there were 107 in study programme Informatics and 37 in study programme Computer Systems and Networks.

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[1] Only the students in study programme Informatics.

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

- *"Magna cum laude":* Pavol Bielik, Roman Burger, Peter Krátky, Ján Súkeník, Jakub Ševcech

- *"Cum laude":* František Kudlačák, Ján Laštinec, Štefan Mitrík, Ondrej Perešíni, Michal Tomlein

- *Dean's Award for Excellent Bachelor Thesis:* Pavol Bielik, Ondrej Perešíni, Ján Súkeník, Jakub Ševcech

- *Dean's Commendatory Letter for Bachelor Thesis:* Pavol Bielik, Michal Cádrik, Michal Fornádeľ, Martin Gajdoš, Pavol Knapek, Ján Laštinec, Rastislav Martinický, Ľudovít Mydla, Ondrej Perešíni, Ján Súkeník, Jakub Ševcech, Ivan Šimko, Karol Šutý

1 018 applicants took part in the entrance examination to bachelor study programmes (708 applicants for study programme Informatics, 310 applicants for study programme Computer and Communication Systems and Networks). 778 applicants were offered admission (526 Informatics, 252 Computer Systems and Networks), 444 out of them actually made use of it and were enrolled (291 Informatics, 153 Computer Systems and Networks).

3.2 Master Study (Ing)

In 2011, FIIT STU offered three accredited study programmes with regular length two or three years[2]:

- Software Engineering (SI),

- Computer and Communication Systems and Networks (CCSN),

- *Information Systems (IS).*

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

Numbers of the full-time master programme SI, CSN (CCSN), IS students

		all	SI	CSN or CCSN	IS	Informatics*
Academic year	2003/2004	151	-	-	-	151
	2004/2005	182	72	38	-	72
	2005/2006	231	119	73	39	-
	2006/2007	290	124	106	60	-
	2007/2008	326	141	113	72	-
	2008/2009	362	154	110	98	-
	2009/2010	394	160	128	106	-
	2010/2011	395	157	126	112	-
	2011/2012	355	155	100	100	-

Note: * Only the students in old study programme Informatics.

On the course we have one overseas student.

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[2] Three years for students who have not obtained their first degree in related field.

In these study programmes 164 students graduated in June 2011 (68 in Software Engineering, 53 in Computer and Communication Systems and Networks, 43 in Information Systems).

The following students were conferred awards for their excellent results:

– *"Magna cum laude":* Andrej Hopko, Marián Hönsch, Matej Krchniak, Martin Labaj, Dominik Macko

– *"Cum laude":* Peter Havrila, Miroslav Kaniansky, Eduard Kuric, Karol Rástočný

– *Dean´s Award for Excellent Master Thesis:* Andrej Hopko, Martin Labaj, Dominik Macko

– *Institute of Inf., Slovak Academy of Sciences Award for Excellent Master Thesis:* Peter Havrila, Marián Hönsch, Matej Krchniak Karol Rástočný

– *Tatra Bank Award for Excellent Master Thesis:* Martin Labaj

– *Dean's Commendatory Letter for Master Thesis*: Filip Burda, Andrej Fogelton, Peter Havrila, Andrej Hopko, Marián Hönsch, Dávid Chalupa, Martin Jačala, Matej Krchniak, Eduard Kuric, Martin Labaj, Dominik Macko, Peter Malečka, Ján Murányi, Juraj Nemeček, Aurel Paulovič, Karol Rástočný, Miroslav Siebert, Daniel Švoňava, Jakub Ukrop

180 applicants took part in an entrance examination to the master programmes. 168 students were offered admission, 145 out of whom were enrolled.

3.3 Doctoral Study (PhD)

Quality and number of doctoral students significantly influence the results obtained in research. We still observe an insufficient number of motivated 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 in recent years. In 2011 the number of applicants and accepted full-time doctoral students for the second time increased significantly. Number of applicants increased 1.5 times compared to year before last year and 5 times compared to the previous years. This is reflected also by the number of accepted doctoral students. We worked towards motivating students to finish their theses. This resulted to increased number of defended dissertation theses – from 3 last year to 13this year (most doctoral students who finished their study this year started doctoral study more than three years ago).

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

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Num of students	11	16	22	22	24	25	30	34	43	48

In 2011 following dissertations were defended:

– *Michal Barla*: Towards Social-based User Modeling and Personalization (Software Engineering, supervisor: Mária Bieliková, Professor)

– *Peter Bartalos*: Effective automatic dynamic semantic web service composition (Software Engineering, supervisor: Mária Bieliková, Professor)

–   *Anna Bou Ezzeddine*: Web Information Retrieval Inspired by Social Insect Behaviour (Applied Informatics, supervisor: Pavol Návrat, Professor)

–   *Ronald Dobai*: Test Generation for Asynchronous Sequential Digital Circuits (Applied Informatics, supervisor: Elena Gramatová, Associate Professor)

–   *Peter Drahoš*: A Photo-realistic Head Model for Real-time Animation (Software Engineering, supervisor: Martin Šperka, Associate Professor)

–   *Peter Kapec*: Knowledge-based software representation, querying and visualization (Applied Informatics, supervisor: Martin Šperka, Associate Professor)

–   *Majej Košík*: A Contribution to Techniques for Building Dependable Operating Systems (Software Engineering, supervisor: Jiří Šafařík, Professor)

–   *Alena Kovárová*: Special Interaction Approaches and their Impact on Usability (Applied Informatics, supervisor: Martin Šperka, Associate Professor)

–   *Ľubomír Majtás*: Contribution to the Creation and Recognition of the Design Patterns Instances (Software Engineering, supervisor: Pavol Návrat, Professor)

–   *Pavol Mederly*: Semi-automated Construction of Megessaging-based Enterprise Application Integration Solutions (Software Engineering, supervisor: Pavol Návrat, Professor)

–   *Attila Štrba*: Wireless Embedded Systems Powered by Energy Harvesting (Applied Informatics, supervisor: Tibor Krajčovič, Associate Professor)

–   *Jozef Tvarožek*: Bootstrapping a Socially Intelligent Tutoring Strategy (Software Engineering, supervisor: Mária Bieliková, Professor)

–   *Michal Tvarožek*: Exploratory Search in the Adaptive Social Semantic Web (Software Engineering, supervisor: Mária Bieliková, Professor)

In 2011 two accredited study programmes were offered:

–   *Applied Informatics*,

–   *Software Systems* (as an orientation in Software Engineering).

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

3.4 Student Conferences and Competitions

The Faculty organised and supported in 2011 several student competitions and conferences. The importance of involvement of the students in such events is very high. Students took active participation in various technical and research activities (co)organised by the Faculty. We are proud to list also successes of our students in national and international competitions organized outside our university.

Imagine Cup

–   2nd place, Slovak finals of the Imagine Cup 2011 competition: Pavol Bielik, Peter Krátky, Štefan Mitrík, Michal Tomlein: Move2Play, supervisor: M. Barla

–   advanced to the Imagine Cup 2011 Woreldwide Finals: Eduard Kuric, Vladimír Mihál, Karol Rástočný: Green Game, supervisor: M. Tvarožek

–   3rd place, Worldwide Finals, Game Design category: Eduard Kuric, Vladimír Mihál, Karol Rástočný: Green Game, supervisor: M. Tvarožek

IIT.SRC 2011 – Informatics and Information Technologies Student Research Conference
(to be mentioned in the following section in more detail)

NAG 2011 – national CISCO competition
– Michal Jarkovský – 1st place in category UNI

IAM Slovakia 2011
– the best bachelor/diploma project competition with Theme Internet as a Medium – Jakub Ševcech – 3rd place

CIG 2011 – Simulate Car Racing Championship
– 2nd place: Maroš Bednár, Adam Brček, Marek Briš, Marián Florek, Vojtech Juhász, Juraj Kosmeľ, Ivan Valenčík, supervisor: Peter Vilhan

Student Personality of the Year
– Karol Rástočný – 1st place in category Computer Science, Mathematical and Physical sciences

ACM SPY – Student Project of the Year Czech and Slovak Competition
– Pavol Bielik (supervised by M. Barla), Martin Labaj (supervised by M. Bieliková), Karol Rástočný (supervised by M. Tvarožek) were among the winners of the winners and presented their project in the ACM SPY 2011 Finals:

  • Pavol Bielik – 1st place in bachelor category
  • Martin Labaj – 4th place in master category
  • Karol Rástočný – 5th place in master category

IT Diploma Thesis of the year – Czech and Slovak Competition
– Marián Hönsch – 2st place in Information systems development category
– Andrej Fogelton – 2nd place in Enterprise Information Systems category

RoboCup, Soccer Simulation League
– Winners of the Slovak University of Technology RoboCup 2011, 3D Team JIM: Juraj Drahoš, Ivan Hujsi, Maroš Urbanec

TP Cup
– Best Team of the year 2011 winners: Ján Hudek, Ivan Pleško, Pavol Sokol, Michal Valluš: Adaptive proxy server: supervisor M. Barla

3.5 Awarded Theses

Excellent Bachelor Theses

Student name: Pavol Bielik
Thesis title: *Innovative Application within an International Competition*
Supervisor: Michal Barla, PhD.
Defended on: May 2011
Degree program: Informatics
Annotation: Throughout the last decade, there has been an alarming decrease in daily physical activity among both children and adults. Medical ex-

perts agree that physical activity is critical to maintaining fitness, reducing weight and improving health. Yet so many people have difficulty increasing and maintaining physical activity in everyday life. Our solution has been created within an international competition Imagine Cup 2011 and focuses on solving problem of sedentary lifestyle of the modern generation.We propose a solution which teaches a healthier lifestyle and motivates to participate in regular physical activity by a variety of motivational tools. In order to recognize and assess physical activity, we created an application for mobile phones that collects data from various sensors, such as accelerometer, GPS and GSM. We provide personalised mechanisms of activity recommendation to ensure regular exercise, as opposed to occasional outbursts of activity which are unhealthy and even harmful. Although our concept is suitable for every age group, we focused on children as they are most challenging to motivate. Apart from children, we strongly involve their parents, as they play a key role in achieving long-term improvements.

Student name: *Ondrej Perešíni*
Thesis title: *Reconfigurable Architecture for Hardware Encryption of Data*
Supervisor: Mária Pohronská
Defended on: May 2011
Degree program: Computer and Communication Systems and Networks
Annotation: The goal of this bachelor thesis was creation of a peripheral device, which could transparently encrypt and decrypt data on selected communication interface and protocol. Additional research is dedicated to cryptographic algorithms, their efficiency and severity level. Research continues with detailed analysis of microprocessors in terms of their speed, efficiency, availability and power consumption. Further analysis discusses about microprocessors of ATmega, Vinculum and ARM family with their abilities in combination with accessible development kits. This thesis also describes proposed design and implementation, which covers the whole area of analysis. Individual section is dedicated to the examination and test of correct device function. The section of technical documentation contains programming and user guide for basic device application. In the end of this thesis we present a plan of future development for improvement of security and functionality.

Student name: *Jakub Ševcech*
Thesis title: *Web-Page Annotation*
Supervisor: Mária Bieliková, Professor
Defended on: May 2011
Degree program: Informatics
Annotation: Nowadays different kinds of annotations are used for organising and providing information to their recipient. These annotations are created either manually or automatically by document readers. In this work we focus on automatic creation of annotations to Web pages. We talk about annotations as arbitrary information extending document whether by describing information contained in the document or by

adding some more enriching information. We analyze the known approaches for document annotation from different perspectives, for example, on the basis of whether the annotation is created manually by document users or automatically. We proposed a method for automatic creation of annotations to the keywords in the text in Slovak language. Created annotations are intended to provide a definition of unfamiliar words or additional information to potentially interesting words. Created annotations are adapted using implicit feedback from the user. We implement and verify the proposed method in an environment of learning framework ALEF developed in the Faculty of Informatics and Information Technology. Created annotations are stored in ALEF along with other types of annotations such as comments or tags created by students.

Excellent Master Theses

Student name: *Peter Havrila*
Thesis title: *Management Tools of MPLS Networks*
Supervisor: Margaréta Kotočová, Assoc. Professor
Defended on: May 2011
Degree program: Computer Systems and Networks
Annotation: This work deals with management of networks based on TCP/IP protocol stack in service provider environment. Systematical approaches based to network management on FCAPS model are presented with focus on change management in TCP/IP networks. This work then presents a conception of network management systems and usage of network management protocols with focus on SNMP protocol. This work then moves to description of service provider technologies with emphasis on BGP protocol, Multiprotocol Label Switching (MPLS), MPLS Virtual Private Services (VPN) and MPLS Traffic Engineering (MPLS TE). Then this work focuses on Quality of Service principles and Traffic Engineering principles and needs for a typical service provider. Second part of this document then specifies the requirements for SNMP based visualization tool HelloRouteSP that has an ambition to provide value added information regarding MPLS network. Based on provided specification a proof of concept application called HelloRouteSP was implemented that allowed access to logical topology visualization of TCP/IP networks and as an addition also visualize routing paths along MPLS core technology spectrum.

Student name: *Andrej Hopko*
Thesis title: *Classification of DNA Functional Regions Using Binary Tensor Decomposition*
Supervisor: Jakub Mažgut
Defended on: May 2011
Degree program: Information Systems
Annotation: Knowledge discovery is favorite and trendy approach for valuable knowledge retrieval, useful in science and commerce as well. Understanding of gene location in the genome and functional region construction of a gene represents such desired knowledge. Mining in

DNA sequence data is one among many approaches to pursue these objectives and we have chosen it. Goal of the whole diploma project is an analysis of decomposition techniques for binary tensors with consideration of DNA region classification domain. We proposed an innovative decomposition technique using an idea of approach considering both content and discrimination characteristics of binary tensors. We offer detailed design, derivation and implementation of such decomposition technique with algorithms supporting its experimental evaluation. We have experimentally verified data reduction properties of proposed decomposition technique on the generated date and real DNA data as well. Our knowledge discovery model thus showed its capabilities of supervised dimensionality reduction. We demonstrated an improvement towards the model we had started from. We think that in age of demand for more and more multilinear data processing this model has much to offer.

Student name:	*Marián Hönsch*
Thesis title:	*Virtual Community Detection in Vast Information Spaces*
Supervisor:	Michal Barla, PhD.
Defended on:	May 2011
Degree program:	Software Engineering
Annotation:	Thesis describes our work on identifying communities of individuals based on their interests while browsing the web. A user can belong to several communities at a~time, where each community represents parts of his interests. We assume that recommendations coming from such communities are more accurate than from communities based on a~whole user profile. We describe how to record and identify particular interests for each user. Interests evolve from analysis of the resources that the user has viewed in the past and are defined as cluster of keywords. To evaluate our approach we built articles recommender for a news portal. As recommender systems are tailored to the specific domain, we also adapted our approach slightly to better fit the news portal domain, which is highly dynamic and with frequent changes.

Student name:	*Matej Krchniak*
Thesis title:	*Genetic Programming on Graphics Processing Unit*
Supervisor:	Peter Trebatický, PhD.
Defended on:	May 2011
Degree program:	Software Engineering
Annotation:	Performance of central processing units is constantly increasing, but in the field of artificial intelligence it is not enough. In the effort of increasing effectiveness of calculation we may consider moving part of the computation on the graphics processing units, which now may have more than hundreds of processors. This work describes the basics of parallel computation on graphics processing units. Terminology described in this work form the basis of parallel computation on graphics processing units in CUDA and OpenCL. In the following part I am using genetic algorithm to solve specific problem on central processing unit and graphics processing units. The results of this work

describe how effective is executing on graphics processing units instead of central processing units. These evaluations provide information about which representation of genetic program is better suited for execution on graphics processing units.

Student name:	*Martin Labaj*
Thesis title:	*Recommendation and Collaboration Based on Implicit Feedback*
Supervisor:	Mária Bieliková, Professor
Defended on:	May 2011
Degree program:	Software Engineering
Annotation:	In the field of e-learning and open web, the identification of difficult and/or interesting parts of learning text can be useful feature for tasks like rewriting, showing where to focus or providing help to student adaptively. Methods which extract this information by directly interacting with the user for example by asking him to rate document fragments can lead to distraction while learning and require that users answer truthfully. In this work, we focus on implicit interest indicators, most importantly document scrolling and user's gaze. With these, we designed a method for identification of interesting fragments of document and tracking of fragments of web application. We proposed several scenarios for use of this method and evaluated some of them in experiment with 34 students of our faculty. Main contribution of this work is in the utilization of users' gaze in the web environment, in common settings and with only commodity hardware.

Student name:	*Dominik Macko*
Thesis title:	*VHDL Digital Systems Model Visualization*
Supervisor:	Katarína Jelemenská, PhD.
Defended on:	May 2011
Degree program:	Computer Systems and Networks
Annotation:	This project is focused on the problem of visualization of digital systems VHDL models and the display possibilities, existing design systems and visualizers can offer. For more detail, they are analyzed the visualizers, solved in diploma projects Visualization of VHDL model and Visualization of VHDL description. The project deals with the problem of VHDL model simulation and visualization of this simulation. The simulation visualization possibilities of the existing digital systems VHDL models simulators are analyzed. From the analysis of visualization problem, they are shown different possibilities of visualization environment design procedure. In the design, it is necessary to choose properly a VHDL description parser, a transient representation and a way of the simulation visualization of digital system VHDL model. The design and implementation of the extension to existing application VHDL Visualizer v5.0 are proposed. This extension is about the simulation and the visualization of this simulation. This visualization environment is also able to use some free external tools for functionality addition. Because of that, this visualizer also becomes the strong verification tool.

Student name:	*Karol Rástočný*
Thesis title:	*Semantic Web Navigation Based on Adaptive Views*
Supervisor:	Michal Tvarožek, PhD.
Defended on:	May 2011
Degree program:	Software Engineering
Annotation:	The difficulty of finding relevant information in the Web is increasing as web repositories grow in size. We proposed a novel approach for navigation in the Semantic Web, which helps users find relevant information and enables them to browse similar and/or related resources. We achieve this via view-based search within the Semantic Web using navigation in a two-dimensional graph, which has the advantage of visualizing dependencies between results. Typical tools for Semantic Web browsing that employ graph-based approaches has problems with readability and understandability. We address these problems via adaptive views, result clustering, facet marking, next action recommendation and zoom-based navigation. We realized a prototype of the proposed navigation approach in the Semantic Web by implementing it as a plug-in for the faceted browser Factic. We next evaluated our approach via several experiments with real-world users.

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

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

4 Research

4.1 Research Areas

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

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

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

–   intelligent information analysis and processing in large information spaces, e.g. the World Wide Web,

–   personalized context-aware information and knowledge retrieval and recommendation for the adaptive social semantic web,

–   methods for distributed information processing,

–   advanced methods and tools for software systems design, development and integration,

–   computer vision and computer graphics in virtual and augmented reality systems,

–   advanced methods of computational intelligence oriented to "echo state" neural networks, recurrent neural networks, evolutionary algorithms,

–   methods and tools for security and administration of network and mobile computer systems,

–   methods and tools for mobile computing,

–   formal specification and automated engineering tasks in the area of HW/SW co-design of the mobile computing systems,

–   security, reliability and fault tolerance in distributed computer systems and mobile computer networks,

–   methods for improvement of quality of service in the Next Generation Networks,

–   design of digital systems and embedded systems.

FIIT STU recognizes as part of its mission to serve the broader academic community in Slovakia and also internationally in promoting cooperation in relevant fields. In 2011 FIIT STU supported the Slovak ACM Chapter activities. FIIT STU supported also the publishing Bulletin "Information Sciences and Technologies" – a web based scientific journal, activity initiated and executed by the ACM Slovakia Chapter.

4.2 Scientific Activities

In the year 2011, FIIT STU has organised or co-organised several scientific events:

- scientific conference *Cognition and Artificial Life XI*,
- international scientific conference *SCCG 2011 – Spring Conference on Computer Graphics*,
- international scientific conference *ECBS-EERC 2011 – Eastern European Regional Conference on the Engineering of Computer Based Systems*,
- scientific conference *Znalosti 2011*,
- international scientific conference *SOFSEM 2011 – Annual Conference on Current Trends in Theory and Practice of Informatics*,
- scientific workshop *WIKT 2011 – Workshop on Intelligent and Knowledge Oriented Technologies*,
- international conference *ICETA 2011 – International Conference on Emerging E-Learning Technologies and Applications*,
- international workshop *GCCP 2011 – International Workshop on Grid Computing for Complex Problems*,
- scientific seminar *PAD 2011 – Czech and Slovak Seminar on Computer Architectures and Diagnostics*,
- regular scientific seminar on *Artificial Intelligence* (organized at FIIT STU),
- regular scientific seminar on *Vision and Computer Graphics* (FIIT STU),
- regular scientific seminar on *Personalized Web* (organized at FIIT STU).

The Faculty took part in providing technical and scientific programmes, especially through the work in programme committees of more than 40 conferences, mostly international:

- ACIIDS, Asian Conference on Intelligent Information and Database Systems,
- ADBIS, East-European Conference on Advances in Databases and Information Systems,
- ASEA, International Conference on Advanced Software Engineering & Its Applications,
- CEE-SET, Central and East European Conference on Software Engineering Techniques,
- CESCG, Central European Seminar on Computer Graphics,
- CompSysTech, International Conference on Computer Systems and Technologies,
- Cognition and Artificial Life, Annual Conference on Cognition and Artificial Life,
- CSSim, Interational Conference on Computer Modelling and Simulation,

- Datakon, Annual Conference on the Current Trends in Databases and Information Systems,
- DDECS, IEEE Symposium on Design and Diagnostics of Electronic Circuits and Systems,
- DSD, Euromicro Conference on Digital System Design,
- ECBS-EERC, Eastern European Regional Conference on the Engineering of Computer Based Systems,
- EJC, European Japanese Conference on Information Modelling and Knowledge Bases,
- ENASE, International Working Conference of Evaluation of Novel Approaches to Software Engineering,
- ETS, IEEE European Test Symposium,
- EWDTS, East-West Design &Test Symposium,
- GCCP, International Workshop on Grid Computing for Complex Problem,
- HT, ACM Conference on Hypertext and Hypermedia,
- ICETA, International Conference on Emerging E-Learning Technologies and Applications,
- ICNFI, International Conference on Networking and Future Internet,
- ICWE, International Conference on Web Engineering,
- INFORMATICS, International Scientific Conference on Informatics,
- ISMIS, International Symposium on Methodologies for Intelligent Systems,
- ITAT, Workshop on Information Technologies – Applications and Theory,
- KES-AMSTA, KES International Symposium on Agent and Multi-Agent Systems – Technologies and Applications,
- MCCIS-ISA, IADIS International Conference, Intelligent Systems and Agents Conference,
- MEMICS, Annual Doctoral Workshop on Mathematical and Engineering Methods in Computer Science,
- MENDEL, International Conference on Soft Computing,
- NWESP, International Conference on Next Generation Web Services Practices,
- PAD, Czech and Slovak Seminar on Computer Architectures and Diagnostics,
- S3T, International Conference on Software Service Semantic Technologies,
- SAMI, International Symposium on Applied Machine Intelligence and Informatics,
- SCCG, Spring Conference on Computer Graphics,
- SCLIT, Symposium on Computer Languages, Implementations, and Tools,
- SCO, Sharable Content Objects – E-learning Conference,
- SERA, International Conference on Software Engineering Research, Management and Applications,

- SMAP, International Workshop on Semantic Media Adaptation and Personalization,
- SNAA, Intertnational Workshop on Social Network Analysis and Applications,
- SNPD, International Conference on Software Engineering, Artificial Intelligence,
- SOFSEM, Annual Conference on Current Trends in Theory and Practice of Informatics,
- UMAP, International Conference on User Modelling, Adaptation and Personalization,
- VaMoS, International Workshop on Variability Modelling of Software-intensive Systems,
- WEBIST, International Conference on Web Information Systems and Technologies,
- WIKT, Workshop on Intelligent and Knowledge oriented Technologies,
- WIRSS, International Workshop on Web Information Retrieval Support Systems, IEEE/WIC/ACM International Conference on Web Intelligence,
- Znalosti, Annual Conference on Knowledge Acquisition, Representation and Exploitation.

In 2011, FIIT STU organised or co-organised several events aimed at exhibition of students' research work. Above all, the most important event was the 7th *Informatics and Information Technologies Students Research Conference – IIT.SRC 2011*, which was held on May 4, 2011.

IIT.SRC 2011 attracted 98 research papers from which 89 were accepted (11 bachelor, 53 master, 25 doctoral students as authors) submitted by 134 student authors, which bears as a consequence that roughly 13% of all students are actively engaged in research to the extent they are able to write a paper on it.

Papers were in two categories: full papers (further organized as researching solutions and developing innovative solutions) and extended abstracts.

The conference was organized in five sections:
- Information Processing,
- Web Technologies and Engineering,
- Computer Systems, Networks and Security,
- Software Engineering,
- Artificial Intelligence, Computer Graphics and Multimedia.

The Conference was opened by a keynote of Jiří Wiedermann (Institute of Computer Science of the ASCR, Czech Rupublic) titled Singularity: the day when computers outperform human intelligence.

The excellent student papers were awarded. The best paper award was conferred to:
- *category of doctoral students* – Peter Magula (An Extension of Stateless Wireless Ad hoc Networks Quality of Service Model, supervisor M. Kotočová)
- *category of master students* – Andrej Fogelton (Initialization of Multiple Objects Tracking using Flocking Behavior of KLT Features, supervisor M. Makula)

- *category of bachelor students* – Jakub Ševcech (Automatic Web Content Annotation, supervisor M. Bieliková)

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

- *Filip Burda* (Decreasing Packet Loss of VoIP Calls by Optimising Transport Network, supervisor M. Kotočová)

- *Pavol Bielik, Peter Krátky, Štefan Mitrík, Michal Tomlein* (Motivating Children to Increase Physical Activity by Means of Reward, supervisors M. Bieliková, M. Barla)

- *Tomáš Kramár* (Detecting Search Sessions Using Document Metadata and Implicit Feedback, supervisor M. Bieliková)

- *Ján Súkeník* (Solving of Image Similarity Puzzle – Singular Value Decomposition, supervisor P. Lacko)

- *David Chalupa* (Discovering the Ability of Graph Coloring Heuristics to Find Substructures in Social Networks, supervisor J. Pospíchal)

Besides the 89 papers presented at the conference in two poster sessions several accompanied events were organized

- *RoboCup* Exhibition, where students presented interesting results in simulated league both 2D and 3D; RoboCup is an attractive project with free participation, designed to support education and research in artificial intelligence, robotics and information technologies

- *TP-Cup* Showcase, where seven teams presented their projects; TP-Cup is a competition of master students' teams aimed at excellence in development information technologies solutions within two semester long team project module in master study programs.

IIT.SRC 2011 accompanying events included also programming competition, FiitaPixel – photo contest best pictures exhibition, game with a purpose tournament, Invent competition for inventive student works of applicative nature within the topics of the conference in two categories: Design a Mobile Application and Design an Application for a Better Worls, and technical presentations related to modern information technologies given by the IIT.SRC 2011 conference sponsors.

FIIT STU initiated in 2010 a join of two Czech and Slovak student competitions ACM CZ Student Research Competition organized by Czech ACM Chapter and Czech and Slovak Universities and Diploma Thesis Competition organized by IT company Profinit, which resulted to establishing

- *Czech ACM Chapter & Slovakia ACM Chapter Student Project of the Year Competition – ACM SPY*

in beginning of 2010. 2nd ACM SPY Finals were organized in October 2011 in Prague, where 5 best bachelor and 5 best master student projects from overall 99 project submitted by students from 13 Czech and Slovak universities were presented.

The project

- *Personalized Training Plan Recommendation and Activity Tracking for a Healthier Lifestyle* authored by our student Pavol Bielik (supervisor M. Barla) won the 1st place in bachelor category

- *Implicit Feedback Based Recommendation and Collaboration* authored by Martin Labaj (supervisor M. Bieliková) won the 4th prize in master category
- *Adaptive Views as a Mean for Exploratory Semantic Search* authored by Karol Rástočný (supervisor M. Tvarožek) won the 5th prize in master category.

In September 2011 we actively participated in "The Night of Researcher", event supported by European Commission. This event was organized in more than 150 European cities. Researchers in many countries prepared presentations from the field of science and research for the laic public.

We are proud of ten FIIT STU student teams who presented their interesting research projects to public:

- *Move2Play – urob krok pre svoje zdravie* – project, which attended the Slovak Finals of Imagine Cup 2011, Pavol Bielik, Peter Krátky, Štefan Mitrík, Michal Tomlein supervised by M. Barla, M. Bieliková,
- *Hand gestures to control your computer, it would be cool!* – Andrej Fogelton,
- *Play and help to create better Web* – Jakub Šimko, Michal Kompan, Balász Nagy,
- *Intelligent robotic footballers – can robots replace live footballers?* – Juraj Beláni,
- *Talking map* – Alena Kovárová, Viktor Meszáros,
- *Walking virtual FIIT* – project of virtual walk through the new FIIT building, Filip Hlaváček, Ján Hudec, Pavol Mešťaník, Matúš Novotný, Michal Palček, Ivan Polko supervised by A. Kovárová,
- *The Green Game: More Green More Fun* – Eduard Kuric, Vladimír Mihál, Karol Rástočný supervised by M. Tvarožek,
- *Computers as you do not know them* – Valéria Harvanová, Ondrej Perešíní, Mária Pohronská, Martin Vojtko,
- *The Simulated Car Racing Championship 2011* – Adam Brček, Marek Briš, Vojtech Juhász, Juraj Kosmeľ, Ivan Valenčík supervised by P. Vilhan,
- *The power of new Web* – Michal Holub, Ivan Srba, Dušan Zeleník.

4.3 Publications

Results of our research were published in 275 publications, which presents 6% increase in overall, however slight decrease in journal papers and books in comparison with 2010. 233 scientific contributions were published in conference proceedings, 72 out of which were published in reviewed proceedings of international conferences. 29 scientific contributions were published in scientific journals and we have authors (co-authors or editors) of 10 books or book chapters.

FIIT STU is a co-publisher of the international scientific journal "Computing and Informatics" (until 2001 Computers and Artificial Intelligence). Three faculty staff members, P. Návrat, V. Kvasnička and J. Pospíchal were active in the editorial team in 2011 – P. Návrat as an Associate Editor and V. Kvasnička, J. Pospíchal as members of Editorial Board. Moreover, the faculty participates in editorial boards of seven other scientific journals.

Number of publications in 2011	UAPI[3]	UISI	UPSS	FIIT
Books and parts of books published by international/national publisher	-/-	1/1	-/-	1/1
Scientific works published in international/national scientific journals	1/6	5/14	1/2	7/22
Scientific works published in international conference proceedings	22	31	19	72
Scientific works published in national or local conference proceedings	25	117	19	161
Conference proceedings editors	2	10	-	12
Books editors	3[*]	2[*]	-	5[*]
Published reviews	-	3	-	3

* 1 common publication

Overview of other most significant activities in 2011	UAPI	UISI	UPSS	FIIT
Membership in editorial boards of scientific journals	6	5	2	13
Membership in programme committees of international scientific conferences	7	35	13	55
Membership in programme committees of national or local scientific conferences	3	23	13	39
Membership in steering committees of scientific conferences	0	5	2	7

4.4 Research Projects

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

Projects of the Scientific Grant Agency of the Ministry of Education and the Slovak Academy of Sciences (VEGA) and of the Slovak Research and Development Agency (APVV) formed an essential form of research organisation and scientific projects funding at the FIIT STU. In 2011

- five VEGA projects were completed, four were progressed and seven new projects were prepared for funding in 2012-2015,

- two new APVV projects started, and one new project was prepared in cooperation with FEI STU and Slovak Academy of Sciences for funding in 2012-2015,

[3] UAPI – Institute of Applied Informatics
UISI – Institute of Informatics and Software Engineering
UPSS – Institute of Computer Systems and Networks

− three projects of the Cultural and Educational Grant Agency of the Ministry of Education of Slovak Republic (KEGA) were completed, one progressed and four projects were prepared for funding in 2012-2014.

Mentioned projects are described in reports of institutes presented in the following parts.

The Faculty under the leadership of P. Návrat and I. Kotuliak participated in two international projects.

Number of projects funded in 2011	UAPI	UISI	UPSS
VEGA[4]	3[*]	3	3[*]
KEGA	2	2	-
APVV	-	2	-
Other national projects	1	1	2
European Structural Funds	-	3[†]	2[†]
International projects	-	1	1
FIIT STU	**6**	**12**	**8**

[*][†] common projects

Overview of funds (in Eur)	UAPI	UISI	UPSS	SUM
VEGA	21 067	50 819	7 584	79 470
KEGA	26 287	36 833	-	63 120
APVV	-	42 249	-	42 249
Other national projects	5 000	3 000	7 500	15 500
European Structural Funds	-	83 913	-	83 913
International projects	-	-	7 044	7 044
FIIT STU	**52 354**	**216 814**	**22 128**	**291 296**

In 2011 two institutes of the Faculty (UPSS, UISI) together with six other institutes of the University, the Institute of Informatics Slovak Academy of Sciences and International Laser Centre completed the project

− SMART – Centre of Excellence for Smart Technologies, Systems and Services

approved within the call of the Agency of the Ministry of Education for the Structural funds of the European Union (ERDF) under the Operational Programme Research and Development with overall budget approx. 1 395 thousands Eur. The same team progressed continuing project SMART II with overall budget approx. 2 214 thousands Eur.

Institute of Informatics and Software Engineering participated in preparation of successful research project for Call of the ERDF Agency directed towards applied research in colla-

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[4] VEGA – Scientific Grant Agency of the Ministry of Education of Slovak Re-public and the Slovak Academy of Sciences,
KEGA – Cultural and Educational Grand Agency of the Ministry of Education of Slovak Republic,
APVV – Slovak Research and Development Agency

boration with industry. This project led by Gratex Ltd. was approved in 2010 for financing for period of 2011-2014 and started in 2011.

The projects are realized in our research laboratories (description can be found in the parts devoted to individual institutes). In 2011 the following laboratories were operated:

- Laboratory of Database Technologies, manager: M. Galbavý,
- Intelligent Systems Laboratory, manager: P. Návrat,
- Advanced Software and Web Technologies Laboratory, manager: M. Bieliková,
- Computer Networks Laboratory I, II, manager: P. Čičák,
- Embedded Systems Laboratory, manager: T. Krajčovič,
- Mobile Computing Laboratory, managers: M. Čerňanský, V. Vranić, I. Kotuliak,
- VLSI Design Laboratory, manager: J. Hudec,
- Digital Systems Description and Design Laboratory, manager: K. Jelemenská,
- Grid Computing Laboratory, manager: L. Hudec.

<div align="right">

Prof. Mária Bieliková
Vice-Dean for Research

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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, guaranties 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 24 secondary schools. In 2011 our faculty organized Cisco NAG 2011 contest. One of the very successful activities is yearly organised Open Day of the Faculty.

5.2 Cooperation with Industry

Cooperation with industry is oriented towards training and consultation activities and educational cooperation. One of the new activities of the year was establishing "The Week of the Faculty and Partner Companies Cooperation".

Training and Consultation Activities

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

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

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

The Week of the Faculty and Partner Companies Cooperation

With the aim of improving cooperation with praxis the Faculty continued in a new form of cooperation with partner companies established in 2009. We organized one week serial of special lessons provided by our industry partners for our students. The second annual set of this activity was successful especially thanks to the following companies:

- Alcatel-Lucent Slovakia, a. s.
- Cisco Systems Slovakia, spol. s. r. o.
- Hewlett-Packard Slovakia, s. r. o.
- Microsoft Slovakia, s. r. o.
- Oracle Slovensko, spol. s. r. o.
- Softec, spol. s. r. o.
- Soitron, a. s.

Educational Cooperation

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

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

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

5.3 Mobility programmes

FIIT STU is using the cooperation within the mobility programme LLP/Erasmus. In year 2011, this programme was contracted with these European universities:

- KaHo Sint-Lieven University, Gent, Belgium
- Angel Kunchev University of Rousse, Bulgaria
- Faculty of Information Technologies, Technical University in Brno, Czech Republic
- University of Southern Denmark, Odense, Denmark
- University of Aarhus, Denmark
- Tallinn University of Technology, Estonia
- Lahti University of Applied Sciences, Finland
- EPITA, Graduate School of Computer Science and Advanced Technologies, Paris, France
- ISEP, Graduate school of Engineers in Computer Engineering, Electronics, Telecommunications and Network, Paris, France

- The Nordakademie, Elmshorn, Germany

- Ruhr-University, Bochum, Germany

- Leipzig University, Germany

- Wienna University of Technology, Austria

- Faculty of Electrical Engineering and Computer Science, University of Maribor, Slovenia

- Faculty of Engineering, Mondragón University, Spain

- Technical university of Madrid, Spain

- Catalunya Technical University, Barcelona, Spain

- University of Alcalá, Spain

- Växjo University, Sweden

- University of Calabria, Italy

In 2011, seven incoming Erasmus students have visited FIIT STU. In 2011, 32 students of our faculty were approved for Erasmus-mobility abroad for various destinations, 8 students were hosted by our faculty and 6 teachers have visited France, Great Britain and Belgium. Besides the LLP/Erasmus agreements, a special agreement of cooperation is established with the Institut Superieur d'Electronique de Paris (ISEP).

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

Juraj Štefanovič, PhD.
Socrates Erasmus Coordinator

6 Faculty Services

6.1 Slovak Informatics Library

Academic Senate of the faculty approved on April 9, 2010 the incorporation of the Slovak Informatics Library in the organizational structure of the faculty as a faculty department. Dean subsequently established the Slovak Informatics Library using the certificate of incorporation with effect from May 1, 2010.

Slovak Informatics Library was established on at the Faculty of Informatics and Information Technologies, Slovak Technical University in Bratislava in response to the faculty needs for research and training of experts in the field of informatics and information technologies for knowledge-based economy and for building an inclusive information society in Slovak Republic. The library is the central library to work with the scientific and professional literature in computer science and information technologies in the Slovak Republic. This library extends the scope of previous library at FIIT STU from faculty level to nationwide level.

Library:

– stores and registers qualification theses,

– is a workplace for central evidence of faculty publications and their references,

– provides acquisition services, books lending services and interlibrary loans,

– provides consultations and search services for teaching staff, researchers, all-time and external students of faculty and for other professional public.

The library catalogue contains more than 7 000 items, which are freely available in the Library. The catalogue can be found on `http://olib.cvt.stuba.sk`. The Library purchased and acquired thanks to donation 38 titles of professional journals (mainly ACM, IEEE membership) in various languages (5 out of them are in Slovak). Journals are located in the Study Room.

Electronic services are available mainly through these databases: ACM Digital Library, IEEE/IET Electronic Library, Springer Link, Science Direct, Scopus, ISI Web of Knowledge, Wiley Online Library which are the part of a national project NISPEZ.

The Library cooperates with other faculty libraries of the Slovak Technical University, and with Slovak Centre of Scientific and Technical Information.

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

The faculty computer network is based on a structured cable system and it is using 100 Mbps transfer speed. It consists of approximately 200 personal computers and notebooks of the faculty staff and PhD. students, 250 personal computers and workstations in the education and research laboratories and 30 specialized servers.

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

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

Ľubica Palatinusová
Faculty Secretary

7 Institute of Applied Informatics

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

The institute specializes in the area of applied informatics. The scientific and professional activities of the institute concentrate mainly on the area of computational intelligence (neural networks, evolutionary algorithms, artificial life, simulation of social systems), in application of computer graphics in virtual reality systems and in systems of enhanced reality, in visualization and human – computer interaction, in grid and parallel computing, in mobile computing (development of applications for mobile computing), and in computer and information security.

The institute is responsible for the following degree programme:

– Applied informatics (doctoral degree).

7.1 Staff

Director
Ladislav Hudec, Assoc. Professor

Deputy Director
Vladimír Kvasnička, Professor

Administrative Department
Katarína Pribišová

Teaching Staff
Vanda Benešová, PhD.
Michal Čerňanský, Assoc. Professor
Miroslav Galbavý
Peter Kapec, PhD.
Vladimír Kvasnička, Professor
Matej Makula, PhD. (part time)
Jiří Pospíchal, Professor
Viliam Solčány, PhD. (part time)

Branislav Steinmüller (part time)
Martin Šperka, Assoc. Professor (part time)
Juraj Štefanovič, PhD.
Peter Trebatický, PhD.

Researchers
Peter Drahoš, PhD.
Alena Kovárová, PhD.

Full time PhD Students
Jakub Breier
Ladislav Clementis
Andrej Fogelton
David Chalupa
Michal Kobza
Michal Kottman
Miroslav Makýš
Peter Marko
Juraj Pálfy
Juraj Števek
Jakub Ukrop
Ľubomír Varga
Peter Vilhan

7.2 Teaching

Undergraduate Study (Bc.)

Course	Semester	Credits	Lecturer
Algebra and Discrete Mathematics	Autumn	6	V. Kvasnička, J. Pospíchal
Human-Computer Interaction	Autumn	6	V. Benešová
Database Systems	Spring	6	M. Galbavý
IT Security Management	Spring	5	O. Strnád
Mathematical Logic I	Spring	6	V. Kvasnička
Operating Systems	Autumn	6	V. Solčány
Parallel Programming	Autumn	6	M. Čerňanský
Modelling and Simulation	Autumn	6	J. Štefanovič

Master Study (Ing.)

Course	Semester	Credits	Lecturer
Cognitive Science	Spring	6	V. Kvasnička
Machine Learning	Autumn	6	J. Pospíchal
Multimedia Computer Systems	Spring	6	M. Šperka
Evolutionary Algorithms	Spring	6	J. Pospíchal

Course	Semester	Credits	Lecturer
Neural Networks	Autumn	6	M. Čerňanský
Operating Systems Design	Spring	6	J. Štefanovič
Architecture of Computer Systems	Autumn	6	L. Hudec
Security of Computer Systems	Autumn	6	L. Hudec
Security in Internet	Spring	6	L. Hudec
Security and Management of Information Systems	Autumn	5	O. Strnád

7.3 Theses

Bachelor (Bc.) Theses – graduates 2011

Study Programme Informatics

- Baďura, Filip: *Interactive Presentation for Visual Experience.*
  Supervisor: J. Štefanovič

- Biely, Richard: *CPU Image Processing.* Supervisor: O. Hirjak

- Boleček, Tomáš: *Multimedia Applications for the iPhone.*
  Supervisor: M. Čerňanský

- Cádrik, Michal: *Solving Sudoku with the Rules of Logic.* Supervisor: V. Kvasnička

- Drahoš, Jakub: *The Support of Creating Schedule and Executing Exams.*
  Supervisor: M. Galbavý

- Fandl, Matej: *Multimedia Application for iPhone.* Supervisor: M. Čerňanský

- Fornádeľ, Michal: *Visualization of Photographic Data in Three Dimensional Space.*
  Supervisor: Ľ. Varga

- Forus, Samo*: Remote Desktop Supervision.* Supervisor: B. Steinmüller

- Franta, Martin: *Traffic Incidents Editor in Web Map Environment.*
  Supervisor: M. Galbavý

- Gajdoš, Martin: *Optimization of Navigation in Three Dimensional Action Game.*
  Supervisor: Ľ. Varga

- Havrila, Vlastimil: *Generating of Devil-Level Sudoku.* Supervisor: J. Pospíchal

- Ilko, Michal: *Optimization of Intelligent Transport Systems.* Supervisor: J. Cigánek

- Ivanec, Peter: *Automated Deployment of Typographic Elements.*
  Supervisor: O. Trebatická

- Jaroszewicz, Kazimír: *Video Poker.* Supervisor: Ľ. Varga

- Jašš, František: *GPU Image Processing.* Supervisor: O. Hirjak

- Jurčák, Ondrej: *Visual People Detection Using a Smart Camera.*
  Supervisor: V. Benešová

- Kislan, Tomáš: *The Use of System Engineering Tools in Creating Timetables.*
  Supervisor: M. Galbavý

− Košický, Martin: *Tool for Creating Shader Programs in Web Environment*. Supervisor: P. Drahoš

− Kubis, Viliam: *Generating Documentation from Source Code*. Supervisor: P. Kapec

− Kuka, Radovan: *Stereo Methods of Three-Dimensional Reconstruction (Stereo Vision)*. Supervisor: V. Benešová

− Kukuča, Jozef: *Implementation of OCR on a Smart Camera*. Supervisor: V. Benešová

− Mačuga, Peter: *Generating Devil Sudoku*. Supervisor: J. Pospíchal

− Mydla, Ľudovít: *Analysis of Speech*. Supervisor: P. Drahoš

− Neslušanová, Lenka: *Image Processing*. Supervisor: M. Makula

− Petráš, Daniel: *System for Realization Marathons in Programming*. Supervisor: P. Trebatický

− Petruľák, Martin: *Multimedial Application for Operating System Android*. Supervisor: O. Hirjak

− Poizl, Dušan: *Simulation of Cellular Automata on Graphic Processing Units*. Supervisor: V. Solčány

− Polakovič, Patrik: *OpenCL Module for Lua Language*. Supervisor: P. Drahoš

− Sedláček, Andrej: *Web Application for iPhone*. Supervisor: M. Čerňanský

− Slotík, Igor: *Visual People Detection Using a Smart Camera*. Supervisor: V. Benešová

− Stopka, Martin: *Implementation of MIP Projection on Graphical Processing Units*. Supervisor: V. Solčány

− Šimko, Ivan: *Generating Documentation from Source Code*. Supervisor: P. Kapec

− Švarc, Jaroslav: *Module GLEW for Lua Language*. Supervisor: P. Drahoš

− Tehlár, Filip: *Virtual Museum*. Supervisor: J. Štefanovič

− Tekeľ, Gabriel: *Learning Tools for Relational and Object Databases*. Supervisor: M. Galbavý

− Tóth, Juraj: *Remote Desktop Oversight*. Supervisor: B. Steinmüller

− Vacula, Matúš: *Editor of Three-Dimensional Objects for Web*. Supervisor: P. Drahoš

− Vinarčík, Jaroslav: *Capturing 3D Position of Objects in Space*. Supervisor: P. Drahoš

− Zimová, Zuzana: *Comparison of the Suitability of Different Paradigms for the Problem from Artificial Intelligence*. Supervisor: Ľ. Varga

Study Programme Computer and Communication Systems and Networks

− Hreha, Martin: *Penetration Testing of WLAN*. Supervisor: L. Hudec

Study Programme Computer Systems and Networks

− Kujan, Jozef: *Security of Operating System Linux*. Supervisor: L. Hudec

Master (Ing.) Theses – graduates 2011

Study programme Information Systems

- Brandobúr, Marek: *Finding Connections in Public Transport Networks using Massive Parallelism*. Supervisor: M. Čerňanský

- Clementis, Ladislav*: Sudoku Puzzle Solution by using Simulated Annealing*. Supervisor: V. Kvasnička

- Čaučík, Martin: *Source-Code Management Based on Language Constructs*. Supervisor: P. Kapec

- Dávid, Michal: *Connection GPS with the Transport Information Systems*. Supervisor: M. Galbavý

- Chnúrik, Jaroslav*: Programming Language for SIMD Programming*. Supervisor: V. Solčány

- Juhas, Matúš: *Creation Methods of Neural Network Structure*. Supervisor: J. Cigánek

- Kacera, Miroslav*: Interactive Presentation in Virtual Reality*. Supervisor: J. Štefanovič

- Lojan, Tomáš: *Monitoring, Data Acquisition and Administration of High-Level Behaviour.* Supervisor: L. Hudec

- Mikuška, Peter: *The Support of Timetable Creation in Multiagent Environment*. Supervisor: M. Galbavý

- Mindek, Peter: *Data Visualization Using Metaphors Inspired by Visualization of Biological Processes*. Supervisor: P. Kapec

- Pružinský, Matej: *Solving a Sudoku Game using Genetic Algorithm.* Supervisor: V. Kvasnička

- Števaňák, Samuel: *Interactive Learning Using Mobile Device*. Supervisor: A. Kovárová

- Švajdlenka, Robert: *Route Planning in Public Transport Networks Using Massive Parallelism.* Supervisor: M. Čerňanský

- Voroňák, Peter: *Intelligent Image Resizing*. Supervisor: A. Kovárová

Study Programme Software Engineering

- Božík, Peter: *Hand Gesture Recognition*. Supervisor: M. Makula

- Časnochová, Hana: *Neuro Fuzzy Structure Dynamic System Modelling in Energetics.* Supervisor: P. Trebatický

- Číková, Zuzana: *Use of Query Languages and Magic Lenses in Graph Visualization*. Supervisor: P. Kapec

- Fogelton, Andrej: *Hand Tracking*. Supervisor: M. Makula

- Holic, Peter: *Optimization of Initialization Parameters of Dynamic Reservoir in the Echo State Neural Networks for Different Types of Tasks*. Supervisor: M. Makula

- Chalupa, David: *An Evolutionary Algorithm for Class Optimization*. Supervisor: J. Pospíchal

- Jurský, Stanislav: *Evolutionary Solving of Nonograms*. Supervisor: J. Pospíchal
- Kallo, Ondrej: *Simulation and Visualization of Turbulences in Air Flow Near Obstacles*. Supervisor: P. Drahoš
- Kaniansky, Miroslav: *Content Based Image Retrieval*. Supervisor: V. Benešová
- Kindernayová, Monika: *Interactivity Exhibition of Museum in Augmented Reality in a Playful Way.* Supervisor: J. Štefanovič
- Krchniak, Matej: *Genetic Programming on Graphics Processing Unit.* Supervisor: P. Trebatický
- Lauro, Tomáš: *Interactive Control of Applications using Sign Language.* Supervisor: J. Štefanovič
- Lulčo, Michal: *Hybrid Evolutionary Algorithm for Graph Coloring Optimization.* Supervisor: J. Pospíchal
- Mardiak, Marek: *Optimization of Spatial Coordination of Agents by Evolutionary Concepts.* Supervisor: J. Pospíchal
- Martinka, Vladimír: *Application of Constraint Monitoring Agents to Multiagent Environment for Automated Timetabling.* Supervisor: M. Galbavý
- Ondriga, Lukáš: *Application Control through Camera Interface.* Supervisor: J. Štefanovič
- Pajbach, Michal: *Interactive Control with Mobile Phone.* Supervisor: J. Štefanovič
- Palo, Dušan: *Simulation and Visualization of Fluids in Three-Dimensional Space.* Supervisor: P. Drahoš
- Paprčka, Michal: *Smart Camera Motion in 3D Graphs.* Supervisor: P. Kapec
- Pažitnaj, Adam: *Visualization of Data in Time.* Supervisor: P. Kapec
- Sokolský, Michal: *Three Dimensional World of Solid Geometry.* Supervisor: A. Kovárová
- Sopko, Róbert: *Personalized Interactive Education through Mobile Devices.* Supervisor: A. Kovárová
- Švoňava, Daniel*: Efficient Representation of Graphs.* Supervisor: P. Trebatický
- Ukrop, Jakub*: Presentation of Embedded Graph Data.* Supervisor: P. Kapec

Study Programme Computer Systems and Networks

- Mészáros, Viktor*: Application for Supporting Common Learning Methods in Classrooms with Use of Indirect Control.* Supervisor: A. Kovárová
- Mrekaj, Peter*: Creation of Parallel Applications for Multicore Architectures of Parallel Computer Systems.* Supervisor: M. Čerňanský
- Pristaš, Peter: *PUSH Technology and its Deployment in Mobile Platform.* Supervisor: P. Vilhan
- Šugarek, Ján: *Forensic Tools for Collection of the Digital Evidence for Windows.* Supervisor: L. Hudec
- Ubreži, Ľudovít: *The Use of Security Mechanisms of Database Environment in Information Systems.* Supervisor: M. Galbavý

–   Žiak, Slavomír: *Push Technology as Means of Real-Time Notification and Synchronization of Mobile Clients*. Supervisor: P. Vilhan

Doctoral (PhD.) Theses

Student name:	Peter Kapec
Degree program:	Applied Informatics
Thesis title:	*Knowledge-Based Software Representation, Querying and Visualization*
Supervisor:	Martin Šperka, Assoc. Professor
Defended on:	April 7, 2011
Annotation:	In the recent years information visualization became very important as it allows us to gain insight into large amounts of data. Better information comprehension can be obtained by observing graphical representations of data, which may reveal hidden patterns. Among various data types that can be visualized, software is a suitable candidate due to software's intangibility. In our work we focused on the visualization of software artifacts and their interconnections. We propose a software visualization method that uses a hypergraph-based data model as a unifying representation that is used in the whole visualization process: from artifacts extraction and representation, trough filtering and querying to visualization. Inspired by the knowledge representation field we propose a modified hypergraph-based representation that enhanced by incidences that are suitable to represent roles objects play in relations. We also propose a query language in which queries and query results are hypergraphs, thus making the approach transparent for visualization. The visualization of the hypergraphs representing the extracted software artifacts and their relations is based on the well known force-based graph layout algorithms. The proposed method was implemented in a software visualization prototype and verified by visualizations of an existing software project.

Student name:	Alena Kovárová
Degree program:	Applied Informatics
Thesis title:	*Special Interaction Approaches and their Impact on Usability*
Supervisor:	Martin Šperka, Assoc. Professor
Defended on:	September 26, 2011
Annotation:	The present work examines various interaction styles. It is divided into three parts, introducing three proposals for enhancement of existing interaction methods. The rst proposal focuses on applying the common hardware to a new style of interaction -the interaction with objects in the outdoor environment. To verify this method we have implemented the pilot system icPoint, which enables the user to interact with a night sky. The second proposal relates to the streamlining of the information retrieving from the Internet. We propose a method for accelerating this process. It is based on the user model utilization. In order to verify this method we have implemented a widget, which assists in searching for departure times of public transportation. We have achieved considerably better times in obtaining the requested information. The third part deals with the enhancement of a graphic user

interface for educational 3D graphical editors, where we focus mainly on a preview hint visualized before an action is executed. This preview shows the consequence of the user's potential action. To verify our theory we have implemented a simulation of the cube cross section. Tests performed by users demonstrated that this preview is a useful and desired element of the interface.

Student name:	Peter Drahoš
Degree program:	Software Engineering
Thesis title:	*A Photo-realistic Head Model for Real-time Animation*
Supervisor:	Martin Šperka, Assoc. Professor
Defended on:	September 30, 2011
Annotation:	In the recent years the average performance of computers increased significantly partly due to the ubiquitous availability of graphics hardware. Photorealistic rendering of human faces is no longer restricted to offline rendering and use in movies. Even portable machines and to some degree high-end mobile devices offer enough performance to synthetize photorealistic facial animation in real time. However, the unavailability of flexible and reusable animation systems for use in third party applications still remains an issue. Our work presents a straightforward approach to photorealistic facial animation synthesis based on dynamic manipulation of displacement maps. We propose an integrated system that combines various animation sources such as blend-shapes, virtual muscles and point influence maps with modern visualization and skin simulation techniques. Inspired by systems that synthetize facial expression from images we designed and implemented an animation system that uses image based composition of displacement maps without the need to process the facial geometry. This improves overall performance and makes implementation of detail scalability trivial. For evaluation we have implemented a reusable animation library that was used in a simple application that visualizes speech.

7.4 IIT.SRC Students' Papers

Full papers

- Clementis, Ladislav: *Solving Sudoku Puzzle Using Simulated Annealing.* Supervisor: V. Kvasnička

- Fogelton, Andrej: *Initialization of Multiple Objects Tracking using Flocking Behavior of KTL Features*. Supervisor: M. Makula

- Chalupa, David: *Discovering the Ability of Graph Coloring Heuristics to Find Substructures in Social Networks*. Supervisor: J. Pospíchal

- Kallo, Ondrej: *Simulation and Visualization of Turbulences in Flow around the Obstacles.* Supervisor: P. Drahoš

- Kobza, Michal: *Graph-Based Language for Plan Controlled Agents in Real-Time Simulation Environment*. Supervisor: J. Pospíchal

- Kottman, Michal: *Planar Object Detection Using Local Feature Descriptors.* Supervisor: V. Benešová

- Lauro, Tomáš: *Interactive Control of Application Using Multi-touch Gestures.* Supervisor: J. Štefanovič

- Mardiak, Marek: *Optimization of Spatial Coordination of Agents by evolutionary Concepts.* Supervisor: J. Pospíchal

- Mindek, Peter: *Visual Artefacts Removal in Volumetric Visualization.* Supervisor: P. Kapec

- Mydla, Ľudovít: *Word Boundary Detection Method Robust Against Plosives in Speech.* Supervisor: P. Drahoš

- Pajbach, Michal: *Interactive Control with Mobile Phone.* Supervisor: J. Štefanovič

- Pálfy, Juraj: *Classification of Repetitions Using Support Vector Machines.* Supervisor: J. Pospíchal

- Pidanič, Pavol – Števek, Juraj: *Handouts in Linear Approximation: Neural etwork Approach.* Supervisor: Š. Kozák

- Varga, Ľubomír: *Path Planning in Spatial Graph with Negative Cycles.* Supervisor: V. Kvasnička

- Vilhan, Peter – Marko, Peter: *10 Minutes Approach for Better Network Security.* Supervisor: L. Hudec

Extended abstracts

- Bednár, Maroš – Brček, Adam – Briš, Marek – Florek, Marián – Juhász, Vojtech – Kosmeľ, Juraj – Valenčík, Ivan: *The Modular Architecture of an Autonomous Vehicle Controller.* Supervisor: P. Vilhan

- Ondriga, Lukáš: *Synergetic Collaboration of 2D and 3D Interfaces.* Supervisor: J. Štefanovič

TP CUP Competition

- Budzel, Matej – Mihálik, Martin – Podstrelenec, Matej – Šilhár, Dárius – Zálešák, Vladislav: *Interactive Viewer of a Furniture Catalogue.* Supervisor: J. Štefanovič

- Čorba, Miroslav – Hašto, Branislav – Lipka, Lukáš – Lipták, Matej – Pipík, Roman: *mPay – New Way of Mobile Banking.* Supervisor: M. Čerňanský

- Hlaváček, Filip – Hudec, Ján – Mešťaník, Pavol – Novotný, Matúš – Palček, Michal – Pečík, Rastislav – Polko, Ivan: *The Conjunction of Spatial Navigation and Information Systems through Virtual Reality.* Supervisor: A. Kovárová

7.5 Research Laboratories

Laboratory of Database Technologies

Manager: M.Galbavý
Contact: `miroslav.galbavy@stuba.sk`
Description: The laboratory is oriented towards support of research tasks, which use in some stages of solution a database environment, or deal with security issues of information systems. Further application is in data-

base application including multimedia applications, Global Information Systems, on-line transaction processing, on-line analytical processing, data-mining, data warehouses, internet access to data-bases, applications of CASE systems. It si equipped with SUN Enterprise 250 server and tens of SunRay workstations, some PC's and software including Oracle, PostgreSQL, MS SQL Server, Progress.

Mobile Computing Laboratory

Manager:	M. Čerňanský (UAPI), I. Kotuliak (UPSS), V. Vranić (UISI)
Contact:	`michal.cernansky@stuba.sk`
Description:	The main purpose of the laboratory is to support research and teaching process related to mobile computing. Laboratory supports research and student projects from multiple domains that can greatly benefit from mobile computing technology such as computer vision, computer graphics, machine learning and augmented reality. Currently the laboratory equipment consists of several iOS mobile phone and tablet PC devices (Apple iPhone, Apple iPad) and computers used for development applications for mobile devices. In near future laboratory will be equipped with devices running Android (Google), Symbian OS (Nokia) and eventually other major mobile computing platforms (Windows Phone 7, RIM Blackberry, Samsung Bada).

Grid Computing Laboratory

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

7.6 Research Projects

Security and reliability in distributed computer systems and mobile computer networks (VEGA, 1/0649/09)

Project leader:	L. Hudec
Supported by:	Scientific Grant Agency of the Ministry of Education of Slovak Republic and the Slovak Academy of Sciences
Duration:	January 2009 – December 2011
Description:	Project deals with new methods and tools development for security and reliability implementation in distributed computers systems and mobile computer networks. Distributed system is presented by grid systems (clusters). The project solves the creation of real time grid

system with reliability enhancement by means of standard operating system and the implementation of secure access control to grid resources by means of certificates. The last solved field in distributed environment is modular method for permanent or intermittent fault diagnostics. The diagnostic method is based on the knowledge of algebraic Petri net model of system, whereas the model is extended to probabilistic and time parameters. The mobile computer network is presented by wireless mobile ad hoc network. The project solves the problem of node failure, packets losses and end-to-end communication interruption from the point of communication reliability.

Study of emergence of strategies by neural networks (VEGA 1/0141/10)

Project leader:	J. Pospíchal
Members UAPI:	V. Kvasnička, P. Trebatický, Ľ. Varga, M. Kobza, J. Pálfy
Supported by:	Scientific Grant Agency of the Ministry of Education of Slovak Republic and the Slovak Academy of Sciences
Duration:	January 2010 – December 2011
Description:	The project from the area of distributed artificial intelligence will study emergence of strategies of multiagent systems, where single agents have their cognitive organ implemented by a neural network. Agents, placed in a given environment, must adapt to carry out prescribed activities (avoidance of obstacles, games, cooperation, ethnic conflicts, communication, and emergence of social structures). Neural network will be taught by reinforcement (reward/punishment) method. Activity of agents will be evaluated only after a longer time delay, when an external evaluator will be able to classify their behaviour as successful or unsuccessful. The proposed method will allow a systematic change of weight coefficients of neural networks in such a way that the successfulness of their activities will progressively grow.

Robust MPC for Hybrid Systems (RPHS) (VEGA 1/1105/11)

Project leader:	Š. Kozák
Members UAPI:	M. Čerňanský, M. Makýš, J. Števek
Supported by:	Scientific Grant Agency of the Ministry of Education of Slovak Republic and the Slovak Academy of Sciences
Duration:	January 2011 – December 2013
Description:	The last five years are marked by an increased interest in development of new control methods for heterogeneous hybrid process that include continuous and discrete dynamics. Research in control methods for hybrid non linear dynamic systems represent a new evolution trend in development and application of control algorithms that help considerably improve performance of complex technological processes within a wide spectrum of applications (power industry, car industry, health care, biotechnologies, transportation, service industry). Those advanced methods apply principles and methods of prediction, robustness, optimality and embeddedness. The main objective of the project is research and development, algorithmization and implementation of robust predictive control methods for non linear hybrid processes us-

ing modem information, communication and centrol technologies and systems realized by embedded computer systems.

Integration of study of processing visual information and creating complex educational multimedia materials (KEGA 068UK-4/2011)

Project leader:	V. Benešová
Supported by:	Cultural and Educational Grant Agency of the Slovak Republic (KEGA) Ministry of Education SR
Duration:	January 2011 – December 2013
Description:	The main goals of the project are: (i) redaction of all courses in the field of Visual Information Processing on both universities with the aim of conformity of their sylabus, (ii) new modern textbook in the Slovak language – this is the most important deliverable of this project. A teaching textbook for courses in the field of "Digital Image processing" and "Computer vision" is still missing in slovak language, (iii) Multimedia teaching materials inclusive exercises on DVD and online platform, (iv) English-Slovak glossary of tech. terms in these fields, which currently lacks a frequently used English version dates.

Support for Parallel and Distributed Computing Education (KEGA 244-022STU-4/2010)

Project leader:	M. Čerňanský
Members UAPI:	L. Hudec, P. Kapec, P. Drahoš, M. Makula, D. Bernát, A. Kovárová, M. Kottman, O. Hirjak, V. Benešová, V. Solčány,
Supported by:	Cultural and Educational Grant Agency of the Slovak Republic (KEGA) Ministry of Education SR
Duration:	January 2010 – December 2011
Description:	Project aim is to improve the ability of high school students to get use of methods and apparatus of parallel and distributed computing. The goal is to support education process of parallel and distributed processing on high schools programs by creating course materials and other supplementary documents related to high school educational process. Popularization of modern trends in parallel and distributed processing is also considered.

Design of applications for mobile devices (NTB 2010et016)

Project leader:	M. Čerňanský
Members UAPI:	M. Čerňanský, P. Trebatický, P. Drahoš, V. Solčány, A. Kovárová
Supported by:	Tatra banka foundation – E-talent
Duration:	January 2011 – December 2011
Description:	The main goal of the project is to support faculty activities related to mobile computing. Faculty laboratory will continue to provide hardware for student projects from the field of mobile computing and students projects from public transportation and mobile payment domains will be supported.

7.7 Publications

Journals

BABINEC, Š. - POSPÍCHAL, J.**:** Modular Echo State Neural Networks in Time Series Prediction. In: *Computing and Informatics*. Vol. 30, No. 2 (2011), ISSN 1335-9150, pp. 321-333.

CHALUPA, D.: On the Ability of Graph Coloring Heuristics to Find Substructures in Social Networks. In: *Information Sciences and Technologies Bulletin of the ACM Slovakia.* Vol. 3, No. 2 (2011), ISSN 1338-1237, pp. 51-54.

FOGELTON, A.: Real-time Hand Tracking using Modified Flocks of Features Algorithm. In: *Information Sciences and Technologies Bulletin of the ACM Slovakia.* Vol. 3, No. 2 (2011), ISSN 1338-1237, pp. 37-41.

KAPEC, P.: Knowledge-based Software Representation, Querying and Visualization. In: *Information Sciences and Technologies Bulletin of the ACM Slovakia.* Vol. 3, No. 2 (2011), ISSN 1338-1237, pp. 1-11.

LACKO, P. - STEINMÜLLER, B. - BIELIKOVÁ, M.: Distributed Computing or New Computer Cluster at FIIT STU. In: *Spektrum*. Vol. 17, No. 7 (2011), ISSN 1336-2593, pp. 14-15. (in Slovak)

KVASNIČKA V. - CÁDRIK M.: Logical Model of Sudoku. In: *Čs. čas. fyz*. 61 (6) (2011) 349-355. (in Slovak)

International Conferences

BREIER, J. - HUDEC, L.: Risk Analysis Supported by Information Security Metrics. In: *CompSysTech'11*. Proceedings of the 12th International Conference on Computer Systems and Technologies Vienna, Austria. New York ACM Press, 2011, pp. 393-398.

CHALUPA, D.: Population-based and Learning-based Metaheuristic Algorithms for the Graph Coloring Problem. In: *Genetic and Evolutionary Computation Conference*. GECCO'11, 2011 Dublin, Ireland. New York ACM, 2011, pp. 465-472.

DRAHOŠ, P.: Facial Expression Composition Using Dynamic Displacement Mapping. In: *Spring Conference on Computer Graphics SCCG 2011 in Cooperation with ACM and Eurographics*. Galbov Mlyn, Viničné, Conference Proceedings, Comenius University Bratislava, Slovakia, 2011, pp. 45-52.

FLOCHOVÁ, J. - HOLLÝ, J. - ZAPATICKÝ, M. - PIVARČEK, J.: Model based Implementation of Supervisors and Diagnosers in VHDL Code of Programmable Systems. In: *EUROCON 2011*. Int. Conf. on Computer as a Tool Joint with CONFTELE 2011, Lisbon, Portugal. Los Alamitos IEEE Computer Society, 2011, pp. 90-92.

FOGELTON, A.: Real-time Hand Tracking using Flocks of Features. In: *CESCG 2011 proceedings of the 15th Central European Seminar on Computer Graphics*. Viničné, Slovakia, Vienna University of Technology, 2011, pp. 107-114.

GRELLNETH, I. - HRUBÝ, M. - VILHAN, P.: Emulating Cisco Network Laboratory Topologies in the Cloud. In: *ICETA 2011*. 9th IEEE International Conference on Emerging eLearning Technologies and Applications, Stará Lesná, The High Tatras, Slovakia. Proceedings, IEEE, 2011, pp. 67-92.

CHALUPA, D.: An Optimization Strategy Based on Social Insect Behavior. In: *SOFSEM 2011*: *Student Research Forum*. Nový Smokovec, Slovakia, 2011, pp. 35-50.

KOBZA, M.: Adaptive Decision Making and Controlling in Distributed Environment. In: *SOFSEM 2011*: *Student Research Forum*. Nový Smokovec, Slovakia, Okat, 2011, pp. 67-82.

KOVÁROVÁ, A. - SOKOLSKÝ, M.: Using Virtual Reality for Teaching Solid Geometry: A Case Study for a Cube Section. In: *ICL 2011*. 14th International Conference on Interactive Collaborative Learning and 11th International Conference Virtual University, Piešťany, Slovakia, IEEE, 2011, pp. 428-433.

KOVÁROVÁ, ALENA - POLÁK, MAREK: Virtual Reality Interaction via Mouse Gestures. In: *Spring Conference on Computer Graphics SCCG 2011 in cooperation with ACM and Eurographics*, Galbov Mlyn, Viničné April 28-30, 2011: Conference Materials and Posters, Bratislava: Comenius University, 2011, pp. 43-46.

KOVÁROVÁ, A. Special Interaction Approaches and their Impact on Usability. *Information Sciences and Technologies Bulletin of the ACM*, Slovakia, Vol. 3, No. 3 (2011), pp. 14-25.

KOZÁK, Š. - ŠTEVEK, J.: Improved Piecewise Linear Approximation of Nonlinear Functions in Hybrid Control. In: *IFAC World Congress*. Proc. of the 18th IFAC World Congress 2011, Milano, Italy. Oxford IFAC, 2011, pp. 14982-14987. (on-line)

MAKÝŠ, M. - KOZÁK, Š.: Effective Method for Design of Traffic Lights Control. In: *IFAC world congress*. Proceedings of the 18th IFAC World Congress 2011, Milano, Italy, Oxford IFAC, 2011, pp. 14934-14939. (online)

MAKÝŠ, M. - KOZÁK, Š.: Modeling and Control Methods for Hybrid Systems. In: *PEIT'011*. New Paradigms in Electronics and Information Technologies, 1st International Conference. Alexandria, Egypt, Cairo ERI, 2011. CD-ROM.

MAKÝŠ, M. - KOZÁK, Š.: Hybrid Methods for Traffic Lights Control. In: *Process Control 2011*. Proceedings of the 18th International Conference. Tatranská Lomnica, Slovakia, Bratislava STU, 2011, pp. 64-71.

MINDEK, P. - KAPEC, P.: Graph Visualization Using the Mataphor of Biological Neural Nets. In: *Spring Conference on Computer Graphics SCCG 2011 in Cooperation with ACM and Eurographics*. Galbov Mlyn, Viničné, Slovakia, Conference Proceedings, Comenius University Bratislava, 2011, pp. 169-175.

MINDEK, P.: Maximum Intensity Projection Weighed by Statistical Cues. In: *CESCG 2011*. Proceedings of the 15th Central European Seminar on Computer Graphics, Viničné, Slovakia, Vienna University of Technology, 2011. pp. 149-155.

PÁLFY, J. - POSPÍCHAL, J.: Recognition of Repetitions Using Support Vector Machines. In: *SPA 2011*. Signal Processing Algorithms, Architectures, Arrangements, and Applications Conf. Proceedings Poznan, IEEE Poland Section, 2011, pp. 79-84.

PETRÍK, M. - KOZÁK, Š.: Prediction of Critical Processes in Nuclear Power Plant Using Genetically Trained Neural Networks. In: *Process Control 2011*. Proceedings of the 18th International Conference, Tatranská Lomnica, Slovakia STU, 2011, pp. 77-84.

ŠIDLA, O. - KOTTMAN, M. - BENEŠOVÁ, V.: Real-time Pose Invariant Logo and Pattern Detection. In: *Proceedings of SPIE*. Vol. 7878, Intelligent Robots and Computer ision, Algorithms and Techniques, San Francisco, CA, USA, 2011. (online)

ŠTEVEK, J. - KOZÁK, Š.: Computer Aided Control System Design (CAPCS). In: *PEIT'011*. New Paragigms in Electronics & Information Technologies, 1st International Conference. Alexandria, Egypt, Cairo ERI, 2011. CD-ROM.

ŠTEVEK, J. - KOZÁK, Š.: Matlab Toolbox for PWA Identification of Nonlinear Systems. In: *Process Control 2011*. Proceedings of the 18th International Conference. Tatranská Lomnica, Slovakia, Bratislava STU, 2011, pp. 111-118.

ŠTEVEK, J. – KOZÁK, Š.: Fuzzy control in Xenta systems by Schneider Electric (in Slovak). *iDB Journal*, no. 2, vol. 2011, pp. 24-26, 2011.

Selected Local and National Conferences

CLEMENTIS, L.: Solving Sudoku by Simulated Annealing. In*: Cognition and Artificial Life XI*. Silesian University in Opava, Czech Republic 2011, pp. 49-52. (in Slovak)

KOBZA, M.: Decentralised Coordination by Communication Que. In: *Cognition and Artificial Life XI*. Silesian University in Opava, Czech Republic 2011, pp. 93-100. (in Slovak)

KVASNIČKA, V. - POSPÍCHAL, J.: Solving Sudoku by a Binary System of Linear Equations. In: *Cognition and Artificial Life XI*. Silesian University in Opava, Czech Republic 2011, pp. 105-114. (in Slovak)

LACKO, P. - KVASNIČKA, V.: Neural Networks Used for Board Game Play. In: *Artificial Intelligence and Cognitive Science III*. Bratislava STU, 2011, pp. 117-162. (in Slovak)

PÁLFY, J.: Ann and SVM Based Recognition of the Dysfluencies of Speakers with Stuttering. In: *MENDEL 2011*. 17th International Conference on Soft Computing. University of Technology, Brno, Czech Republic 2011, pp. 440-447.

PÁLFY, J.: Window to Recognition of Stuttering. In: *Cognition and Artificial Life XI*. Silesian University in Opava, Czech Republic 2011, pp. 191-196. (in Slovak)

POSPÍCHAL, J.: About Complexity of Measuring Complexity. In: *Artificial Intelligence and Cognitive Science III*. Bratislava STU, 2011, pp. 221-229. (in Slovak)

POSPÍCHAL, J.: Evolutionary Approach to Collatz Problem. In: *MENDEL 2011*. 17th International Conference on Soft Computing. University of Technology, Brno, Czech Republic 2011, pp. 56-61.

STRNÁD, O. - GALBAVÝ, M. - WALTERSTEIN, V.: Application of E-learning in Education in Information SEcurity. In: *Konferencia "Informačná bezpečnosť"*. Proceedings, Congress Center Technopol, Bratislava SASIB, Slovak Republic 2011, pp. 79-84. (in Slovak)

ŠTEVEK, J. - KOZÁK, Š.: PWA System Identification with Strong Nonlinearities. In: *Selected Topics on Constrained and Nonlinear Control*. Preprints. Bratislava STU v Bratislave, 2011, pp. 249-263.

VARGA, Ľ. - KVASNIČKA, V.: Path Planning in Spatial Graphs. In: *Cognition and Artificial Life XI*. Silesian University in Opava, Czech Republic 2011, pp. 287-292.

Book Editors

KELEMEN, J. - KVASNIČKA, V. - POSPÍCHAL, J.: Cognition and Artificial Life IX. Silesian University in Opava, Czech Republic, 2011, ISBN 978-80-7248-644-1, 299 p. (in Slovak)

KVASNIČKA, V. - POSPÍCHAL, J. - NÁVRAT, P. - LACKO, P. - TREBATICKÝ, P.: Artificial Intelligence and Cognitive Science III, Bratislava STU, 2011, ISBN 978-80-227-3542-1, 385 p. (in Slovak)

7.8 Cooperation

Cooperation in Slovakia

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

International Cooperation

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

Visits of Staff Members

- *W. Benešová, J. Štefanovič:* Visual Computing Trends 2011, Vienna, Austria, January 26, 2011

- *V. Kvasnička:* Faculty of Information Technology, Brno University of Technology, Czech Republic, February 25, 2011
- *M. Čerňanský, P. Trebatický:* Forum Nokia QtQuick for Mobile training, Budapest, Hungary, March 3-4, 2011
- *J. Pospíchal, J. Pálfy:* Mendel 2011, Brno, Czech Republic, June 15-17, 2011
- *M. Čerňanský:* Windows Phone - Mango Workshop, Prague, June 29, 2011
- *D. Chalupa:* GECCO 2011, Genetic and Evolutionary Computation Conference, Dublin, Ireland, July 11-17, 2011
- *M. Makýš, J. Števek:* 18th IFAC World Congress, Milano, Italy, August 30 - September 3, 2011
- *W. Benešová:* Czech Technical University, Erasmus mobility Prague, Czech Republic, September 8-30, 2011
- *J. Pálfy:* SPA 2011, Signal Processing: Algorithms, Architectures, Arrangements and Application, Poznan, Poland, September 28 - October 1, 2011
- *A. Kovárová:* Gaudeamus 2011, Brno, Czech Republic, November 3-4, 2011
- *L. Hudec:* GRIFO 2011, Mikulov, Czech Republic, November 7-8, 2011
- *L. Hudec:* The Institution of Engineering and Technology, Stevenage, United Kingdom, November 21-23, 2011

7.9 Membership in Professional Organisations and Societies

Slovak Professional Organisations and Societies

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

Ladislav Hudec
- Slovak Association for Information Security (member, since 1996; president since 1998, vice-president, since 2006)
- Slovak Centre of the IET (member, since 1996; vice-president 1996-1998)
- Slovak Chapter of the ISACA (member, since 2002)

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

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

Martin Šperka
- Slovak Society for Informatics (member, since 2006)

International Professional Organisations and Societies

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

Ondrej Hirjak
– ACM, Association for Computing Machinery (member, since 2008)

Ladislav Hudec
– Information Systems Audit and Control Association (member, since 1998)
– IEEE, Institute of Electrical and Electronic Engineers (member, since 2006)
– IEEE Computer Society (member, since 2008)

Jiří Pospíchal
– EUROFUSE, EURO Working group on fuzzy sets (member, since 2007)

Viliam Solčány
– ACM, Association for Computing Machinery (member, since 2004)

Peter Trebatický
– IEEE, Institute of Electrical and Electronic Engineers (member, since 2007)
– IEEE Computer Intelligence Society (member, since 2008)

7.10 Other Activities

– National COST Coordinator, L. Hudec (since 1993)

– Member of the COST Senior Officials Committee, L. Hudec (since 1993)

– Artificial Intelligence Seminar – V. Kvasnička (organizer)
  www.fiit.stuba.sk/~kvasnicka/Seminar_of_AI

– Journal of Computing and Information Technology –V. Kvasnička (since 2005): members of advisory board

– MATCH Communications in Mathematical Chemistry – V. Kvasnička (since 1998): member of advisory board

– Neural Network World – V. Kvasnička (since 2001): member of advisory board

– Croatica Chimica Acta – V. Kvasnička (since 2002): member of advisory board

– Computing and Informatics (CAI) – V. Kvasnička, J. Pospíchal: members of editorial board

– CESCG 2011 – Central European Seminar on Computer Graphics, Budmerice castle, Slovakia – M. Šperka: member of programme committee

– Cognition and Artificial Life XI, Smolenice – V. Kvasnička, J. Pospíchal: member of programme committee

– GCCP 2011 – 7th International Workshop on Grid Computing for Complex Problems, October 24-26, 2011, Bratislava, Slovakia – L. Hudec: member of programme committee

– INFORMATICS 2011, November 16 - 18, 2011 in Rožňava, Slovakia – V. Kvasnička, L. Hudec: members of programme committee

– MENDEL 2011 – 17th International Conference on Soft Computing, Brno, Czech Republic – V. Kvasnička, J. Pospíchal: members of programme committee

- SAMI 2011 – 9th International Symposium on Applied Machine Intelligence and Informatics, January 27-29, 2011, Smolenice, Slovakia – V. Kvasnička: member of programme committee
- SCCG 2011 – Spring Conference on Computer Graphics, Vinicne, Slovakia – M. Šperka: member of programme committee
- Researchers' night – A. Kovárová, A. Fogelton, L. Varga, P. Vilhan – presentations of research – September 23, 2011

8 Institute of Computer Systems and Networks

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Web:	upss.fiit.stuba.sk
Tel:	+ 421 2 654 22 707
Fax:	+ 421 2 654 20 587

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

These courses cover basics and principles of mathematics, physics, basics of computing and programming, 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 and Communication Systems and Networks (bachelor degree),
- Computer and Communication Systems and Networks (master degree).

The institute has been active and successful in research and reflects in research the current development of computer engineering in the world. 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
> Pavel Čičák, Assoc. Professor

Deputy Director
> Katarína Jelemenská, PhD.
> Elena Gramatová, Assoc. Professor

Administrative Department
> Katarína Pribišová

Teaching Staff
> Pavel Čičák, Assoc. Professor
> Marcel Baláž, PhD. (part time)
> Boris Dado
> Jana Flochová, PhD.
> Elena Gramatová, Assoc. Professor
> Igor Grellneth, PhD.
> Pavol Horváth, Professor (part time)
> Ján Hudec
> Katarína Jelemenská, PhD.
> Milan Kolesár, Professor
> Margaréta Kotočová, Assoc. Professor
> Ivan Kotuliak, Assoc. Professor
> Tibor Krajčovič, Assoc. Professor
> Jana Parízková (part time)
> Elena Tomalová (part time)
> Peter Trúchly, PhD.

Researchers
> Dušan Bernát

Full time PhD Students
> Jaroslav Abaffy
> Ján Balažia
> Andrej Binder
> Martin Hrubý
> Matej Jurikovič
> Peter Jombík
> Tomáš Kováčik
> Štefan Krištofík
> Michal Kudlačák
> Dominik Macko
> Peter Magula
> Ján Murányi
> Tomáš Nečas
> Michal Olšovský
> Peter Pištek
> Mária Pohronská

8.2 Teaching

Undergraduate Study (Bc.)

Course	Semester	Credits	Lecturer
Computer Engineering Principles	Autumn	6	J. Flochová
Computer Application Design	Spring	6	P. Čičák
Computer and Communication Networks	Spring	6	M. Kotočová
Convergence of Mobile and Wired Networks	Autumn Spring	6	I. Kotuliak
Digital Systems Description	Autumn	6	K. Jelemenská
Engineering Methods	Autumn	4	P. Čičák
Final Bachelor Project I-II	Autumn Spring	3-9	P. Čičák
Logic Circuits	Autumn	6	J. Hudec
	Spring	6	M. Kolesár
Machine Level Programming	Spring	6	P. Čičák
Microcomputers	Spring	7	T. Krajčovič
Peripheral Devices	Autumn	6	P. Horváth
Principles of Communication Systems	Autumn	6	P. Trúchly
Switching and routing in IP networks	Autumn	6	I. Grellneth
WAN Technologies	Spring	6	I. Grellneth

Master Study (Ing.)

Course	Semester	Credits	Lecturer
Communication Services and Networks	Autumn	6	M. Kotočová
Computing Systems Research	Autumn	2	E. Gramatová
Reliability of Digital Systems	Spring	6	E. Gramatová
Digital Systems Design	Spring	6	K. Jelemenská
Digital Systems Testing	Autumn	6	E. Gramatová
Diploma Project I-III (Computer and Communication Systems and Networks)	Autumn Spring	8-12-20	P. Čičák
Distributed Computer Systems	Autumn	6	D. Bernát
Embedded Systems	Autumn	6	T. Krajčovič
NGN Networks, Services and Protocols	Spring	6	I. Kotuliak
Reconfigurable Digital Systems	Spring	6	J. Flochová
Satellite Systems	Spring	6	P. Trúchly
Systems on Chip Design	Autumn	6	M. Baláž
Team Project I-II (Computer and Communication Systems and Networks)	Autumn Spring	7-5	J. Hudec
Wireless Communication Systems	Autumn	6	I. Kotuliak

8.3 Theses

Bachelor (Bc.) Theses - graduates 2011

Study Programme Computer and Communication Systems and Networks

- Baďura, Roman: *Interprocess Communication in Operating Systems*.
  Supervisor: D. Bernát

- Blesák, Viktor: *Automatic Solving Problem of Covering with Petrick's Method I*.
  Supervisor: M. Kolesár

- Drienko, Peter: *Modeling and Aimulation of Mobile Ad Hoc Networks*.
  Supervisor: P. Magula

- Hyben, Martin: *New Interface for the Program KaTaLyzer*. Supervisor: I. Kotuliak

- Jančiga, Tomáš: *Visualization of Topology for Program Dynagen*.
  Supervisor: I. Grellneth

- Kardoš, Martin: *Web Interface for Network Traffic Analysis*.
  Supervisor: T. Kováčik

- Klobušický, Ivan: *Routing in Mobile Ad Hoc Networks*. Supervisor: P. Magula

- Kokolevský, Tomáš: *Creation of Production Environment for VoIP Telephony*.
  Supervisor: I. Kotuliak

- Kudlačák, František: *Program System Supporting Synthesis of Asynchronous Sequential Circuits*. Supervisor: E. Tomalová

- Kušnier, Juraj: *Security of Mobile Ad Hoc Networks*. Supervisor: P. Magula

- Kvasnička, Igor: *Extracting and Visualizing Relationship in E-Mail Communication*. Supervisor: D. Bernát

- Laštinec, Ján: *Expansion Modules for EMP386EX Microcomputer*.
  Supervisor: T. Krajčovič

- Maron, Ľubomír: *Application of Sensor Network*. Supervisor: P. Trúchly

- Martinický, Rastislav: *Application of Sensor Network*. Supervisor: P. Trúchly

- Matula, Tomáš: *Practical Usage of GPS Data*. Supervisor: J. Abaffy

- Minarič, Tomáš: *Automatic Design of Combinational Logical Circuits with Single Output using Logic Gates "Majority of Three"*. Supervisor: M. Kolesár

- Nagy, Gábor: *Practical Use of GPS Dates*. Supervisor: J. Abaffy

- Perešíni, Ondrej: *Reconfigurable Architecture for Hardware Encryption of Data*.
  Supervisor: M. Pohronská

- Pszota, Dávid: *Data Synchronization between PC and Mobile Phone*.
  Supervisor: B. Dado

- Sidor, Samuel: *Automatic Synthesis of Combinational Logic Circuits with Multiple Outputs using Decoders*. Supervisor: M. Kolesár

- Süll, Zsolt: *Logical Design of IP Networks*. Supervisor: M. Kotočová

- Ščepka, Daniel: *Protocol TCP in Wireless Systems*. Supervisor: P. Trúchly

- Šutý, Karol: *Analysis of Multiplexer Trees*. Supervisor: P. Pištek

- Vaďura, Matúš: *Logical Design of IP Networks*. Supervisor: M. Kotočová
- Žilinčík, Michal: *Abstractions Describing Hardware Resources of System*. Supervisor: D. Bernát

Study Programme Computer Systems and Networks

- Bešina, Ivan: *Performance of SCTP Protocol in Wireless Ad-Hoc Networks*. Supervisor: P. Trúchly
- Bôžik, Peter: *Advanced Methods of Inter-Process Communication*. Supervisor: J. Abaffy
- Halagan, Tomáš: *Optimization of Measuring Means in Measuring in Ethernet Network*. Supervisor: T. Kováčik
- Jasovský, Peter: *Migration of Existing Physical Servers into Virtualized Environments*. Supervisor: J. Abaffy
- Kebis, Michal: *Reconfigurable Architecture for Hardware Data Encryption*. Supervisor: M. Pohronská
- Kováč, Štefan: *Performance of Optical Networks in Metropolitan Area*. Supervisor: I. Kotuliak
- Kvitkovič, Matej: *Distributed Computing on Java Platform*. Supervisor: J. Abaffy
- Štepanovič, Martin: *Efficiency of DCCP Protocol in Wireless Ad-Hoc Networks*. Supervisor: P. Trúchly
- Šuhaj, Lukáš: *Inteligent Data Network Solution for Residential House*. Supervisor: P. Horváth
- Tóth, Jozef: *Migration of Existing Physical Servers into a Virtualised Environment*. Supervisor: J. Abaffy

Study Programme Informatics

- Habdák, Martin: *Visualization of SQL Queries*. Supervisor: J. Parízková
- Holák, Peter: Transaction Management in a Support Tool. Supervisor: J. Parízková
- Miňo, Igor: *Software Support for Object Database Systems*. Supervisor: J. Parízková

Master (Ing,) Theses – graduates 2011

Study Programme Computer Systems and Networks

- Bánik, Tomáš: *Projects Based on FPGA Reconfigurable Circuits*. Supervisor: J. Flochová
- Bereš, Ondrej: *Protocol TCP in Satellite Systems*. Supervisor: P. Trúchly
- Binder, Martin: *Experimental Embedded Expert System*. Supervisor: M. Pohronská
- Binder, Andrej: *Television over Internet Protocol*. Supervisor: I. Kotuliak
- Boroš, Martin: *The Extension of Possibilities for use Application "Chyťaspounovka"*. Supervisor: E. Tomalová

- Budinský, Peter: *Software Support for Designing and Planning Computer Networks.* Supervisor: P. Čičák

- Burda, Filip: *Optimisation of IP/MPLS Network.* Supervisor: M. Kotočová

- Ďarmek, Vratislav: *Usage of Multiprocessor Systems*. Supervisor: B. Dado

- Dúcky, Viktor: *Interactive Presentation System*. Supervisor: K. Jelemenská

- Ďurista, Tomáš: *High Availability Cluster using Virtualization Resource.* Supervisor: J. Abaffy

- Fülöp, Martin: *Automatic Design of TANT Circuits in Grid Environment.* Supervisor: M. Kolesár

- Geržo, Daniel: *Web Application Built upon Modern Development Approaches*. Supervisor: J. Abaffy

- Havrila, Peter: *Management Tools of MPLS Networks.* Supervisor: M. Kotočová

- Hollý, Jakub: *Transcript of Stochastic Petri Nets into VHDL Code.* Supervisor: J. Flochová

- Januš, František: *Verification of Data Classification in Mobile Networks – Application Protocols*. Supervisor: P. Mader

- Jombík, Peter*: Embedded System for Remote Monitoring and Management of Household*. Supervisor: M. Pohronská

- Kišák, Stanislav: *Experimental Embedded System for Remote Monitoring and Regulation Management*. Supervisor: M. Pohronská

- Knězek, Marián: *Routing Approaches in TCP/IP Networks.* Supervisor: M. Kotočová

- Konôpková, Klaudia: *Interconnection of IP Multimedia Subsystem (IMS) Domains.* Supervisor: T. Kováčik

- Kudlačák, Michal: *Automatic Design of Logical Combinative Circuits TONT in Grid Environment.* Supervisor: M. Kolesár

- Macko, Dominik: *VHDL Digital Systems Model Visualization*. Supervisor: K. Jelemenská

- Majzlík, Michal: *Application for Diagnosing Errors Using the Models - Petri Nets.* Supervisor: J. Flochová

- Malečka, Peter: *Linux Based Communication Server on TI DaVinci Platform.* Supervisor: B. Dado

- Martinický, Stanislav: *Protocol TCP in Wireless Systems.* Supervisor: P. Trúchly

- Mikóczy, Tibor: *Data Exchange between Mobile Phones and PC.* Supervisor: B. Dado

- Murányi, Ján: *Interconnecting of IP Multimedia Subsystem (IMS) Domains.* Supervisor: T. Kováčik

- Nemeček, Juraj: *SIP Single Port*. Supervisor: I. Kotuliak

- Oravec, Martin: *Automatic Integration of Logic Combination Circuits with Multiplexers in Grid Enviroment.* Supervisor: M. Kolesár

- Patoprstý, Mário: *Computing Cluster Resources Virtualization.*
  Supervisor: D. Bernát

- Pavlík, Daniel: *Computational Model of the Cerebral Cortex Activation.*
  Supervisor: P. Hubka

- Pilarčík, Viliam: *Security Chosen Parts of the Operating System against Failure.*
  Supervisor: J. Abaffy

- Píš, Peter: *Special Functions' Design of the Network Adaptor in PLD.*
  Supervisor: J. Hudec

- Pivarček, Ján: *Fault Modeling with Stochaistic Automata.* Supervisor: J. Flochová

- Popelka, Martin: *Universal E-Learning System.* Supervisor: E. Tomalová

- Pozdech, Boris: *Design of Communication Channel Protection in IMS Network.*
  Supervisor: I. Kotuliak

- Siebert, Miroslav: *Editor, Animator and Verificator of Petri Nets.*
  Supervisor: M. Kolesár

- Sivák, Marek: *Timed Automata in Modeling of Discrete Systems and Fault Diagnostics.* Supervisor: J. Flochová

- Szabó, Rastislav: *The System for Monitoring User Activity in Local Area Network.*
  Supervisor: J. Michalák

- Ševeček, Gabriel: *Retaining Proxy for Early Spam Detection.*
  Supervisor: J. Michalák

- Štrba, Juraj: *Diagnostic Tool to Detect the State of Elements by the OBD 2 Protocol.* Supervisor: T. Krajčovič

- Štroffek, Michal: *Generating of Functional Tests for VLSI Circuits.*
  Supervisor: J. Hudec

- Tanko, Michal: *Remote File Management on Cisco Devices.*
  Supervisor: I. Grellneth

- Valent, Martin: *Software Education Support in the Subject Assemblers.*
  Supervisor: P. Čičák

- Valko, Martin: *Access Methods for High-Speed Optical Ring Network.*
  Supervisor: I. Kotuliak

- Zapatický, Michal: *Stochastic Petri Nets in Modelling Failures.*
  Supervisor: J. Flochová

- Zembuchová, Ľudmila: *Using Green IT Technology in Information Systems.*
  Supervisor: R. Páterek

Study Programme Information Systems

- Tomašovič, Tomáš: *Databases for Embedded Systems.* Supervisor: J. Parízková

Doctoral (PhD.) Theses

Student name:	Roland Dobai
Degree program:	Applied Informatics
Thesis title:	*Test Generation for Asynchronous Sequential Digital Circuits*
Supervisor:	Elena Gramatová, Associate Professor
Defended on:	January 19, 2011
Annotation:	The dissertation thesis is aimed at test generation for asynchronous sequential digital circuits, contributes to their time- and cost-effective testing, and indirectly supports their wider application, which improves the performance, the power consumption and the electromagnetic emission of future digital circuits. The main scientific contribution is design of the new test generator (optimized for test length and area overhead) for wide spectrum of asynchronous sequential digital circuits. The contributions are identification of unacceptable signal transitions before test generation, reduced number of generated test patterns for combinational representation, effective state justification on the gate level, fast (optimized for test length) sequential fault propagation to outputs and effective fault simulation. Experimental results confirmed the generation of optimal tests with good fault coverage and without application of any method for increasing the testability. The developed methods can be used with wider spectrum of circuits than other recently developed test generators, and at the same time their effectiveness ensures fast test generation.

Student name:	Attila Štrba
Degree program:	Applied Informatics
Thesis title:	*Wireless Embedded Systems Powered by Energy Harvesting*
Supervisor:	Tibor Krajčovič, Associate Professor
Defended on:	November 23, 2011
Annotation:	Ambient intelligence requires that devices integrated to the environment are self-sustaining and maintenance free. To fulfill the vision of ambient intelligence, the design of small wireless embedded systems powered by energy harvesting is needed. Our work raises awareness that generic embedded system and wireless sensor nodes are different from wireless embedded systems powered by energy harvesting (WESPEH) therefore a different design approach is required. The work introduces a new design technique based on rapid prototyping and constraints analysis. From different groups of constraints the software problematic is developed in detail further with the focus on operating system design. We define the requirements, architecture and design aspects of energy autonomous operating systems. Based on these definitions a new operating system DolphinAPI is designed and implemented initially on EO3000I hardware platform. A new operating system quantification method - considering energy consumption, footprint size and scheduler behavior - is introduced as well and used to evaluate and compare TinyOS and Dolphin API. The method is based on vector definition and trace-driven performance analysis.

8.4 IIT.SRC Students' Papers

Full papers

- Bernát, Dušan: *Measurement Based Estimate of the Internet Diameter*. Supervisor: P. Čičák

- Babiš, Miroslav – Ďuríček, Maroš – Harvanová, Valéria – Vojtko, Martin: *Forest Guardian - Monitoring System for Detecting Logging Activities Based on Sound Recognition.* Supervisor: M. Pohronská

- Burda, Filip: *Decreasing Packet Loss of VoIP Calls by Optimising Transport Network*. Supervisor: M. Kotočová

- Hrubý, Martin: *Evaluating Delay and Jitter on D-ITG Generated VoIP*. Supervisor: M. Kotočová

- Kloska, Matej: *Sincerus: Multiplatform Python Application Framework.* Supervisor: P. Pištek

- Konôpková, Klaudia: *Sharing List of Services among IMS Cores*. Supervisor: T. Kováčik

- Krištofík, Štefan: *Automatic Generation of Stochastic Diagnosers*. Supervisor: J. Flochová

- Kudlačák, Michal: *Minimization of TONT Networks*. Supervisor: M. Kolesár

- Magula, Peter: *An Extension of Stateless Wireless Ad hoc Networks Quality of Service Model*. Supervisor: M. Kotočová

- Malečka, Peter: *Communication Server for Linux Based Embedded Systems*. Supervisor: B. Dado

- Murányi, Jan: *Sharing the Availability of IMS Cores in the Service Sharing System*. Supervisor: T. Kováčik

- Nagy, Martin – Oros , Dávid – Panenka, Roman – Pirháč, Martin – Severínová, Hana – Svetlík, Martin: *NS2IT: Simplification of Computer Network´s Simulation*. Supervisor: P. Magula

- Olšovský, Michal: *TCP with Advanced Window Scaling*. Supervisor: M. Kotočová

- Perešíni, Ondrej: *Transparent Encryption of Data with Embedded Peripheral Hardware.* Supervisor: M. Pohronská

- Pohronská, Mária: *Architectures for Hardware Acceleration in Knowledge-Based Embedded Systems*. Supervisor: T. Krajčovič

- Tanko, Michal: *Remote File Management on Cisco Devices*. Supervisor: I. Grellneth

Extended Abstracts

- Broniš, Roman – Cséfalvay, Pavel – Káčer, Lukáš – Kozemčák, Andrej – Morvay, Peter – Sloboda, Adam: *VLAB*. Supervisor: I. Grellneth

- Ďurista, Tomáš – Binder, Andrej – Ďarmek, Vratislav – Lesňák, Rudolf – Pagáč, Matej: *Data and Information Sharing in Workgroup*. Supervisor: B. Dado

- Jánoš, Martin – Chytil, Róbert – Virkler, Róbert – Lorincz, Tomáš – Takács, Tomáš: *Environment for Digital System Design*. Supervisor: P. Pištek

  −   Sivák, Marek Pivarček, Ján: *Relations Discovering in Educational Texts based on User Created Annotations*. Supervisor: J.Flochová

8.5 Research Laboratories

Computer Networks Laboratory I

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

Computer Networks Laboratory II

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

Embedded Systems Laboratory

Manager: T. Krajčovič
Contact: tibor.krajcovic@stuba.sk
Description: The research and teaching laboratory is predefined for teaching embedded systems, microprocessors and microcomputers, computer interfacing and digital equipment construction to undergraduates in the study programme Computer and Communication 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 (digital oscilloscopes,

logic analyzers, in-circuit emulators, Intel Atom and PXA based embedded system development kits) necessary for practical teaching.

VLSI Design Laboratory

Manager: J. Hudec
Contact: jan.hudec@stuba.sk
Description: The VLSI design laboratory is predefined for teaching of programmable logic devices in graduate study of Computer and Communication systems and networks, orientation in 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 computers with internet connection and other hardware and software components and tools (XILINX ISE WebPack, MODELSIM) for programmable circuits CPLD and FPGA practical teaching.

Digital Systems Description and Design Laboratory

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

Mobile Computing Laboratory

Manager: I. Kotuliak (UPSS), V. Vranić (UISI), M. Čerňanský (UAPI)
Contact: ivan.kotuliak@stuba.sk
Description: The main purpose of the laboratory is to support research and teaching process related to mobile computing. Laboratory supports research and student projects from multiple domains that can greatly benefit from mobile computing technology such as computer vision, computer graphics, machine learning and augmented reality. Currently the laboratory equipment consists of several iOS mobile phone and tablet PC devices (Apple iPhone, Apple iPad) and computers used for development applications for mobile devices. In near future laboratory will be equipped with devices running Android (Google), Symbian OS (Nokia) and eventually other major mobile computing platforms (Windows Phone 7, RIM Blackberry, Samsung Bada).

8.6 Research projects

Robust MPC for Hybrid Systems (RPHS) (VEGA 1/1105/11)

Project leader:	T. Krajčovič for UPSS
Members UPSS:	M. Pohronská
Supported by:	Scientific Grant Agency of the Ministry of Education of Slovak Republic and the Slovak Academy of Sciences
Duration:	January 2011 – December 2013
Description:	The last five years are marked by an increased interest in development of new control methods for heterogeneous hybrid process that include continuous and discrete dynamics. Research in control methods for hybrid non linear dynamic systems represent a new evolution trend in development and application of control algorithms that help considerably improve performance of complex technological processes within a wide spectrum of applications (power industry, car industry, health care, biotechnologies, transportation, service industry). Those advanced methods apply principles and methods of prediction, robustness, optimality and embeddedness. The main objective of the project is research and development, algorithmization and implementation of robust predictive control methods for non linear hybrid processes using modem information, communication and centrol technologies and systems realized by embedded computer systems.

Security and Reliability in Distributed Computer Systems and Mobile Computer Networks (VEGA, 1/0649/09)

Project leader:	P. Čičák for UPSS
Members UPSS:	M. Kolesár, D. Bernát, B.Dado, J. Flochová, J. Hudec, K. Jelemenská, M. Kotočová, T. Krajčovič, I. Grellneth, J. Abaffy, M. Pohronská, P. Pištek, M. Jurikovič, P. Magula
Supported by:	Scientific Grant Agency of the Ministry of Education of Slovak Republic and the Slovak Academy of Sciences
Duration:	January 2009 – December 2011
Description:	Project deals with new methods and tools for development for security and reliability implementation in distributed computers systems and mobile computer networks. Distributed system is presented by grid systems (clusters). The project solves the creation of real time grid system with reliability enhancement by means of standard operating system. Further, it solves the implementation of secure access control to grid resources by means of certificates. The last solved field in distributed environment is modular method for permanent or intermittent fault diagnostics. The diagnostic method is based on the knowledge of algebraic Petri net model of system, whereas the model is extended to probabilistic and time parameters. The mobile computer network is presented by wireless mobile ad hoc network. The project solves the problem of node failure, packets losses and end-to-end communication interruption from the point of communication reliability.

Innovative approaches for improvement of delivered Quality of Service in the Next Generation Networks (NGN) (VEGA, 1/0243/10)

Project leader:	I. Kotuliak
Members UPSS:	P. Trúchly, J. Flochová. M. Kotočová, T. Kováčik, I. Grellneth
Supported by:	Scientific Grant Agency of the Ministry of Education of Slovak Republic and the Slovak Academy of Sciences
Duration:	January 2010 – December 2011
Description:	Converged networks, deploying unified platform for the multimedia and data transmission, are the main trends for telecommunication operators. The soft switch architecture and distributed architecture of IP Multimedia Subsystem (IMS) are main implementations of such networks being implemented currently. This project is oriented into two parts related to general implementation of the converged network: (i) access layer of the network based on optimization of performance parameters which influence the service quality perception by end parties. The project research is aimed at wireless and metropolitan optical environments. (ii) service quality provision in the IP/MPLS network. In this part, the project deals with queue management and optimization, fast recovery from network failure as well as fast convergence of routing protocols. Other research is based on latest trends in area of Future Generation Internet. Third part related to IMS addresses the investigation of statistical properties of the traffic, which can influence the whole system output.

Support of Building a Center of Exellence for Smart Technologies, Systems, and Services (ITMS 26240120005)

Project leader:	T. Krajčovič for UPSS
Members UPSS:	I. Kotuliak
Supported by:	European Structural Fund
Duration:	May 2009 – April 2011
Description:	The project aims at following: concentration of the top research-educational teams of smart technologies, systems, and services in Bratislava region; improving the quality of technological infrastructure and smart technology development of systems and services including the information and communication infrastructure modernization; improving effectiveness of the know-how transfer between academy and industry sphere in the area of smart technologies, systems, and services; improving integration into international cooperation in research and development in the field of smart technologies.

Support of Building a Center of Excellence for Smart Technologies, Systems, and Services II (ITMS 26240120029)

Project leader:	T. Krajčovič for UPSS
Members UPSS:	I. Kotuliak
Supported by:	European Structural Fund
Duration:	January 2010 – January 2013
Description:	The objective is to improve, build further, and put into operation the technological infrastructure that would enable to sustain the center of

excellence of research and development for enterprise information source processing and presentation with the application of advanced distributed architectures for parallel processing of extensive sources of semistructured data and high performance computing for complex applications.

Forest Guardian - The forest monitoring system (2010et013)

Project leader: M. Pohronská
Members UPSS: T. Krajčovič, M. Babiš, M. Ďuríček, V. Harvanová, M. Vojtko
Supported by: Tatrabanka Grant
Duration: January 2011 – December 2011
Description: The Forest Guardian project is focused on solving the problem of illegal timber lodging, by developing an embedded system aimed to detect the lodging activities in real time. The main concept of the system is utilization of sensors capable of sensing and recognizing the typical sounds of lodging activities. The intelligent sensor network is placed right in the forest area, with battery powered sensors mounted to treetops. The central node of the network is connected to the Internet and the system storage server. The status of lodging activities detected and technical data on the network are stored in regular intervals and can be displayed on the map through a developed web application.

Roaming in convergent communication networks (2010et015)

Project leader: P. Magula
Members UPSS: I. Kotuliak, T. Kováčik, J. Balažia, R. Broniš, M. Pisarovič, M. Somorovský
Supported by: Tatrabanka Grant
Duration: January 2011 – December 2011
Description: The goal of the project was to design and implement a real-world communication network based on the IP Multimedia Subsytem technology with an access network based on the mobile technology 802.11 and to measure selected qualitative parameters of its multimedial operation. We aimed to design an innovative mechanism for minimizing the latency introduced to the communication in the process of changing between 802.11 mobile access points. Apart from innovative research contributions of the project, its outcomes serve as a basement for teaching in courses "Wireless communication systems", "Convergence of mobile and wired networks" and "NGN networks, services and protocols". The project thus helps both in processes of development of actual communication technologies and teaching of their operation. As VoIP and IMS are currently the only alternatives of modern communication technologies, the project significantly contributes to preparing students for deploying and solving the real problems of the perspective communication technologies.

8.7 Publications

Journals

MAGULA, P.: Quality of Service in Mobile Ad hoc Networks. In: *Posterus.* October (2011), ISSN 1338-0087, (online).

MAGULA, P.: Service Differentiation in Mobile Ad hoc Networks. In: *Information Sciences and Technologies Bulletin of the ACM Slovakia.* Vol. 3, No. 2 (2011), ISSN 1338-1237, pp. 87-90.

MIKOCZY, E. - KOTULIAK, I. - van DEVENTER, O.: Evolution of the Converged NGN Service Platforms towards Future Networks. In: *Future Internet.* Vol. 3, Issue 1 (2011), ISSN 1999-5903, pp. 67-86.

International Conferences

BINDER, A. - KOTULIAK, I.: Building IP-based Television Systems using Open-source Software. In: *Proceedings Redžúr 2011.* 5th International Workshop on Multimedia and Signal Processing, Bratislava, Slovakia, Slovak University of Technology, 2011, pp. 49-52.

BURDA, F. - HAVRILA, P. - KNĚZEK, M. - KONÔPKOVÁ, K. - KOTULIAK, I. - MURÁNYI, J. - NEMEČEK, J.: Optimization of Network Redundant Technologies Collaboration in IMS Carrier Topology. In: *Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering.* Vol. 46, 6th International ICST Conf., Germany, Springer-Verlag Berlin Heidelberg 2011, pp. 705-712.

FLOCHOVÁ, J. - HOLLÝ, J. - ZAPATICKÝ, M. - PIVARČEK, J.: Model Based Implementation of Supervisors and Diagnosers in VHDL Code of Programmable Systems. In: *EUROCON 2011.* International Conference on Computer as a Tool joint with CONFTELE 2011, Lisbon, Portugal, IEEE Computer Society, 2011, pp. 90-92.

FLOCHOVÁ, J. - MUDRONČÍK, D. - MRAFKO, L.: On Industrial Techniques and Real-time Information Technology Teaching. In: *Selected Topics in Modelling and Control.* Vol. 7, Bratislava, Slovakia, Slovak University of Technology, 2011, pp. 100-105.

GRELLNETH, I. - HRUBÝ, M. - VILHAN, P.: Emulating Cisco Network Laboratory Topologies in the Cloud. In: *ICETA 2011.* 9th IEEE International Conference on Emerging eLearning Technologies and Applications, Stará Lesná, Slovakia, Piscataway IEEE, 2011, pp. 67-92.

HUDEC, J.: An Efficient Technique for Processor Automatic Functional Test. In: *ITI 2011.* Proceedings of the 33rd International Conference on Information Technology Interfaces, Cavtat / Dubrovnik, Croatia, Zagreb University Computing Centre, 2011, pp. 527-532.

HUDEC, J.: Processor Functional Test Generation - Some Results with Using of Genetic Algorithms. In: *Second Eastern European Regional Conference on the Engineering of Computer Based Systems.* Bratislava, Slovakia, Los Alamitos IEEE Computer Society, 2011, pp. 159-160.

JELEMENSKÁ, K. - ČIČÁK, P. - DÚCKY, V.: Interactive Presentation towards Students' Engagement. In: *Procedia Social and Behavioral Sciences.* Vol. 29, No. 1 (2011),

2nd International Conference on Education and Educational Psychology, ICEEP-SY, 2011, pp. 1645-1653.

JELEMENSKÁ, K. - SIEBERT, M. - MACKO, D. - ČIČÁK, P.: Logic Circuit Design Verification Support Tool - FitBoard. In: *Procedia Social and Behavioral Sciences*. Vol. 28, No. 1-4 (2011), WCETR 2011, World Conference on Educational Technology Researches, Near East University, Cyprus Educational Sciences Association, Nicosia / Kyrenia, North Cyprus, Elsevier, 2011, pp. 305-310.

JELEMENSKÁ, K. - KOINE, P. - TUROŇ, J. - ČIČÁK, P.: Natural User Integrated in Petri Net Educating Environment. In: *Procedia Social and Behavioral Sciences*. Vol. 28, No. 1-4 (2011), WCETR 2011, World Conference on Educational Technology Researches, Near East University, Cyprus Educational Sciences Association, Nicosia / Kyrenia, North Cyprus, Elsevier, 2011, pp. 316-321

KOTULIAK, I. - RYBÁR, P. - TRÚCHLY, P.: Performance Comparison of IPsec and TLS Based VPN Technologies. In: *ICETA 2011*. 9th IEEE International Conference on Emerging eLearning Technologies and Applications, Stará Lesná, Slovakia, Piscataway IEEE, 2011, pp. 217-221.

KOVÁČIK, T. - KOTULIAK, I.: Service Sharing among IMS Domains. In: *CompSysTech'11*. Proceedings of the 12th International Conference on Computer Systems and Technologies, Vienna, Austria, New York ACM Press, 2011, pp. 435-441.

KOVÁČIK, T. - MARUSCHKE, M. - KOTULIAK, I.: Liberalization of Telecommunication Services Market - Sharing Multimedia Services in Interconnected IMS Domains. In: *Proceedings of the 2011 International Conference on Telecommunication Systems*: *Modelling and Analysis*, 2011, pp. 63-75.

MACKO, D. - JELEMENSKÁ, K.: VHDL Structural Model Visualization. In: *EUROCON 2011*. International Conference on Computer as a Tool Joint with CONFTELE 2011, Lisbon, Portugal, IEEE Computer Society, 2011, pp. 1-4.

MAGULA, P. - KOTOČOVÁ, M.: Quality of Service Models for Mobile Ad-hoc Networks. In: *CompSysTech'11*. Proceedings of the 12th International Conference on Computer Systems and Technologies, Vienna, Austria, New York ACM Press, 2011, pp. 448-453.

MÁNIK, M. - GRAMATOVÁ, E.: Efficient Diagnostics Algorithms for Regular Computing Structures. In: *Proceedings of the 2011 IEEE Symposium on Design and Diagnostics of Electronic Circuits and Systems*. Cottbus, Germany, Los Alamitos IEEE Computer Society, 2011, pp. 87-91.

ORTIGOSA, F. - FERNANDEZ, S. - MARIN, A. - PROSEPIO, D. - IRIBARNE, B. - ORMAETXEA, I. - KOTULIAK, I. - KOVÁČIK, T. - MIKOCZY, E. - LAHNALAMPI, T. - KOSKI, T. - HAKALA, P. - ILITALO, J. - TERÄSLAHTI, J.: Interoperability among Different IMS Cores. In: *Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering*. Vol. 46, 6th International ICST Conference, Berlin, Germany, Springer-Verlag Berlin Heidelberg, 2011, pp. 753-764.

POHRONSKÁ, M. - KRAJČOVIČ, T.: Embedded System Architecture for Real-time Rule-based Reasoning. In: *Second Eastern European Regional Conference on the Engineering of Computer Based Systems*. Bratislava, Slovakia, Los Alamitos IEEE Computer Society, 2011, pp. 85-91.

POHRONSKÁ, M. - KRAJČOVIČ, T.: FPGA Implementation of Multiple Hardware Watchdog Timers for Enhancing Real-Time Systems Security. In: *EUROCON 2011*. International Conference on Computer as a Tool joint with CONFTELE 2011, Lisbon, Portugal, Los Alamitos IEEE Computer Society, 2011, pp. 1-4.

Selected Local and National Conferences

JURIKOVIČ, M.: New Methods in Computer Systems Design. In: *PAD 2011 - Computer Architectures and Diagnostics 2011*. Czech-Slovak seminar for PhD students, Stará Lesná, Slovakia, Bratislava, STU, 2011, pp. 73-78.

KRIŠTOFÍK, Š.: BIRA Algorithms for SoC Embedded Memories. In: *PAD 2011 - Computer Architectures and Diagnostics 2011*. Czech-Slovak seminar for PhD students, Stará Lesná, Slovakia, Bratislava, STU, 2011, pp. 20-25.

PIŠTEK, P.: Reduction and Optimization of Multiplexer Trees. In: *PAD 2011 - Computer Architectures and Diagnostics 2011*. Czech-Slovak seminar for PhD students, Stará Lesná, Slovak Republic, Bratislava, STU, 2011, pp. 127-132.

POHRONSKÁ, M.: Embedded System Architecture for Real-time Rule-based Systems. In: *PAD 2011 - Computer Architectures and Diagnostics 2011*. Czech-Slovak seminar for PhD students, Stará Lesná, Slovakia, Bratislava, STU, 2011, pp.139-144.

8.8 Cooperation

Cooperation in Slovakia

− Institute of Informatics, Slovak Academy of Sciences, Bratislava

− Faculty of Electrical Engineering and Information Technology, Slovak University of Technology in Bratislava

− Faculty of Electrical Engineering and Informatics, Technical University of Košice

− Regional Cisco Networking Academy, Faculty of Electrical Engineering and Informatics, Technical University of Košice

− Faculty of Natural Sciences, Matej Bel University in Banská Bystrica

− Faculty of Management Science and Informatics, University of Žilina

− Faculty of Electrical Engineering, University of Žilina

− Regional Cisco Networking Academy, Faculty of Management Science and Informatics, University of Žilina

− Faculty of Informatics, Paneuropean University, Bratislava

− Abonus Ltd.

− Asseco Slovakia

− CISCO Systems Slovakia Ltd.

− Datalan

− GTEC Ltd.

− Hewlett-Packard Slovakia Ltd.

− IBM Slovakia Ltd.

- Molpir Ltd.
- Siemens Enterprise Communications Ltd.
- Soitron
- Spinet Ltd.
- Telekom
- Tempest

International Cooperation

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

Visits of Staff Members

- *T. Kováčik*: Hochschule fur Telekommunikation, Erasmus mobility, Leipzig, Germany, January 17-July 18, 2011
- *P. Čičák, E. Gramatová, K. Jelemenská*: Faculty of Information Technology, Brno University of Technology, Czech Republic, February 11, 2011
- *E. Gramatová*: Faculty of Information Technology, Brno University of Technology, Czech Republic, February 24, 2011
- *P. Trúchly:* LdV MLARG project meeting, Palermo, Italy, March 30 - April 4, 2011
- *E. Gramatová*: IEEE DDECS 2011, IEEE 14th International Symposium on Design and Diagnostics of Electronic Circuits & Systems, Cottbus, Germany, April 12-16, 2011
- *J. Flochová, K. Jelemenská, M. Pohronská*: Eurocon 2011, Lisbon, Portugal, April 26-30, 2011
- *P. Trúchly*: LdV IntEleCT project meeting, Milano, Italy, May 25-28, 2011
- *I. Kotuliak:* ICTSM 2011, International Conference of Technology Systems and Management, Prague, May 26-28, 2011

- *P. Čičák, I. Grellneth:* Regional Cisco Networking Academy Conference, Budapest, Hungary, May 27-28, 2011
- *T.Kováčik, P. Magula*: CompSysTech 2011, Vienna, Austria, June 17, 2011
- *M. Hrubý, P. Vilhan:* Annual Cisco NETACAD Conference, Hradec Králové, Czech Republik, June 24-25, 2011
- *J. Hudec:* ITI 2011, 33rd International Conference on Information Technology Interfaces, Cavtat, Croatia, June 26-30, 2011
- *E. Gramatová:* Faculty of Information Technology, Czech Technical University in Prague, Czech Republic, June 29, 2011
- *K. Jelemenská:* WCETR 2011, World Conference on Educational Technology Researches, Nicosia, North Cyprus, July 5-10, 2011
- *P. Čičák:* Cisco Networkers, Las Vegas, USA, July 8-23, 2011
- *T. Krajčovič, V. Harvanová:* Applied Electronics 2011, Pilsen, Czech Republic, September 6-9, 2011
- *I. Kotuliak:* HBB-Next Kick-off Meeting, Potsdam, Germany, October 3-5, 2011
- *P. Trúchly:* LdV MLARG project meeting, Istanbul, Turkey, October 11-17, 2011
- *K. Jelemenská:* ICEEPSY 2011, The International Conference on Education and Educational Psychology, Istanbul, Turkey, October 19-23, 2011
- *I. Kotuliak:* HBB-Next: WP2 Kick-off Meeting, Leuven, Belgium, October 20-21, 2011
- *P. Čičák, P. Pištek:* Gaudeamus 2011, Brno, Czech Republic, October 31 - November 4, 2011
- *A. Binder, I. Kotuliak, T. Kováčik, J. Murányi:* 3. ngnlab.eu workshop, Delft, The Netherlands, November 1-4, 2011
- *P. Čičák, I. Kotuliak.:* GRIFO 2011, Mikulov, Czech Republic, November 7-8, 2011
- *J. Abaffy, D. Macko, P. Pištek:* WCIT 2011, World Conference on Information Technologies, Antalya, Turkey, November 22-27, 2011

Visits to the Institute

- *Group of 16 Erasmus students*, Institute Supérieur d'Electronique de Paris, France, June – July 2011

8.9 Membership in Professional Organisations and Societies

Slovak Professional Organisations and Societies

Pavel Čičák

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

Elena Gramatová

- Slovak Society for Computer Science (member, since 1995)

Milan Kolesár
 – Slovak Centre of the IEE (member, since 2001)
 – Slovak Society for Computer Science (member, since 1995)

International Professional Organisations and Societies

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

Jana Flochová
 – IEEE, Institute of Electrical and Electronic Engineers (member, since 1998)

Elena Gramatová
 – IEEE, Institute of Electrical and Electronic Engineers (member, since 1995)
 – TTTC, Test Technical Technology Council (contact person for SR, since 1996)

Igor Grellneth
 – CEE CCNP RAIC – Central and Eastern Europe Cisco Certified Networking Professional Regional Academy Instructor Community (member, since 2006)

Ján Hudec
 – New York Academy of Sciences, member (member, since 1997)

Tibor Krajčovič
 – Slovak Commission for UNESCO. Informatics, Information and Communication Technologies (member, since 1994)

8.10 Other Activities

 – Newsletter of Cisco Networking academy in Slovakia – P. Čičák, I. Grellneth: members of editorial board

 – Working Group of the Accreditation Commission of Slovakia for Information Sciences and Technologies – E. Gramatová, member

 – CELTIC NETLAB: Use Cases for Interconnected Testbeds and Living Labs – I. Kotuliak, T. Kováčik: members of team and programme committee

 – Erasmus Sommer School 2011 – June 28 - July 22, 2011 – P Čičák: organizing team member, E. Gramatová, K. Jelemenská, T. Krajčovič: organizing team members and teachers, J. Abaffy, V. Harvanová, M. Hrubý, M. Jurikovič, D. Macko, P. Pištek, M. Pohronská: instructors

 – Networks Technologies Summer School 2011, July - August 2011 – P Čičák: organizing team member

 – Organization of annual doctoral seminar PAD 2011

 – IIT.SRC Invent 2011 – Mobile application design competition – I. Kotuliak: event organizer

- IJMIT, International Journal of Managing Information Technology –
  K. Jelemenská, J. Abaffy: editorial board members

- DDECS 2011 – 14th IEEE Symposium on Design and Diagnostics of Electronic Circuits and Systems, April 2011, Cottbus, Germany – E. Gramatová: member of programme and steering committees, K. Jelemenská: member of programme committee

- DSD 2011 – 14th Euromicro Conference on Digital System Design, August - September 2011, Oulu, Finland – E. Gramatová: member of programme committee

- ECBS-EERC 2011 – 2nd Eastern European Regional Conference on the Engineering of Computer Based System, September 2011, Bratislava, Slovakia – T. Krajčovič: member of programme committee

- ETS 2011 – 16th IEEE European Test Symposium, May 2011, Trondheim, Norway – E. Gramatová: member of programme committee

- EWDTS 2011 – East-West Design&Test Symposium, September 2011, Sevastopol, Ukraine – E. Gramatová: member of programme committee

- ICETA 2011 – 9th International Conference on Emerging E-Learning Technologies and Applications, October, 2011, Stará Lesná, Slovak Republic – P. Čičák, E. Gramatová, K. Jelemenská: members of programme committee

- ICNFI 2011 – International Conference on Networking and Future Internet, April 2011, Paris, France – I. Kotuliak: member of programme committee

- ICTSM2011 – International Conference on Telecommunication Systems, Modeling and Analysis, May 2011, Prague, Czech Republic – I. Kotuliak: member of programme committee

- IIT.SRC 2011– Informatics and Information Technologies Student Research Conference – P. Čičák, E. Gramatová, I. Grellneth, P. Horváth, K. Jelemenská, M. Kolesár, M. Kotočová, I. Kotuliak, T. Krajčovič: members of programme committee

- MEMICS 2011 – Annual Doctoral Workshop on Mathematical and Engineering Methods in Computer Science, October 2011, Lednice, Czech Republic – E. Gramatová: member of programme committee

- ngnlab.eu 2011 workshop – I. Kotuliak: member of programme committee

- PAD 2011 – Czech and Slovak Seminar on Computer Architectures and Diagnostics, September 2011, Stará Lesná, Slovak Republic – E. Gramatová: member of steering committee, P. Čičák, J. Flochová, E. Gramatová, K. Jelemenská: members of programme committee, J. Abaffy, P. Čičák, E. Gramatová, K. Jelemenská, M. Jurikovič, T. Nečas, P. Pištek, M. Pohronská: members of organizing committee

9 Institute of Informatics and Software Engineering

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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).

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

The Institute endeavours actively to cooperate. It includes interdisciplinary research and studies at other similar institutes, institutions and departments of its Faculty, its University, in Slovakia, in Europe and throughout the world. In particular, in 2007 the Institute was invited to join the international consortium of research institutions devoted to *Web Intelligence*. The Institute represents Slovakia in the consortium and contributes to promoting research in Web Intelligence worldwide. In 2009 the Institute has become partner of *European Network of Excellence on Aspect-Oriented Software Development, AOSD-Europe*, which integrates and coordinates research, education and dissemination activities of its members in the area of aspect oriented development of software. Originally, it has been a 7th Framework Programme project.

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

9.1 Staff

Director
> Pavol Návrat, Professor

Deputy Director
> Mária Bieliková, Professor
> Viera Rozinajová, Assoc. Professor

Administrative Department
> Zuzana Macková
> Alexandra Zakalová

Teaching Staff
> Nadežda Andrejčíková, PhD. (part time)
> Michal Barla, PhD.
> Pavel Bartoš
> Mária Bieliková, Professor
> Anna Bou Ezzeddine, PhD.
> Peter Brusilovsky, visiting Professor (part time)
> Ivana Budinská, PhD. (part time)
> Andrej Danko, PhD. (part time)
> Iveta Dekýšová
> Pavol Frič, PhD. (part time)
> Marta Gnipová (part time)
> Nikoleta Habudová
> Daniela Chudá, Assoc. Professor
> Ivan Kapustík

Gabriela Kosková, PhD.
Rastislav Královič, Assoc. Professor (part time)
Peter Lacko, PhD.
Michal Laclavík, PhD. (part time)
Ján Lang, PhD.
Marián Lekavý PhD. (part time)
Mária Lucká, Assoc. Professor (part time)
Ľubomír Majtás, PhD. (part time)
Ján Máté (part time)
Pavol Mederly, PhD. (part time)
Marián Mlynarovič, PhD. (part time)
Vladimír Mlynarovič, Assoc. Professor (part time)
Ľudovít Molnár, Professor
Pavol Návrat, Professor
Ivan Polášek, PhD.
Anna Považanová
Viera Rozinajová, Assoc. Professor
Tomáš Seidmann, PhD. (part time)
Jiří Šafařík, Professor (part time)
Ľubor Šešera, PhD. (part time)
Peter Tiňo, PhD., visiting Assoc. Professor (part time)
Jozef Tvarožek, PhD.
Michal Tvarožek, PhD.
Valentino Vranić, Assoc. Professor
Michal Winczer, PhD. (part time)

External Lecturers

Ján Genči, PhD.
Eva Letovancová, Assoc. Professor
Martin Marko
Jozef Papula, Professor
Petr Šaloun, Assoc. Professor
Danica Šoltésová, PhD.
Marián Šuráb, Assoc. Professor

Full-Time PhD Students

Peter Bartalos
Ladislav Borženský
Róbert Čapla
Zoltán Harsányi
Michal Holub
Peter Kajsa
Michal Kasan
Michal Kompan
Matej Košík
Tomáš Kramár
Tomáš Kučečka

Eduard Kuric
Tomáš Kuzár
Martin Labaj
Jakub Mažgut
Aurel Paulovič
Karol Rástočný
Štefan Sabo
Matúš Svrček
Ján Suchal
Roman Šelmeci
Jakub Šimko
Marián Šimko
Dušan Zeleník

9.2 Teaching

Undergraduate Study (Bc.)

Course	Semester	Credits	Lecturer
Artificial Intelligence	Spring	6	P. Návrat
Communication in Culture History	Spring	3	D. Šoltésová
Construction of Effective Algorithms	Spring	6	R. Královič
Data Structures and Algorithms	Autumn	6	P. Návrat
Entrepreneurship and Management	Autumn	5	J. Papula
Final Bachelor Project 0–II	Autumn Spring	3-3-9	P. Návrat
Functional and Logic Programming	Spring	6	M. Bieliková
Information and Communication Technologies Law	Spring	5	I. Dekýšová
Management of Social Systems	Spring	3	E. Letovancová
Managerial Economics	Autumn	5	V. Mlynarovič
Object-Oriented Programming	Spring	6	V. Vranić
Program Development for Java Platform	Spring	6	M. Marko
Programming Languages and Compilation	Autumn	6	Ľ. Molnár
Principles of Information Systems	Autumn	5	V. Rozinajová
Principles of Software Engineering	Spring	7	M. Bieliková
Procedural Programming	Autumn	6	A. Bou Ezzeddine
Procedural Programming Seminar	Autumn	0	G. Kosková
Research Seminar I-IV	Autumn Spring	0-3-3-3	M. Bieliková
Software Systems Development	Spring	3	M. Bieliková
Specification Methods and Tools	Spring	5	V. Vranić

Course	Semester	Credits	Lecturer
Social Connotations of Informatics and Information and Communication Technologies	Spring	3	M. Winczer
Theoretical Foundations of Informatics	Spring	6	D. Chudá
Web Publishing	Spring	6	P. Šaloun

Master Study (Ing.)

Course	Semester	Credits	Lecturer
Advanced Database Systems	Autumn	6	J. Genči
Architecture of Information Systems	Autumn	4	M. Mlynarovič
Architecture of Software Systems	Autumn	4	I. Polášek
Application Architectures of Software Systems	Spring	6	Ľ. Šešera
Aspect-Oriented Software Development	Autumn	6	V. Vranić
Design of Compilers	Autumn	6	Ľ. Molnár
Diploma Project I–III (Information Systems)	Autumn Spring	8-12-20	P. Návrat
Diploma Project I–III (Software Engineering)	Autumn Spring	8-12-20	M. Bieliková
Distributed Software Systems	Autumn	6	T. Seidmann
E-communication of Business and Administrative Processes	Spring	6	P. Frič
History of Design	Autumn	5	D. Šoltésová
Industry Project	Spring	5	I. Polášek
Information Search	Autumn	5	M. Laclavík
Knowledge Discovery	Autumn	6	G. Kosková
Knowledge-Based Systems	Autumn	5	I. Kapustík
Law – Selected Problems	Autumn	5	I. Dekýšová
Management of Software and Information System Projects	Spring	6	M. Bieliková
Object-Oriented Analysis and Design	Autumn	6	I. Polášek
Quality of Program and Information Systems	Spring	6	D. Chudá
Research of Information Systems	Autumn	2	P. Návrat
Rhetoric	Autumn	5	M. Šuráb
Research of Software Systems	Autumn	2	M. Bieliková
Team Project I-II (Information Systems, Software Engineering)	Autumn Spring	7-5	M. Bieliková

9.3 Theses

Bachelor (Bc.) Theses – graduates 2011

Study Programme Informatics

- Bielik, Pavol: *Innovative Application within an International Competition.*
  Supervisor: M. Barla

- Bilevic, Roman: *Application for XAdES Electronic Signature Validation.*
  Supervisor: J. Dobias

- Bimbo, Miroslav: *Application of Programming Model MapReduce on Processing of Large Data Sets.* Supervisor: M. Jemala

- Bisták, Andrej: *Connecting People through Web.* Supervisor: P. Návrat

- Blaho, Tomáš: *Web2.0 Tools and their Potential Uses in Libraries.*
  Supervisor: N. Andrejčíková

- Bučka, Peter: *Working with Streams in Java.* Supervisor: A. Považanová

- Burger, Roman: *Human-Like Artificial Player in a Board Game.*
  Supervisor: J. Tvarožek

- Calík, Jakub: *Heuristic Sudoku.* Supervisor: P. Bartoš

- Danada, Ondrej: *Automated Planning.* Supervisor: M. Lekavý

- Detko, Martin: *Development of an Intelligent Agent by Symbolic Approach of Artificial Intelligence.* Supervisor: P. Lacko

- Dušek, Martin: *Support for the Creation of Web Questionnaires.*
  Supervisor: J. Máté

- Erban, Daniel: *3D Simulated Robotic Soccer Player.* Supervisor: I. Kapustík

- Fehér, Michal: *File Manager.* Supervisor: A. Považanová

- Fejes, Máté: *Cloud-Based Navigation over Concepts.* Supervisor: M. Bieliková

- Feješ, Adrián: *Source Code Refactoring and it's Tool Support.* Supervisor: P. Kajsa

- Hitka, Matúš: *Heuristic Sudoku.* Supervisor: P. Bartoš

- Hlaváč, Marek: *Trainer of Mental Abilities.* Supervisor: M. Kasan

- Hlavenka, Marián: *Evolutionary Sudoku.* Supervisor: P. Bartoš

- Horváth, Róbert: *Supporting Term Explanation while Browsing in Slovak.*
  Supervisor: M. Šimko

- Hula, Igor: *Information System for Archiving Photo Documentation.*
  Supervisor: I. Budinská

- Hvolka, Juraj: *Comparison of Musical Notations.* Supervisor: N. Hrušková

- Chylik, Michal: *Web Portal Providing Access to Architectural Heritage of Regions.*
  Supervisor: V. Rozinajová

- Jendrej, Maroš: *File Manager.* Supervisor: A. Považanová

- Knapek, Pavol: *The Influence of Text Pre-Processing to Determine Similarity in Texts.* Supervisor: D. Chudá

- Kobyda, Adam: *The Portal to Accessing Architectural Monuments of the Region.* Supervisor: V. Rozinajová

- Kontúr, Radoslav: *Enterprise Service Bus as a Support for Service-Oriented Architecture.* Supervisor: M. Kasan

- Krátky, Peter: *Innovative Application within an International Competition.* Supervisor: M. Bieliková

- Lačný, Jozef: *Machine Recognition of Handwritten Numbers.* Supervisor: J. Mažgut

- Lajčin, Tomáš: *Internet Security.* Supervisor: I. Dekýšová

- Lazový, Michal: *Tag Similarity Discovery.* Supervisor: M. Šimko

- Lezo, Andrej: *Support of Online Questionnaires Evaluation.* Supervisor: J. Máté

- Macko, Peter: *Interactive Browser of Heterogeneous Web Content.* Supervisor: M. Tvarožek

- Maršalek, Maroš: *User Interface for Methods Generating Integration Solutions.* Supervisor: P. Mederly

- Mäsiar, Juraj: *Cliques in Random Nets.* Supervisor: M. Nehéz

- Mäsiar, Matej: *Distribution Solutions using Oracle Components.* Supervisor: R. Body

- Masný, Ľuboš: *Portal for Ski Centrum.* Supervisor: N. Hrušková

- Meliško, Peter: *Working with Streams in Java.* Supervisor: A. Považanová

- Mihalik, Adam: *Creating Intelligent Agent using Symbolic Approach of Artificial Intelligence.* Supervisor: P. Lacko

- Mihalik, Matej: *Support of Online Questionnaires Evaluation.* Supervisor: J. Máté

- Michalko, Pavel: *User Interface for Methods to Generate Integration Solutions.* Supervisor: P. Mederly

- Mikluššák, Igor: *Comparison of Musical Notations.* Supervisor: N. Hrušková

- Minárik, Roman: *Information Space of Social Networks.* Supervisor: P. Návrat

- Mitrík, Štefan: *Innovative Application within an International Competition.* Supervisor: M. Barla

- Mnich, Pavol: *Web Application for Music Notation.* Supervisor: N. Hrušková

- Nagy, Balázs: *Collection and Creation of Metadata via Interactive Games.* Supervisor: M. Tvarožek

- Paššák, Peter: *Modeling of Dynamic Systems using Soft Methods.* Supervisor: J. Cigánek

- Pavlech, Lukáš: *Web Application for Music Notation.* Supervisor: N. Hrušková

- Pomothy, Adam: *Application of Web Service Composition.* Supervisor: P. Bartalos

- Račev, Marek: *Creation of Intelligent Agent using Symbolic Approach of Artificial Intelligence.* Supervisor: P. Lacko

- Revický, Eugen: *Graphic Editor.* Supervisor: A. Považanová

- Ruman, Vladimír*: Simulating Human-Level Intelligence in Party Game.* Supervisor: J. Tvarožek

- Sládeček, Peter: *The Protection of Personal Data*. Supervisor: I. Dekýšová
- Staráček, Ľuboš: *Study of the Aspect-Oriented Change Realization at the Model Level.* Supervisor: V. Vranić
- Súkeník, Ján: *Processing of Large Datasets using MapReduce Programming Model*. Supervisor: P. Lacko
- Šalmík, Jakub: *Support of Web Surveys Creation*. Supervisor: J. Máté
- Ševcech, Jakub: *Web-Page Annotation*. Supervisor: M. Bieliková
- Škoda, Matej: *Creation an Intelligent Agent with Symbolic Branch of Artificial Intelligence*. Supervisor: P. Lacko
- Šveda, Michal: *Rule-Based System for Manipulation with Text Strings*. Supervisor: P. Bartoš
- Tomlein, Michal: *Innovative Application within an International Competition*. Supervisor: M. Bieliková
- Turský, Lukáš: *Model Driven Software Development*. Supervisor: P. Kajsa
- Ubreži, Maroš: *Collaborative Customization of the Schedule for Exam Surveillance*. Supervisor: M. Košík
- Vašíček, Igor: *Development with Model Driven Architecture*. Supervisor: Ľ. Majtás
- Volentier, Juraj: *Software Development Support in Current Development Tools*. Supervisor: Ľ. Majtás
- Vrablecová, Petra: *Testing Dynamic Aspects of Web Service Composition Tools*. Supervisor: P. Bartalos
- Zachar, Radoslav: *Evolution Algorithm for Sudoku Solving*. Supervisor: P. Bartoš

Master Theses – graduates 2011

Study Programme Information Systems

- Barilla, Marek: *Annotation of Web Services*. Supervisor: P. Bartalos
- Basár, Peter: *Multicriteria Web Content Recommendation in Social Networks*. Supervisor: M. Barla
- Beleš, Lukáš: *Search for the Sense of User Communication*. Supervisor: I. Kapustík
- Čelko, Matúš: *Implementation of a Modular Software Agent (Bot) into the Game Counter-Strike*. Supervisor: M. Závodský
- Černák, Celestín: *Information Processing in a Model of Biological Neural Network*. Supervisor: P. Hubka
- Demčák, Jozef: *Addressing the Challenges Inspired by the Behavior of Social Insects*. Supervisor: P. Návrat
- Ferencz, Frederik: *Websearch Based on Beehive Model*. Supervisor: A. Bou Ezzeddine
- Hopko, Andrej: *Classification of DNA Functional Regions Using Binary Tensor Decomposition*. Supervisor: J. Mažgut
- Hraško, Marián: *Similarity in Slovak Text and Source Code*. Supervisor: D. Chudá

- Hujsi, Ivan: *Expanding the Abilities of a Simulated Robotic Football Player to Handle the Ball*. Supervisor: I. Kapustík

- Jaborník, Martin: *Keyword Extraction Focused on Knowledge Discovery*. Supervisor: I. Polášek

- Jačala, Martin: *Relationship Discovery in Unstructured Text Using Semantic Analysis*. Supervisor: J. Tvarožek

- Jesenský, Michal: *Simulation of the Production Line Based on MAS*. Supervisor: I. Budinská

- Klinovský, Michal: *Keywords Extraction from Internet Discussions*. Supervisor: T. Kuzár

- Korduliak, Robert: *Using Web Service Composition Approaches in Tourism Domain*. Supervisor: M. Lekavý

- Krajčovič, Vladimír: *The Event Hierarchies for Support Lifelong Learning*. Supervisor: J. Lang

- Lackovič, Ľubomír: *Parallel Search in Graph Structure on Graphics Processor*. Supervisor: P. Lacko

- Mamatej, Vladimír: *The Optimalization of a Production Line by Means of Methods Using the Computer Simulations*. Supervisor: I. Budinská

- Mikluš, Miroslav: *Ontology Framework CIDOC-CRM and its Use in the Environment of SNG*. Supervisor: N. Andrejčíková

- Noskovič, Michal: *Personalized Search Using Social Networks*. Supervisor: P. Návrat

- Ott, Marián: *An Extenstion of Moodle*. Supervisor: A. Považanová

- Paulovič, Aurel: *Social Behaviour of Honey Bees as Inspiration for Data Mining*. Supervisor: P. Návrat

- Repta, Martin: *The System Facilitating the Creation of Mashup Applications*. Supervisor: V. Rozinajová

- Sokol, Matej: *Identification via User's Behavior Model*. Supervisor: D. Chudá

- Škuba, Andrej: *Improving Operations of a Search Engine Working on the Principle of Social Insect Behavior*. Supervisor: A. Bou Ezzeddine

- Táborský, Roman: *Feature Model Driven Generation of Software Artefacts*. Supervisor: V. Vranić

- Torda, Dušan: *Modelation and Prediction of Sequence Data in Financial Markets*. Supervisor: J. Mažgut

- Uhlík, Martin: *The Similarity of Texts in Slovak*. Supervisor: D. Chudá

Study Programme Software Engineering

- Abelovský, Peter: *Opinion Mining*. Supervisor: J. Tvarožek

- Antal, Andrej: *Spatial Modeling, Relationship and Interactions*. Supervisor: A. Mrázik

- Bako, Peter: *Effective Association and Access to Data of Memory Institutions*. Supervisor: N. Andrejčíková

- Bartal, Kamil: *Usage of Parallel Computing Machine with Shared Memory in Graph Search*. Supervisor: P. Lacko

- Bradáč, Peter: *Model Driven Enterprise Application Integration*. Supervisor: P. Mederly

- Capík, Zdenko: *Complex Event Processing in Event-Driven Applications Development*. Supervisor: J. Lang

- Drahoš, Juraj: *Goalkeeper in Simulated Robotic Soccer*. Supervisor: I. Kapustík

- Eľko, Ľubomír: *Design Patterns Recognition in Existing Software*. Supervisor: Ľ. Majtás

- Ertl, Peter: *Robotic Goalkeeper*. Supervisor: M. Lekavý

- Fojtík, Michal: *Modelling Dynamic Spatial Systems*. Supervisor: A. Mrázik

- Godány, Robert: *User Behavior Modeling for His Identification*. Supervisor: D. Chudá

- Harsányi, Zoltán: *Mashup Development Tool*. Supervisor: V. Rozinajová

- Hlaváč, Ján: *Methods of Intelligent Email Addressing*. Supervisor: M. Laclavík

- Hönsch, Marián: *Virtual Community Detection in Vast Information Spaces*. Supervisor: M. Barla

- Jantošovič, Michal: *The Use of Event Driven Architecture for Solutions Aimed at Ecology*. Supervisor: J. Lang

- Kozák, Andrej: *Parallel Game-Tree Search on GPU*. Supervisor: P. Lacko

- Kuric, Eduard: *Automatic Photo Annotation Based on Visual Content Analysis*. Supervisor: M. Bieliková

- Labaj, Martin: *Recommendation and Collaboration Based on Implicit Feedback*. Supervisor: M. Bieliková

- Líška, Peter: *Support of Refactoring by Using Advanced Algorithms*. Supervisor: I. Polášek

- Lohnický, Michal: *Spatial and Time Navigation in Multimedia*. Supervisor: M. Bieliková

- Lukáč, Branislav: *Portability of Integration Solutions*. Supervisor: P. Mederly

- Majer, Tomáš: *Leveraging Microblogs for Resource Ranking*. Supervisor: M. Šimko

- Mičko, Tomáš: *Aspect-Oriented Frames in Software Product Lines*. Supervisor: V. Vranić

- Mihál, Vladimír: *Relations Discovering in Educational Texts Based on User Created Annotations*. Supervisor: M. Bieliková

- Námešný, Michal: *Refactoring of Object Structures*. Supervisor: I. Polášek

- Nosko, Peter: *Application of Recurrent Neural Networks to Evaluation of Game State*. Supervisor: P. Lacko

- Oláh, Michal: *Recommendation in Multiway Data*. Supervisor: J. Suchal

- Pavlík, Michal: *Certification Authority and Time-Stamp Authority Generating Certificates in the XML Format*. Supervisor: J. Dobias

- Perdík, Pavol: *Using Neural Networks for Reinforcement Learning.* Supervisor: P. Lacko

- Perháč, Ján: *Open Model of Dynamics of Object.* Supervisor: A. Mrázik

- Rakovský, Adrián: *Interactive Information Retrieval in the Semantic Web.* Supervisor: M. Tvarožek

- Rástočný, Karol: *Semantic Web Navigation Based on Adaptive Views.* Supervisor: M. Tvarožek

- Repka, Lukáš: *Parallel Game Tree Search on Cell Broadband Engine Architecture.* Supervisor: P. Lacko

- Sabo, Štefan: *Online Gathering of Information from Text Sources.* Supervisor: A. Bou Ezzeddine

- Študent, Peter: *Using Implicit Feedback in Recommendation Systems.* Supervisor: J. Suchal

- Tóth, Ján: *Archivation of Electronic Signature based on XAdES with Support of Long-Term Verification.* Supervisor: J. Dobias

- Tuček, Vladimír*: Aspect-Oriented Design Pattern Identification.* Supervisor: V. Vranić

- Urbanec, Maroš*: Decision Methods in Three-Dimensional Robotic Soccer.* Supervisor: I. Kapustík

- Valčuha, Matej*: Information Search Considering the User's Interest and Groups of Similar Users.* Supervisor: P. Návrat

- Valo, Jozef: *Implementation of a Software Agent (Bot) for PC Game.* Supervisor: M. Závodský

- Virik, Martin: *Automated Recognition of Writing Style in Blogs.* Supervisor: M. Šimko

- Zdechovan, Ján: A *Contribution to Change Modeling in Aspect-Oriented Way.* Supervisor: V. Vranić

- Zvalo, Jozef: *Parallel Game Tree Search on Multicore Processor with Shared Memory.* Supervisor: P. Lacko

Doctoral (PhD.) Theses

Student name: Michal Barla
Degree program: Software Engineering
Thesis title: *Towards Social-based User Modeling and Personalization*
Supervisor: Mária Bieliková, Professor
Defended on: February 10, 2011
Annotation: As the Web grows and the amount of available information increases, new problems such as information overload or lost-in-hyperspace problem emerge. The solution is to shift from "one-size-fits-all" approach and to provide personalized surfing experience, which would take into account differences among users. These differences are captured in a user model, a structure holding all relevant user-related information. We present contributions in both data collection and processing stages of user modeling process, focusing on open corpus

web-based systems, where the content can be dynamically added or changed and we have no content available in the design stage of the web-based system. We introduce two methods falling within the scope of data collection stage, a method for comprehensive logging of user activity on the Web with preserved semantics, which combines client side and server side logging into a stream of user events with clearly defined meaning, and a method for capturing logs of "wild" Web surfing based on a specialized proxy sever. The second group of methods, devoted to actual user model creation within an open corpus environment, consists of a method for user model inference based on rules expressing navigational patterns, a method for term-based open corpus user modeling, which can be applied to capture user's interest across the third-party web-sites and web-based systems. We proposed also a method for finding relations between terms based on folksonomies, which supports our term-based user modeling approach. The proposed methods were evaluated by means of software tools that were incorporated in research projects on intelligent information presentation.

Student name:	Peter Bartalos
Degree program:	Software Engineering
Thesis title:	*Effective Automatic Dynamic Semantic Web Service Composition*
Supervisor:	Mária Bieliková, Professor
Defended on:	February 10, 2011
Annotation:	Web services are a popular technology used when diverse software system integration is in demand. The ability to make some functionality available through the Web has inspiring consequences. One of the intensively researched areas is the study how Web services can be used to dynamically create a functionality, based on the actual requirements. The basic idea is that multiple Web services can be combined together to form a composite service supplying more complex needs. The composition is realized automatically, on the fly, based on the actual goal. To facilitate this kind of Web service utilization, additional metadata depicting the functionality of single services is required. These metadata are provided in a form of semantic annotations. Our work deals with selected subproblems of the automatic dynamic semantic Web service composition. The sub-problems include the proper description of the behavior of Web services, management of the changes in the service environment, and handling multiple composition requests arriving continuously.

Student name:	Jozef Tvarožek
Degree program:	Software Engineering
Thesis title:	*Bootstrapping a Socially Intelligent Tutoring Strategy*
Supervisor:	Mária Bieliková, Professor
Defended on:	February 10, 2011
Annotation:	We present an approach for computer supported education in the form of a socially intelligent learning environment that is available online. It integrates problem solving and instructional materials into individual and group learning scenarios. A Wizard-of-Oz-driven computer tu-

tor accompanies students to maintain their motivation within the learning environment. The agent can hold off-task conversations and guide students to appropriate learning opportunities. Its tutoring strategy is devised by a reinforcement learning control method that operates on socially motivated state and action spaces induced by the human wizard whose interface facilitates rapid prototyping of relevant states and taking appropriate actions. To make the learning algorithm feasible, states are grouped into equivalence classes according to wizard selected state features, and contextual and linguistic reection is employed to adjust the immediate action to the current learner's situation. The feasibility study of the socially intelligent agent demonstrated that students who engaged with the agent attained higher learning gains and liked the system more. The bootstrapping of the socially intelligent tutoring strategy was evaluated in simulated student scenarios. Evaluations suggest that our approach for using computers to support students in the learning process is technologically viable.

Student name:	Michal Tvarožek
Degree program:	Software Engineering
Thesis title:	*Exploratory Search in the Adaptive Social Semantic Web*
Supervisor:	Mária Bieliková, Professor
Defended on:	February 10, 2011
Annotation:	Effective search and access to information on the Web and the Semantic Web is still an open problem with direct consequences for our society. We improve the current state of the art in information access capabilities by devising an original multi-paradigm exploratory search approach combining keyword-based, view-based and content-based search with advanced visualization approaches including graph visualization and specialized result overviews. We address information overload and the navigation problem via personalization of navigation and presentation, and orientation and guidance support via facet, restriction and result recommendation for individual users. The access to Semantic Web information is facilitated by dynamic user interface generation using descriptive metadata about the structure of the information space, and using visual semantic query construction. We successfully validated the usefulness and practicality of the proposed approaches in multiple domains including job offers, scientific publications and digital images.

Student name:	Ľubomír Majtás
Degree program:	Software Engineering
Thesis title:	*Contribution to the Creation and Recognition of the Design Patterns Instances*
Supervisor:	Pavol Návrat, Professor
Defended on:	March 15, 2011
Annotation:	Design patterns introduced very useful way of improving the quality of the software development processes. There were introduced several solutions trying to support developers with their utilization. In our work we will describe two approaches supporting their employment: first one is dealing with their instantiation, the second one is dealing

with their recognition in the existing source code. Our first approach presents the support for pattern instance creation in semi automatic way. The main idea of this approach is that the developer should suggest the pattern occurrence and specify the desired variants of the pattern he wishes to employ. The valid pattern instance customized to meet all user requirements in the most ideal way will be created by the CASE tool. The second approach focuses on improvement of the recognition processes that often suffer by too high false-positive recognition ratio (they mark some code fragments as the pattern instance, but in reality they are not). To reduce this ratio we have incorporated the dynamic analysis that is being focused of examination of the system execution into the overall recognition process.

Student name:	Anna Bou Ezzeddine
Degree program:	Applied Informatics
Thesis title:	*Web Information Retrieval Inspired by Social Insect Behaviour*
Supervisor:	Pavol Návrat, Professor
Defended on:	March 24, 2011
Annotation:	This work is focused on retrieving information from Web, which represents the biggest source of information that could be used by human. In the process of retrieving effective information, new approaches have been established by using different principles and theories. Methods of solving problems inspired by nature or biologically are used in Informatics more frequently. Their potention in proposing new and making the wellknown methods of solving various kinds of problems more effective confirms. Inspired by social insect´s behaviour and following the analysis of information mentioned in several publications we proposed an upgrading of a selected bee hive model used for retrieving information in our work. In our work we used an adapted model in order to follow a developing story that represents a new approach in retrievng information. In this case the time of publishing the story is also important according to the event it is connected to. In order to retrieve an increased number of documents of bigger quality in the process of searching, we proposed a hierarchical interconnection among several bee hive models.

Student name:	Pavol Mederly
Degree program:	Software Engineering
Thesis title:	*Semi-Automated Construction of Megessaging-Based Enterprise Application Integration Solutions*
Supervisor:	Pavol Návrat, Professor
Defended on:	September 30, 2011
Annotation:	Enterprise application integration, i.e. an endeavor to make independently developed information systems cooperate, is an important topic of enterprise computing for decades. Despite many efforts, both in industry and academic area, integration solutions development is still often a costly, error-prone process. The goal of this dissertation is to make messaging-based integration solutions development and maintenance more efficient. In comparison to existing model-driven approaches that aim to generate code for integration solutions we are

trying to reach a more advanced goal: to automate not only the code generation but the detailed design as well. In order to do this, we use artificial intelligence techniques, namely planning and constraint satisfaction. In this dissertation we present a set of methods that – for a given integration solution abstract design and non-functional requirements (like throughput, availability, monitoring, minimal communication middleware usage, and so on) – create a suitable solution design and in some cases an executable code as well.

Student name:	Matej Košík
Degree program:	Software Engineering
Thesis title:	*A Contribution to Techniques for Building Dependable Operating Systems*
Supervisor:	Jiří Šafařík, Professor
Defended on:	September 30, 2011
Annotation:	Even though development of a new operating system is rarely a good (business) plan, in a small scale it could be a fruitful experiment in software engineering. In this document we describe results of our effort to build a dependable operating system. By adopting and building upon recent advances in the programming language design, we show one possible way how can we reduce development costs of dependable (operating) systems. During the course of our work, we focused primarily on aspects that cannot be added as an afterthought, e.g. dependability of the operating system rather than those which can be added anytime in the future, e.g. rich services of the operating system.

9.4 IIT.SRC Students' Papers

Full papers

– Abelovský, Peter: *Feature-Based Opinion Mining*. Supervisor: J. Tvarožek

– Basár, Peter: *Multicriteria Recommendation of Web Content in Social Networks*. Supervisor: M. Barla

– Bielik, Pavol – Krátky, Peter – Mitrík, Štefan – Tomlein, Michal: *Motivating Children to Increase Physical Activity by Means of Reward*. Supervisor: M.Barla

– Čapla, Róbert: *Improving Flexibility of the Bee Hive Metaphor for Web Search by Adding New Parameter and Modifying Dispatching Strategy*. Supervisor: P. Návrat

– Eľko, Ľubomír: *Design Patterns Recognition in Existing Software*. Supervisor: Ľ. Majtás

– Habudová, Nikoleta: *Representation and Pattern Matching Techniques for Music Data*. Supervisor: P. Návrat

– Holub, Michal: *Information Integration in the Domain of News Articles*. Supervisor: M. Bieliková

– Hopko, Andrej: *Multilinear Supervised Dimensionality Reduction Model for Binary Data*. Supervisor: J. Mažgut

– Hönsch, Marian: *Detecting User Communities Based on Latent and Dynamic Interest on a News Portal*. Supervisor: M. Barla

- Horváth, Róbert: *Supporting Term Explanation while Browsing in Slovak.*
  Supervisor: M. Šimko

- Jačala, Martin: *An Approach to Named Entity Disambiguation Based on Explicit Semantics.* Supervisor: J. Tvarožek

- Janík, Ján: *Complex Event Processing in Reactive Distributed Systems.*
  Supervisor: J. Lang

- Jesenský, Michal: *Information System for Scheduling Optimizations Based on MAS Technology.* Supervisor: I. Budinská

- Kajsa, Peter: *Semantic Annotation as Tool for Correct Reverse Transformations and Design Patterns Identification.* Supervisor: P. Návrat

- Kasan, Michal: *Combining AI Planning and Workflow Approaches in Rule-Based Semi-Automatic Web Services Composition.* Supervisor: V. Rozinajová

- Klinovský, Michal: *Keywords Extraction from Internet Discussions.*
  Supervisor: T. Kuzár

- Kompan, Michal: *News Articles Classification Based on Vector Representation Including Words´ Collocations.* Supervisor: M. Bieliková

- Korduliak, Robert: *Using Web Service Composition Approaches in eTourimsm Domain.* Supervisor: M. Lekavý

- Kramár, Tomáš: *Detecting Search Sessions Using Document Metadata and Implicit Feedback.* Supervisor: M. Bieliková

- Kučečka, Tomáš: *Obfuscating Plagiarism Detection - Vulnerabilities and Solutions.*
  Supervisor: D. Chudá

- Kuric, Eduard: *Automatic Photo Annotation Based on Visual Content Analysis.*
  Supervisor: M. Bieliková

- Labaj, Martin: *Recommendation and Collaboration Based on Implicit Feedback in Web-Based Learning.* Supervisor: M. Bieliková

- Lackovič, Ľubomír: *Parallel Game Tree Search Using GPU.* Supervisor: P. Lacko

- Lohnický, Michal: *An Approach to Photo Album Visualization as a Collection of Memories and Experiences.* Supervisor: M. Bieliková

- Majer, Tomáš: *Leveraging Microblogs for Resource Ranking.*
  Supervisor: M. Šimko

- Mederly, Pavol: *A Method for Creating Messaging-Based Integration Solutions and its Evaluation.* Supervisor: P. Návrat

- Mičko, Tomáš: *Towards Language Independent Aspect-Oriented Frames.*
  Supervisor: V. Vranić

- Mihál, Vladimír: *Relations Discovering in Educational Texts Based on User Created Annotations.* Supervisor: M. Bieliková

- Mikluš, Miroslav: *CIDOC-CRM and its Application in the Environment of the Slovak National Gallery.* Supervisor: N. Andrejčíková

- Móro, Róbert - Srba, Ivan - Unčík, Maroš: *The Role of Tags in Personalized Web-Based Learning 2.0.* Supervisors: M. Bieliková, M. Šimko

– Nagy, Balázs: *Acquisition of Semantic Metadata via Interactive Games.* Supervisor: M. Tvarožek

– Paulovič, Aurel: *Bee Nest-Site Selection Clustering.* Supervisor: P. Návrat

– Rakovský, Adrián: *Interactive Information Retrieval in the Semantic Web.* Supervisor: M. Tvarožek

– Rástočný, Karol: *Semantic Web Navigation Based on Adaptive Views.* Supervisor: M. Tvarožek

– Suchal, Ján: *Improving News Recommendations with Implicit Negative Feedback.* Supervisor: P. Návrat

– Súkeník, Ján: *Solving of Image Similarity Puzzle - Singular Value Decomposition.* Supervisor: P. Lacko

– Ševcech, Jakub: *Automatic Web Content Annotation.* Supervisor: M. Bieliková

– Šimko, Jakub: *Augmenting Lightweight Semantics.* Supervisor: M. Bieliková

– Šimko, Marián: *Hybrid Approach to Automated Domain Model Creation for Adaptive Social Learning System.* Supervisor: M. Bieliková

– Uhlík, Martin: *The Similarity Detection in Slovak Texts by Compression Method.* Supervisor: D. Chudá

– Zdechovan, Ján*: Improving Aspect-Oriented Change Modeling with Reusable Aspect Models.* Supervisor: V. Vranić

– Zeleník, Dušan: *An Approach to Context Aware Event Reminding.* Supervisor: M. Bieliková

Extended abstracts

– Fejes, Máté: *Concept-Cloud Navigation in Educational Web-Based System.* Supervisor: M. Bieliková

– Harsányi, Zoltán: *Mashup Development Tool.* Supervisor: V. Rozinajová

– Jantošovič, Michal: *Feature Implementation Based on Complex Event Processing.* Supervisor: J. Lang

– Krajčovič, Vladimír: *A Way of Using Complex Event Hierarchies in Curricula Modelling.* Supervisor: J. Lang

– Kumor, Andrej: *The Influence of Readability Index for Determining the Similarity in Texts.* Supervisor: D. Chudá

– Táborský, Roman: *Towards a Stepwise Generative Approach Based on Feature Modeling.* Supervisor: V. Vranić

– Urbanec, Maroš: *Reprogramming a Robot on the Fly.* Supervisor: I. Kapustík

– Virik, Martin: *Recognizing Writing Style in Slovak Blogs.* Supervisor: M. Šimko

TP CUP Competition

– Auder, Miloš – Belica, Andrej – Ďurčák, Lukáš – Mikuláš, Miroslav – Paššák, Martin – Romaňák Ján: *Heuristic Evolutionary Rule-Based Artificial Life.* Supervisor: P. Bartoš

-   Barát, Michal – Benčič, Anton – Svorada, Peter – Šajgalík, Márius: *Heritage – a New Way of Solution Awareness through Innovative Gameplay.*
    Supervisor: M. Tvarožek

-   Hudek, Ján – Pleško, Ivan – Sokol, Pavol – Spusta, Juraj: *Web Personalisation through Adaptive Proxy Server.* Supervisor: M. Barla

-   Kanta, Marcel – Krajník, Peter – Kumor, Andrej – Šoka, Milan – Topoľský, Ondrej – Zboroň, Lukáš: *Usermodel for User Identification.* Supervisor: D. Chudá

9.5 Research Laboratories

Intelligent Systems Laboratory

Manager:	P. Návrat
Contact:	`pavol.navrat@stuba.sk`
Description:	The laboratory is used for research of a wide spectrum of problems that fall into the field of program and information systems mainly in the scope of artificial intelligence. The projects solved are concerned with the methods of knowledge system development with a special focus on multi-agent systems and their collaboration, as well as intelligent search, delivery, and presentation of heterogeneous information in a distributed environment such as Internet, including categorisation and recommendation of the information. The laboratory is equipped with fairly powerful computer systems and advanced software tools that correspond to the demands of the projects being solved. The equipment is regularly renewed thanks mainly to continuous success in grants including international ones.

Advanced Software and Web Technologies Laboratory

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

Mobile Computing Laboratory

Manager:	V. Vranić (UISI), M. Čerňanský (UAPI), I. Kotuliak (UPSS)
Contact:	`valentino.vranic@stuba.sk`
Description:	The main purpose of the laboratory is to support research and teaching process related to mobile computing. Laboratory supports research and student projects from multiple domains that can greatly benefit

from mobile computing technology such as computer vision, computer graphics, machine learning and augmented reality. Currently the laboratory equipment consists of several iOS mobile phone and tablet PC devices (Apple iPhone, Apple iPad) and computers used for development applications for mobile devices. In near future laboratory will be equipped with devices running Android (Google), Symbian OS (Nokia) and eventually other major mobile computing platforms (Windows Phone 7, RIM Blackberry, Samsung Bada).

9.6 Research Projects

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

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

Adaptive Social Web and its Services for Information Accessing and Search (VEGA, 1/0508/09)

Project leader:	P. Návrat
Members UISI:	M. Bieliková, A. Bou Ezzeddine, D. Chudá, I. Kapustík, J. Lang, I. Polášek, V. Rozinajová, V. Vranić, M. Barla, P. Bartalos, P. Kajsa, M. Kasan, T. Kuzár, Ľ. Majtás, P. Mederly, J. Suchal, M. Šimko, P. Vojtek, J. Tvarožek, M. Tvarožek
Supported by:	Scientific Grant Agency of the Ministry of Education of Slovak Republic and the Slovak Academy of Sciences
Duration:	January 2009 – December 2011
Description:	Web is evolving, changing, which itself requires a need of its further exploration. It becomes a place to mutual communication of people, what can be used to design of new methods of searching, classification or presentation information from web. Besides new methods will take more and more into account the context, in which the retrieval is realized. Project is focused on research of methods of information retrieval and way if its usage/utilization. In this framework, the concept of semantic web service will be elaborated. Important part of research of automated data collecting about user activities and user groups collab-

oration on web with the aim to offer better information services. We shall seek new approaches to develop software tools for support of adaptive social web paradigm and its services including post-object paradigms, model-driven development (MDD), web design patterns, which can allow more effective implementation of software information systems acting in web environment.

Contextual information search and navigation in the social web (VEGA, 1/0675/11)

Project leader:	M. Bieliková
Members UISI:	M. Barla, L. Borženský, M. Holub, I. Kapustík, M. Kasan, M. Kompan, T. Kramár, P. Lacko, P. Michlík, P. Návrat, V. Rozinajová, J. Šimko, M. Šimko, J. Tvarožek, M. Tvarožek, V. Vranić, D, Zeleník
Supported by:	Scientific Grant Agency of the Ministry of Education of Slovak Republic and the Slovak Academy of Sciences
Duration:	January 2011 – December 2014
Description:	Considering today's information overload, caused by mass and dynamics of the accessible information, effective information search and navigation becomes an important and crucial task during activities with information needs. Project focuses on research of methods and techniques for information searching and navigation and on ways of their realization in the milieu of adaptive and social web with semantics with regard to problem-related software architectures (esp. service oriented architectures) methods of distributed provessing of extensive data sources and to model-driven development of software including post-object paradigms.

Acquiring, processing and visualization of textual information based on analysis of similarity relations (VEGA, 1/0971/11)

Project leader:	D. Chudá
Members UISI:	N. Andrejčíková, M. Bieliková, A. Bou Ezzeddine, R. Čapla, P. Kajsa, G. Kosková, T. Kučečka, T. Kuzár, J. Lang, Ľ. Majtás, P. Mederly, P. Návrat, I. Polášek, J. Suchal, R. Šelmeci
Supported by:	Scientific Grant Agency of the Ministry of Education of Slovak Republic and the Slovak Academy of Sciences
Duration:	January 2011 – December 2014
Description:	Web data acquisition is a highly topical task and despite several well-known methods, users struggle with poor quality (accuracy, relevance, and coverage) responses. The problem is to find methods to obtain relevant information on an issue that has a dynamic character, i.e. evolves over time. Acquired documents can be mined for more information. In particular, new approaches (neural networks, swarm intelligence) are being researched. Attention is drawn to methods which process Slovak texts. Recommendations of relevant or interesting information are studied together with non-standard versions of similarity. Relationships between the versions, originality, authorship, and originality are being evaluated. Methods take into account that the user can be a part of social networks. The proposed methods will be used in various systems of information processing including e-learning. Software structures which support interoperability of such systems and composition of provided services are being designed.

Social Intelligent Recommendation for Learning
(KEGA, 028-025STU-4/2010)

Project leader:	M. Bieliková
Members UISI:	M. Barla, A. Bou Ezzeddine, D. Chudá, T. Kramár, J. Lang, P. Michlík, P. Návrat, I. Polášek, A. Považanová, V. Rozinajová, V. Vranić, J. Suchal, M. Šimko, J. Tvarožek, M. Tvarožek
Supported by:	Cultural and Educational Grand Agency of the Ministry of Education of Slovak Republic
Duration:	January 2010 – December 2011
Description:	The project aims to develop novel methods and techniques for learning based on social relationships and intelligent recommendation within a learning environment. The relationships representing student interests explicitly as well as the implicit relationships emerging from a learning process will be utilized. The latter ones allow for a dynamic group formation for effective task solving, learning materials enrichment by means of collaboration and social annotation and/or intelligent recommendation of learning objects based on social relations and folksonomies together with an effective navigation through an educational course. The outcome of the project is an evaluation of proposed methods in domain of learning programming based on emerging Web 2.0 and Semantic Web technologies. Besides the methods, the learning materials for programming learning are created, which can be reused in different learning environments by other universities.

Support of Plagiarism Prevention in E-Learning of Informatics
(KEGA-345-032STU-4/2010)

Project leader:	D. Chudá
Members UISI:	M. Bieliková, I. Dekýšová, A. B. Ezzeddine, D. Chudá, I. Kapustík, T. Kuzár, J. Lang, P. Návrat, I. Polášek, B. Steinmüller, J. Suchal, M. Šimko
Supported by:	Cultural and Educational Grand Agency of the Ministry of Education of Slovak Republic
Duration:	January 2010 – December 2011
Description:	Plagiarism is a growing threat, especially at universities where it can be a highly demotivating factor both for teachers and students. Therefore, there are efforts to detect it and to reduce its occurrence. Plagiarism is a common problem that appears in various areas of our lives. Often, we learn about stolen ideas and disputes about them may even end up in court. The project aims to design new methods for solving the complex problem of the process of collection and monitoring student assignments and detecting them to avoid plagiarism.

Virtual and constructive modelling, training and simulation of crowd behaviour in urban environment (APVV-0233-10)

Project leader:	P. Lacko for FIIT STU
Members UISI:	I. Kapustík, P. Mederly, A. Paulovič, M. Svrček, V. Vranić
Supported by:	Slovak Research and Development Agency
Duration:	May 2011 – October 2014

Description: Project objective is to develop a virtual training and simulation environment for the training and multi-agent simulation of security forces and crowds in urban environment. Users will be able to create new or adapt the existing models of human behaviour in line with the latest findings of psychology and sociology. Project is aimed to enhance the safety at public events by the realistic simulation of the employment of modern equipment Božena-Riot meant for crowd management and riot control (primarily by the police, but also by the army), which is developed and produced in Slovakia by the project partner Way Industries. Though the primary application area is security and crowd-management, the mul-agent simulation components are universal and can also be used in educational, economical, sociological or epidemiological modelling.

Cognitive traveling in digital space of the Web and digital libraries supported by personalized services and social networks (APVV-0208-10)

Project leader: P. Návrat
Members UISI: N. Andrejčíková, M. Barla, M. Bieliková, P. Bartalos, A. Bou Ezzeddine, D. Chudá, G. Kosková, T. Kuzár, P. Lacko, V. Rozinajová, J. Suchal, M. Šimko, J. Tvarožek, M. Tvarožek
Supported by: Slovak Research and Development Agency
Duration: May 2011 – October 2014
Description: Analyzing new phenomena connected with using web and digital libraries (esp. social networking) to improve information acquisition. Devising and verifying: - new models of information domains, documents and users facilitating expressing and working with at least partial descriptions of their semantics - new methods of targeted and exploratory information serach that take into account personalization, common interests of different groups, suitable presentation and visualization.

Support of Building a Center of Exellence for Smart Technologies, Systems, and Services (ITMS 26240120005)

Project leader: M. Bieliková for FIIT STU
Members UISI: P. Návrat
Supported by: European Structural Fund
Duration: May 2009 – April 2011
Description: The project aims at following: concentration of the top research-educational teams of smart technologies, systems, and services in Bratislava region; improving the quality of technological infrastructure and smart technology development of systems and services including the information and communication infrastructure modernization; improving effectiveness of the know-how transfer between academy and industry sphere in the area of smart technologies, systems, and services; improving integration into international cooperation in research and development in the field of smart technologies.

Support of Building a Center of Excellence for Smart Technologies, Systems, and Services II (ITMS 26240120029)

Project leader:	M. Bieliková for FIIT STU
Members UISI:	P. Návrat
Supported by:	European Structural Fund
Duration:	January 2010 – January 2013
Description:	The objective is to improve, build further, and put into operation the technological infrastructure that would enable to sustain the center of excellence of research and development for enterprise information source processing and presentation with the application of advanced distributed architectures for parallel processing of extensive sources of semistructured data and high performance computing for complex applications.

Research of methods for acquisition, analysis and personalized conveying of information and knowledge (ITMS: 26240220039)

Project leader:	M. Bieliková for FIIT STU
Members UISI:	M. Barla, M. Bieliková, A. Bou Ezzeddine, D. Chudá, M. Holub, M. Kompan, G. Kosková, T. Kramár, T. Kučečka, P. Lacko, P. Mederly, P. Návrat, I. Polášek, V. Rozinajová, J. Suchal, R. Šelmeci, J. Šimko, M. Šimko, J. Tvarožek, M. Tvarožek, V. Vranić, D. Zeleník
Supported by:	European Structural Fund
Duration:	January 2011 – January 2014
Description:	The purpose of the project is to develop new methods of acquisition, search, and recommendation of information and knowledge. The need for such methods comes from a huge range of the data available in different domains when their manual search for a human is not possible. Contemporary methods have enabled a remarkable move in this field, but they still do not enable to effective information providing so that this would include the context: the user, his or her goals, properties, and capabilities, as well as parameters of the environment in which information processing takes part (time, place, and technical resources).

Personalization of physical activity to fight against childhood obesity (2010et018)

Project leader:	M. Barla
Members UISI:	P. Bielik, P. Krátky, Š. Mitrík, M. Tomlein (students)
Supported by:	Tatra banka Foundation
Duration:	January 2011 – December 2011
Description:	The project deals with a worldwide problem — the lack of physical activity resulting in overweight, obesity and other severe diseases. It's aim is to take advantage of modern information technologies to motivate people to do more physical activity and to improve their lifestyle. This is done by tracking and evaluating users' activity, providing feedback and personalized recommendations of activity and, above all, providing various means of motivation based also on principles of gamification.

9.7 Publications

Journals

BARTALOS, P. - BIELIKOVÁ, M.: Automatic Dynamic Web Service Composition: A Survey and Problem Formalization. In: *Computing and Informatics*. Vol. 30, No. 4 (2011), ISSN 1335-9150, pp. 793-827.

BIELIKOVÁ, M. - NÁVRAT, P.: Preface to Special Section on Student Research in Informatics and Information Technologies. In: *Information Sciences and Technologies Bulletin of the ACM Slovakia*. Vol. 3, No. 2 (2011), ISSN 1338-1237, pp 26-27.

HOLUB, M. - BIELIKOVÁ, M.: An Inquiry into the Utilization of Behavior of Users in Personalized Web. In: *Journal of Universal Computer Science*. Vol. 17, No. 13 (2011), ISSN 0948-6968, pp. 1830-1853.

HOLUB, M.: Information Integration in News Articles from Various Sources. In: *Information Sciences and Technologies Bulletin of the ACM Slovakia*. Vol. 3, No. 2 (2011), ISSN 1338-1237, pp. 42-46.

JAČALA, M.: An Approach to Named Entity Disambiguation Based on Explicit Semantics. In: *Information Sciences and Technologies Bulletin of the ACM Slovakia*. Vol. 3, No. 2 (2011), ISSN 1338-1237, pp. 55-58.

KAJSA, P. - MAJTÁS, Ľ. - NÁVRAT, P.: Design Pattern Instantiation Directed by Concretization and Specialization. In: *Computer Science and Information Systems*. Vol. 8, No. 1 (2011), ISSN 1820-0214, pp. 41-72.

KRAMÁR, T.: Session Segmentation Based on Document Metadata. In: *Information Sciences and Technologies Bulletin of the ACM Slovakia*. Vol. 3, No. 2 (2011), ISSN 1338-1237, pp. 64-66.

KUČEČKA, T.: Plagiarism Detection in Obfuscated Documents Using an N-gram Technique. In: *Information Sciences and Technologies Bulletin of the ACM Slovakia*. Vol. 3, No. 2 (2011), ISSN 1338-1237, pp. 67-71.

KURIC, E.: Automatic Photo Annotation Based on Visual Content Analysis. In: *Information Sciences and Technologies Bulletin of the ACM Slovakia*. Vol. 3, No. 2 (2011), ISSN 1338-1237, pp. 72-75.

LABAJ, M.: Web-Based Learning Support Based on Implicit Feedback. In: *Information Sciences and Technologies Bulletin of the ACM Slovakia*. Vol. 3, No. 2 (2011), ISSN 1338-1237, pp. 76-78.

LACKO, P. - STEINMÜLLER, B. - BIELIKOVÁ, M.: Distributed Computing or New Computer Cluster at FIIT STU. In: *Spektrum*. Vol. 17, No. 7 (2011), ISSN 1336-2593, pp. 14-15. (in Slovak)

LÍŠKA, M. - NÁVRAT, P.: SPEM Ontology as the Semantic Notation for Method and Process Definition in the Context of SWEBOK. In: *Computer Science and Information Systems*. Vol. 8, No. 2 (2011), ISSN 1820-0214, pp. 299-315.

MEDERLY, P. A Method for Creating Messaging-Based Integration Solutions. In: *Information Sciences and Technologies Bulletin of the ACM Slovakia*. Vol. 3, No. 2 (2011), ISSN 1338-1237, pp. 91-95.

RÁSTOČNÝ, K.: Navigation Based on Adaptive Views. In: *Information Sciences and Technologies Bulletin of the ACM Slovakia*. Vol. 3, No. 2 (2011), ISSN 1338-1237, pp. 104-108.

ŠEVCECH, J.: Mapping Words between Slovak Text and its Translation to English. In: *Information Sciences and Technologies Bulletin of the ACM Slovakia*. Vol. 3, No. 2 (2011), ISSN 1338-1237, pp. 113-115.

ŠIMKO, J.: Augmenting Human Computed Lightweight Semantics. In: *Information Sciences and Technologies Bulletin of the ACM Slovakia*. Vol. 3, No. 2 (2011), ISSN 1338-1237, pp. 116-118.

ŠIMKO, M.: Automated Domain Model Creation for Adaptive Social Educational Environments. In: *Information Sciences and Technologies Bulletin of the ACM Slovakia*. Vol. 3, No. 2 (2011), ISSN 1338-1237, pp. 119-121.

ŠIMKO, J. - TVAROŽEK, M. - BIELIKOVÁ, M.: Semantics Discovery via Human Computation Games. In: *International Journal on Semantic Web and Information Systems*. Vol. 7, No. 3 (2011), ISSN 1552-6283, pp. 23-45.

TVAROŽEK, M.: Exploratory Search in the Adaptive Social Semantic Web. In: *Information Sciences and Technologies Bulletin of the ACM Slovakia*. Vol. 3, No. 1 (2011), ISSN 1338-1237, pp. 42-51.

International Conferences

BAČA, P. - VRANIĆ, V.: Replacing Object-Oriented Design Patterns with Intrinsic Aspect-Oriented Design Patterns. In: *ECBS-EERC 2011*. Proceedings of 2nd Eastern European Regional Conference on the Engineering of Computer-Based Systems, Bratislava, Slovakia, Los Alamitos IEEE Computer Society, 2011, pp. 19-25.

BÁLIK, J. - VRANIĆ, V.: Sustaining Composability of Aspect-Oriented Design Patterns in Their Symmetric Implementation. In: *ESCOT 2011*. 2nd Workshop on Empirical Evaluation of Software Composition Techniques, Lancaster, UK, 2011. (online)

BARTALOS, P. - BIELIKOVÁ, M.: Composition and Undesired Web Service Execution Effects. In: *SYNASC 2010*. Proceedings of 12th international symposium on symbolic and numeric algorithms for scientific computing, Timisoara, Romania, Los Alamitos IEEE Computer Society, 2011, pp. 549-552.

BENČIČ, A. - ŠAJGALÍK, M. - BARLA, M. - BIELIKOVÁ, M.: An Approach to Intelligent Interactive Social Network Geo-Mapping. In: *Lecture Notes in Computer Science*. Vol. 6804 Foundations of Intelligent Systems, 19th International Symposium, ISMIS 2011, Warsaw, Poland, Springer-Verlag Berlin Heidelberg, 2011, ISSN 0302-9743, pp. 612-621.

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LACKO, P. - KVASNIČKA, V.: Neural Networks Used for Board Game Play. In: *Artificial Intelligence and Cognitive Science III*. Bratislava STU, 2011, ISBN 978-80-227-3542-1, pp. 117-162.

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BIELIKOVÁ, M. - NÁVRAT, P. - BARLA, M. - TVAROŽEK, J. - TVAROŽEK, M.: *Personalized Web-Science, Technologies and Engineering*. Proceedings of 9th Spring 2011 Pe-

We Workshop, Viničné, Galbov Mlyn, Slovakia, Bratislava STU, 2011, ISBN 978-80-227-3485-1, 93 p.

BIELIKOVÁ, M.: *Student Research Conference 2011, Vol. 1.* Proceedings of 7th Student Research Conference in Informatics and Information Technologies, Bratislava, Slovakia, STU Press, 2011, ISBN 978-80-227-3484-4, 276 p.

BIELIKOVÁ, M.: *Student Research Conference 2011, Vol. 2.* Proceedings of 7th Student Research Conference in Informatics and Information Technologies, Bratislava, Slovakia, STU Press, 2011, ISBN 978-80-227-3488-2, pp. 279-540.

EDER, J. - BIELIKOVÁ, M. - TJOA, A. M.: *Lecture Notes in Computer Science.* Vol. 6909 Advances in Databases and Information Systems. Proceedings of 15th International al Conference, ADBIS 2011, Vienna, Austria, September 20-23, 2011 Springer-Verlag Berlin Heidelberg, 2011, ISBN 978-3-642-23736-2, 462 p.

EDER, J. - BIELIKOVÁ, M. - TJOA, A. M.: *ADBIS 2011.* Research Communications, Proceedings II of the 15th East-European Conference on Advances in Databases and Information Systems, Vienna, Österreichische Computer Gesselschaft, 2011, ISBN 978-3-85403-285-4, 285 p.

KVASNIČKA, V. - POSPÍCHAL, J. - NÁVRAT, P. - LACKO, P. - TREBATICKÝ, P.: *Artificial Intelligence and Cognitive Science III.* Bratislava, Slovakia, STU Press, 2011, ISBN 978-80-227-3542-1, 385 p.

POPOVIĆ, M. - VRANIĆ, V.: *ECBS-EERC 2011.* Proceedings of 2nd Eastern European Regional Conference on the Engineering of Computer-Based Systems, Bratislava, Slovakia, Los Alamitos IEEE Computer Society, 2011, ISBN 978-0-7695-4418-2. CD-ROM.

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BIELIKOVÁ, M.: Introduction to Webometrics: Quantitative Web Research for the Social Sciences. In: *ACM Computing Reviews.* Vol. 52, No. 10 (2011), ISSN 0010-4884, pp. 599.

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9.8 Cooperation

Cooperation in Slovakia

– Institute of Informatics, Slovak Academy of Sciences, Bratislava

– Institute of Informatics, Faculty of Science, Pavol Jozef Šafárik University in Košice

– Faculty of Electrical Engineering and Information Technologies Technical University of Košice

– Faculty of Management Science and Informatics, University of Žilina

– Ditec

- Datalan
- Gratex International
- GBSW.
- Hewlett-Packard Slovakia
- IBM Slovakia
- Microsoft Slovakia
- Nokia Slovakia
- Oracle Slovakia
- PosAm
- Siemens
- SOFTEC
- Soitron
- Slovak Telecom
- Tempest
- Unicorn

International Cooperation

- MIR Labs, Machine Intelligence Research Labs, global not-for-profit academic consortium oriented to innovation and research in various areas of machine intelligence. The Institute is part of the MIR Labs Network with Pavol Návrat serving as coordinator for Slovakia.
- WIC, Web Intelligence Consortium, an international not-for-profit organisation devoted to scientific research and industry development in the area of web intelligence. The Institute plays a role of Slovak Research Centre of the Consortium.
- AOSD-Europe, integrates and coordinates research, education and dissemination activities of its members in the area of aspect oriented development of software. Originally, it has been a 7. Framework Programme project.
- School of Information Sciences, University of Pittsburgh, Pittsburgh, USA
- Department of Computers, Faculty of Electrical Engineering, Czech Technical University in Prague, Czech Republic
- Institute of Information Systems, Faculty of Information Technologies, Brno University of Technology, Czech Republic
- Institute of Intelligent Systems, Faculty of Information Technologies, Brno University of Technology, Czech Republic
- Department of Computers, Faculty of Applied Science, University of West Bohemia in Pilsen, Czech Republic
- Department of Computer Science, Faculty of Electrical Engineering and Computer Science, Technical University of Ostrava, Czech Republic
- Faculty of Informatics, Masaryk University, Brno, Czech Republic

- Department of Software Engineering, Faculty of Mathematics and Physics, Charles University in Prague, Czech Republic

- UNESCO–Division of Information and Informatics, Paris, France

- University of Maribor, Slovenia

- Division of Computer Science, National Technical University of Athens, Greece

- Department of Information and Communication Systems Engineering, University of the Aegean, Greece

- University of Hannover, L3S Research Center, Hannover, Germany

- Institute of Computer Science, Faculty of Philosophy and Natural Sciences, Silesian University in Opava, Czech Republic

- Lancaster University, United Kingdom

- Faculty of Electrical and Electronic Engineering and Automation, University of Rousse, Bulgaria

- Faculty of Sciences, University of Novi Sad, Serbia

Visits of Staff Members

- *D. Chudá:* ETN TRICE project meeting, Tenerife, Spain, January 29 - February 2, 2011

- *M. Šimko:* ACM SIGCSE 2011, Dallas, Texas, USA, March 8-15, 2011

- *D. Zeleník:* WEBIST 2011, 7th International Conference on Web Information Systems and Technologies, Noordwijkerhout, The Netherlands, May 5-10, 2011

- *Ľ. Molnár:* International Mother Language Day, UNESCO, Beograd, Serbia, February 18-19, 2011

- *V. Vranić*: Forum Nokia QtQuick for Mobile Training, Budapest, Hungary, March 3-4, 2011

- *Ľ. Molnár:* 186th session of the Executive Board, UNESCO, Paris, May 3-12, 2011

- *J. Šimko:* Hypertext 2011, June 4-10, 2011

- *Ľ. Molnár:* EDUsummIT 2011, UNESCO, Paris, June 7-10, 2011

- *D. Chudá, T. Kučečka, M. Lučanský, P. Návrat:* CompSysTech 2011, Vienna, Austria, June 16-17, 2011

- *M. Bieliková, V. Rozinajová:* Faculty of Information Technology, Brno University of Technology, Czech Republik, June 22, 2011

- *D. Chudá, P. Návrat, V. Vranić:* Faculty of Information Technology, Brno University of Technology, Czech Republic, June 23, 2011

- *M. Bieliková:* Faculty of Ma thematics and Physics, Charles University in Prague, Czech Republik, June 22-23, 2011

- *M. Bieliková:* TC2 annual meeting, Zurich, Switzerland, June 26-29, 2011

- *M. Barla:* ISMIS 2011, 19th International Symposium on Methodologies for Intelligent Systems. Warsaw, Poland, June 27 – July 1, 2011

- *J. Tvarožek, M. Šimko:* ED-MEDIA 2011, World Conference on Educational Multimedia, Hypermedia & Telecommunications, Lisboa, June 27-July 2, 2011

- *M. Bieliková, M. Tvarožek.:* Imagine Cup Finals, New York, USA, July 7-17, 2011
- *M. Barla, T. Kramár:* UMAP 2011, User Modeling, Adaptation and Personalization, Girona, Spain, July 10 -17, 2011
- *M. Bieliková:* Cyprus University of Technology, Limassol, Cyprus, July 22-24, 2011
- *V. Vranić:* ECOOP 2011, 25th European Conference on Object-Oriented Programming, Lancaster, United Kingdom, July 23-30, 2011
- *M. Holub:* 7th Reasoning Web Summer School 2011, Galway, Ireland, August 22-27, 2011
- *M. Bieliková, T. Kuzár, R. Móro, P. Návrat, K. Rástočný, J. Ševcech, M. Tvarožek:* WI/IAT 2011, 2011 IEEE/WIC/ACM International Conference on Web Intelligence, Lyon, France, August 20-26, 2011
- *D. Chudá:* E-learning 2011 & ETN TRICE meeting, Bucharest, Romania, August 24-27, 2011
- *T. Kramár:* ESSIR 2011, 8th European Summer School on Information Retrieval, Koblenz, Germany, August 28 – September 3, 2011
- *M. Kompan:* The Third International Conference on Software, Services & Semantic Technologies, Bourgas, Bulgaria, August 31 – September 4, 2011
- *M. Bieliková, P. Návrat:* Faculty of Information Technology, Brno University of Technology, Czech Republic, September 9, 2011
- *M. Bieliková, Z. Harsányi, P. Návrat:* ADBIS 2011, Advances in Databases and Information Systems, Vienna, Austria, September 20-23, 2011
- *Ľ. Molnár:* 187th session of the Executive Board, UNESCO, Paris, September 22-28, 2011
- *M. Bieliková, P. Návrat:* Faculty of Information Technology, Brno University of Technology, Czech Republic, October 14, 2011
- *M. Bieliková, M. Holub, P. Mederly, D. Zeleník:* Datakon 2011, Mikulov, Czech Republic, October15-18, 2011
- *M. Barla, M. Bieliková:* ACM SPY 2011, Prague, Czech Republic, October 21-22, 2011
- *Ľ. Molnár:* UNESCO, General Conference, Paris, France, October 23 – November 11, 2011
- *M. Bieliková:* WWW/Internet 2011, Rio de Janeiro, Brasil, November 3-12, 2011
- *P. Návrat:* GRIFO 2011, Mikulov, Czech Republic, November 7-8, 2011
- *P. Lacko:* SC11, International Conference for High Performance Computingm Networking, Storage and Analysis, Fairfax, USA, November 11-20, 2011
- *J. Tvarožek + 6 students:* ACM International Collegiate Programming Contest, Prague, November 11-14, 2011
- *M. Barla, M. Bieliková, P. Návrat, M. Šimko, J. Tvarožek, M. Tvarožek:* EU ICT STREP project meeting, Vienna, Austria, November 17, 2011

- *M. Bieliková, E. Kuric, J. Šimko:* SMAP 2011, 6th International Workshop on Semantic Media Adaptation and Personalization, Vigo, Spain, November 30 – December 3, 2011
- *J. Lang: Teacher's Thinking and Reasoning*, Velké Bílovice, Czech Republic, December 7-9, 2011
- *M. Barla, M. Šimko, J. Tvarožek, M. Tvarožek:* Circulate project meeting, Vienna, November 30, 2011

Visits to the institute

- Martin López Nores, University of Vigo, Spain, February 13-18, 2011

9.9 Membership in Professional Organisations and Societies

Slovak Professional Organisations and Societies

Michal Barla

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

Peter Bartalos

- Slovak Society for Computer Science (member, since 2007)
- Slovakia Chapter of the Association for Computing Machinery (member, since 2010)

Pavel Bartoš

- Slovak Society for Computer Science (member, since 1992)

Mária Bieliková

- Slovakia Chapter of the Association for Computing Machinery (member, since 2009)
- Slovak Artificial Intelligence Association (member, since 2000)
- Slovak Centre of the IET (member, since 1998)
- Slovak Society for Computer Science (member, since 1998; member of the executive committee, since 2000)

Daniela Chudá

- Slovakia Chapter of the Association for Computing Machinery (member, since 2009)

Matej Košík

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

Martin Labaj

- Slovakia Chapter of the Association for Computing Machinery (member, since 2011)

Peter Lacko

- Slovakia Chapter of the Association for Computing Machinery (member, since 2011)

Marián Lekavý
– Slovak Society for Computer Science (member, since 2007)

Pavol Mederly
– Slovak Society for Computer Science (member, since 1996)

Ľudovít Molnár
– Working Group of the Accreditation Commission of Slovakia for Information Sciences and Technologies (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
– Slovakia Chapter of the Association for Computing Machinery (member, since 2009)
– Working Group of the Accreditation Commission of Slovakia for Information Sciences and Technologies (member, since 1999)
– Informatics Working Group of the Accreditation Commission of Slovakia (member, since 1999, chair of the executive council since 2009)
– Slovak Artificial Intelligence Association (since 2000), member of the executive committee and vice chairman (since 2000)
– Slovak Association of Mathematicians and Physicists (member, since 1982)
– Slovak Centre of the IET (member, since 1996; chair, since 1997)
– Slovak Society for Computer Science (member, since 1992)

Karol Rástočný
– Slovakia Chapter of the Association for Computing Machinery (member, since 2011)

Ivan Polášek
– Gratex IT Institute (supervisory board member, since 2008)

Viera Rozinajová
– Slovakia Chapter of the Association for Computing Machinery (member, since 2009)

Ján Suchal
– Slovak Society for Computer Science (member, since 2007)

Marián Šimko
– Slovakia Chapter of the Association for Computing Machinery (member, since 2009)

Michal Tvarožek
– Slovakia Chapter of the Association for Computing Machinery (member, since 2009)
– Slovak Society for Computer Science (member, since 2007)

Peter Vojtek
– Slovak Society for Computer Science (member, since 2007)

Valentino Vranić
– Slovak Society for Computer Science (member, since 2001)

International Professional Organisations and Societies

Peter Bartalos
– ACM, Association for Computing Machinery (member, since 2010)
– IEEE Computer Society (member, since 2009)

Pavel Bartoš
– IEEE Computer Society (member, 2003–2005)

Mária Bieliková
– IEEE, Institute of Electrical and Electronic Engineers (member, since 1998; senior member since 2003)
– IEEE Computer Society (member, since 1997)
– IET, Institution of Engineering and Technology (member, since 1998)
– ECUK, Engineering Council UK (registered Chartered Engineer, since 1998)
– ACM, Association for Computing Machinery (member, since 1998; senior member since 2009)
– ACM SIGWEB, Special Interest Group on Hypertext the Web (member, since 2007)
– IFIP, International Federation for Data Processing (member of Technical Committee TC2 – Software: Theory and Practice, since 2008)
– ISWE, International Society for Web Engineering (member, since 2007)
– CaSTB, Czech and Slovak Testing Board, a member of ISTQB, International Software Testing Qualifications Board (member, since 2006)
– SOFSEM – Annual Conference on Current Trends in Theory and Practice of Informatics Series, standing Steering Committee (member, since 2002)
– Datakon – Annual Conference on the Current Trends in Databases and Information Systems Series, standing Steering Committee (member, since 2003)
– CEE-SET – Central and East European Conference on Software Engineering Techniques Series, standing Steering Committee (member, since 2007)
– SMAP – International Workshop on Semantic Media Adaptation and Personalization, standing Steering Committee (member since 2011)

Michal Holub
– ACM, Association for Computing Machinery (member, since 2010)

Daniela Chudá
– ACM, Association for Computing Machinery (member, since 2009)

Martin Labaj
– ACM, Association for Computing Machinery (member, since 2009)
– IEEE, Institute of Electrical and Electronic Engineers (member, since 2007)
– IEEE Computer Society (member, since 2007)

Peter Lacko
- IEEE, Institute of Electrical and Electronic Engineers (member, since 2008)
- IEEE Computer Intelligence Society (member, since 2008)
- ACM, Association for Computing Machinery (member, since 2010)
- ACM SIGHPC, Special Interest Group on High Performance Computing (member, since 2010)

Ľudovít Molnár
- IEEE, Institute of Electrical and Electronic Engineers (member, since 1991)
- ACM, Association for Computing Machinery (member, since 1991)
- UNESCO (Slovak Commission: member of bureau –1993-96, chair – since 1996, Informatics section – chair since1993. HQ Paris: IIP – member of bureau –1996-98, chair – 1998-2001, IFAP – member of bureau – since 2001. Executive Board – member – since 2001)
- ICETA, member of honorary committee

Pavol Návrat
- CEE Network, Central and Eastern European Network for Quality Assurance in Higher Education (chair, since 2006)
- AAAI, Association for the Advancement of Artificial Intelligence (member, since 1993)
- AACE, Association for Advancement of Computers in Education (member, since 1998)
- IEEE, Institute of Electrical and Electronic Engineers (member, since 1996; senior member, since 1998)
- IEEE Computer Society (member, since 1996)
- ACM, Association for Computing Machinery (member, since 1998; senior member since 2009)
- IFIP, International Federation for Data Processing (member of Technical Committee TC12 – Artificial Intelligence, since 1998)
- IET, Institution of Engineering and Technology (member, since 1998; fellow, since 1998)
- ECUK, Engineering Council UK (registered Chartered Engineer, since 1998)
- JCKBSE, Joint Conference on Knowledge-Based Software Engineering Series, standing Steering Committee (member, since 1998)
- ADBIS, Advances in Databases and Information Systems Conference Series, standing Steering Committee (member, since 1998)
- Znalosti Conference Series, standing Steering Committee (member, since 2006)

Karol Rástočný
- ACM, Association for Computing Machinery (member, since 2011)

Viera Rozinajová
- ACM, Association for Computing Machinery (member, since 2009)

Marián Šimko
- ACM, Association for Computing Machinery (member, since 2009)

Michal Tvarožek

– ACM, Association for Computing Machinery (member, since 2009)

Valentino Vranić

– IEEE, Institute of Electrical and Electronic Engineers (member, since 2011)
– IEEE Computer Society (member, since 2011)
– AOSD-Europe, European Network of Excellence on Aspect-Oriented Software Development (contact person at STU, since 2009)

9.10 Other Activities

– ACM International Collegiate Programming Contest 2011 – Slovak University of Technology Contest – A. Považanová: event organiser
http://www.fiit.stuba.sk/acm/

– ACM SPY 2011 – Czech ACM Chapter & Slovak ACM Chapter Student Project of the Year competition, M. Bieliková: chair of reviewers board, P. Návrat: member of reviewers board
http://www.acm-spy.sk, http://www.acm-spy.cz

– ACM SPY 2011 – 1st place in bachelor theses category (M. Barla: supervisor), 4th place in master theses category (M. Bieliková: supervisor) and 5th place in master theses category (M. Tvarožek: supervisor)

– Diploma thesis of the year 2011 – Czech and Slovak Competition – 2nd place (supervisor M. Barla)

– RoboCup at FIIT 2011, Soccer Simulation League, Regional Tournament in Bratislava – I. Kapustík and M. Lekavý: event organisers
http://www.fiit.stuba.sk/robocup/

– Imagine Cup 2011 – 3rd place in the World Finals, Game Design category, New York, USA (M. Tvarožek: supervisor)

– Imagine Cup 2011 – participation in the World Finals, New York, USA (M. Tvarožek: supervisor, M. Bieliková – judge for Software Design category)

– IIT.SRC 2011 – Informatics and Information Technologies Student Research Conference, May 4, 2011 – M. Bieliková: programme committee chair, M. Barla, D. Chudá, G. Kosková, P. Lacko, M. Lekavý, Ľ. Molnár, P. Návrat, I. Polášek, V. Rozinajová, V. Vranić, J. Tvarožek, M. Tvarožek: members of programme committee, http://www.fiit.stuba.sk/iit-src/

– IIT.SRC Invent 2011 – Design a Mobile Application, student competition, V. Vranić: committee chair, J. Šimko: 1st place

– IIT.SRC Invent 2011 – Design an Application for a Better World, student competition, M. Bieliková, M. Barla, M. Tvarožek: committee members, D. Zeleník, J. Šimko: 1st place

– TP Cup 2011 student competition – M. Bieliková: event organiser
http://www.fiit.stuba.sk/tp-cup/

– TP Cup 2011 student competition – 1st place (M. Barla: supervisor)

– ProFIIT 2011 – secondary school programming competition – I. Dekýšová: event organiser, http://www.fiit.stuba.sk/profiit

- FIITApixel – photography competition – J. Lang: competition director, `http://foto.fiit.stuba.sk`
- GraFIIT Foundation – book edition support – I. Polášek, P. Návrat: organisers
- Computing and Informatics (CAI) – P. Návrat: associate editor and member of the editorial board
- International Journal of Intelligent Information and Database Systems – M. Bieliková: member of the editorial board
- Journal of Web Engineering – M. Bieliková: member of the editorial board
- Information Sciences and Technologies Bulletin of the ACM Slovakia – P. Návrat: Editor-in-Chief, M. Bieliková: Associate Editor-in-Chief
- VEGA, Scientific Grant Agency of the Ministry of Education of Slovak Republic and the Slovak Academy of Sciences – M. Bieliková: member of technical committee
- Personalized Web (PeWe) Group seminar organization – M. Bieliková: group coordinator; `http://www.fiit.stuba.sk/research/pewe/`
- (Co)-organizing workshop WIKT 2011
- (Co)-organizing annual conference Znalosti 2011
- 7th International Conference "E-Learning and the Knowledge Society", August 25–26, 2011, Bucharest, Romania – D. Chudá: member of programme committee
- ACIIDS 2011 – 3rd Asian Conference on Intelligent Information and Database Systems, April 20-22, 2011, Daegu, Korea – M. Bieliková: member of programme committee
- ADBIS 2011 – 15th East-European Conference on Advances in Databases and Information Systems, September 19-23, 2011, Vienna, Austria – M. Bieliková: programme co-chair, P. Návrat: member of programme committee, member of steering committee, V.Rozinajová: member of programme committee
- ASEA 2011 – International Conference on Advanced Software Engineering & Its Applications, December 8-10, 2011, Jeju Island, Korea – M. Bieliková: member of programme committee
- CASoN 2011 – 3rd International Conference on Next Generation Web Services Practices, October 19-21, 2011, Salamanca, Spain – M. Bieliková: member of programme committee
- CEE-SET 2011 – 5th Central and East European Conference on Software Engineering Techniques, August 25-26, 2011, Debrecen, Hungary – M. Bieliková: member of programme committee, member of steering committee
- CompSysTech 2011 – International Conference on Computer Systems and Technologies 2011, June 16-17, 2011, Vienna, Austria – P. Návrat: member of programme committee
- CSSim 2011 – 2nd Interational Conference on Computer Modelling and Simulation, September 5-7, 2011, Brno, Czech Republic – M. Bieliková: member of programme committee
- Datakon 2011 – Annual Conference on the Current Trends in Databases and Information Systems, October 15-18, 2011, Mikulov, Czech Republic – M. Bieliková: member of steering committee, member of programme committee

- ECBS-EERC 2011 – 2nd Eastern European Regional Conference on the Engineering of Computer Based Systems, September 5–6, 2011 – V. Vranić: general chair and program co-chair, J. Lang, I. Polášek: members of programme committee

- EJC 2011 – 21st European Japanese Conference on Information Modelling and Knowledge Bases, June 6-10, 2011, Tallin, Estonia – M. Bieliková: member of programme committee

- ENASE 2011 – 6th International Working Conference of Evaluation on Novel Approaches to Software Engineering, June 8-11, 2011, Beijing, China – M. Bieliková: member of programme committee

- GCCP 2011 – 7th International Workshop on Grid Computing for Complex Problems, October 24-26, 2011, Bratislava, Slovakia – Ľ. Molnár: member of programme committee

- HT 2011 – 22nd ACM Conference on Hypertext and Hypermedia, June 6-9, 2011, Eindhoven, Netherlands – M. Bieliková: member of programme committee

- ICETA 2011 – 9th International Conference on Emerging E-Learning Technologies and Applications, October 27-28, 2011, Stará Lesná, High Tatras, Slovakia – P. Návrat, Ľ. Molnár: members of honorary committee, M. Bieliková: member of programme committee

- ICWE 2011 – International Conference on Web Engineering, June 20-24, 2011, Paphos, Cyprus – M. Bieliková: member of programme committee

- ISMIS 2011 – 19th International Symposium on Methodologies for Intelligent Systems, June 28-30, 2011, Warsaw, Poland – M. Bieliková: member of programme committee

- ITAT 2011 – Workshop on Information Technologies – Applications and Theory. September 23-27, 2011, Terchová, Slovakia – M. Bieliková, D. Chudá: members of programme committee

- KES AMSTA 2011 – 5th International KES Symposium on Agent and Multi-Agent Systems – Technologies and Applications, June 29-July 1, 2011, Manchester, UK – M. Bieliková: member of programme committee

- MCCIS-ISA 2011 – IADIS International Conference, Intelligent Systems and Agents 2011 Conference, July 24-26, 2011, Rome, Italy – M. Bieliková: member of programme committee

- MEMICS 2011 – Annual Doctoral Workshop on Mathematical and Engineering Methods in Computer Science, October 11-16, 2011, Mikulov, Czech Republic – M. Bieliková: member of programme committee

- NWESP 2011 – 7th International Conference on Next Generation Web Services Practices, October 19-21, 2011, Salamanca, Spain – M. Bieliková, V. Rozinajová: member of programme committee

- S3T 2011 – 3rd International Conference on Software Service Semantic Technologies, September 1–3, 2011, Bourgas, Bulgaria – M. Bieliková: member of programme committee

- SAMI 2011 – 9th International Symposium on Applied Machine Intelligence and Informatics, January 27-29, 2011, Herľany, Slovakia – Ľ. Molnár, M. Bieliková: members of programme committee

- SCLIT-2011 – Symposium on Computer Languages, Implementations, and Tools, September 19–25, Kassandra, Halkidiki, Greece – V. Vranić: member of programme committee

- SCO 2011 – Sharable Content Objects – E-learning Conference, June 22-23, 2011, Brno, Czech Republic – M. Bieliková: member of programme committee

- SERA 2011 – 9th International Conference on Software Engineering Research, Management and Applications, August 10-12, 2011, Towson University, USA – M. Bieliková: member of programme committee

- SMAP 2011 – 6th International Workshop on Semantic Media Adaptation and Personalization, December 1-2, 2011, Vigo, Spain – M. Bieliková: member of programme committee, member of steering committee

- SNAA 2011 – 1st Workshop on Social Network Analysis and Applications at Int. Conf. on Advances in Social Networks and Mining (ASONAM 2011), July 25-27, 2011, Kaohsiung, Taiwan – M. Bieliková: member of programme committee

- SNPD 2011 – 12th International Conference on Software Engineering, Artificial Intelligence, Networking and Parallel/Dustrubuted Computing, July 6-8, 2011, Sydney, Australia – M. Bieliková: member of programme committee

- SOFSEM 2011 – 37th International Conference on Current Trends in Theory and Practice of Informatics, January 22-28, 2011, Nový Smokovec, Slovakia – M. Bieliková: chair of Student Research Forum

- UMAP 2011 – 19th International Conference on User Modelling, Adaptation and Personalization, July 11-15, 2011, Girona, Spain,– M. Bieliková: member of programme committee

- VaMoS 2011 – 5th International Workshop on Variability Modelling of Software-intensive Systems, January 27–29, 2011, Namur, Belgium – V. Vranić: member of programme committee

- WEBIST 2011 – 7th International Conference on Web Information Systems and Technologies, May 6-9, 2011, Noordwijkerhout, The Netherlands – M. Bieliková: member of programme committee

- WIKT 2011 – 6th Workshop on Intelligent and Knowledge oriented Technologies, November 24-25, 2011, Herľany, Slovakia – M. Bieliková, P. Návrat, V. Rozinajová: members of programme committee

- WIRSS 2011 – 4th International Workshop on Web Information Retrieval Support Systems, 2011 IEEE/WIC/ACM International Conference on Web Intelligence, August 22–27, 2011, Lyon, France – P. Návrat: member of programme committee

- Znalosti 2011 – Annual Conference on Knowledge and Intelligent Systems, January 31 - February 2, 2011, Stará Lesná, Slovakia – M. Bieliková, P. Návrat, D. Chudá, V. Rozinajová: members of programme committee, P. Návrat: member of steering committee

10 Regional Networking Academy

E-mail: info@cisco.fiit.stuba.sk
Web: www.cisco.fiit.stuba.sk
Tel: + 421 2 602 91 689
Fax: + 421 2 654 20 587

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

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

RCNA FIIT STU offers technological environment for research in the field of modern methods of communication in the computer networks. It creates quality conditions for solving research grants in the field of methods and resources for creating security and management of communication and mobile computer systems. Pedagogical process is greatly enhanced by providing the necessary support for practical learning during the education of subjects related to computer networking throughout all three degrees of study program Computer systems. Within the education process of RCNA prepares instructor training of 24 Local Cisco Networking Academies in the Slovakia and prepares students for CCNA and CCNP certification exams.

10.1 Staff

Director
Pavel Čičák, Associate Professor, CCNA, CCAI

Administrative Department
Marušincová Zuzana

Instructor Staff
Boris Dado
Igor Grellneth, PhD., CCNA, CCNP, CCAI
Katarína Jelemenská, PhD.
Margaréta Kotočová, Associate Professor, CCNA, CCAI
Peter Mesjar, CCNA, CCNP, CCAI, CCIE
Peter Vilhan
Filip Burda, CCNA, CCNP
Peter Havrila, CCNA, CCNP
Adrián Chovan, CCNA, CCNP

Engineering Staff
Dušan Bernát
Roman Stovíček, PhD.

10.2 Projects

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

10.3 Study programmes

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

10.4   Cooperation

Cooperation in Slovakia

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

International Cooperation

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

11   FIIT Personnel

ABAFFY, Jaroslav, Ing.	Institute of Computer Systems and Networks
ANDREJČÍKOVÁ, Nadežda, Ing. PhD.	Institute of Informatics and Software Engineering
BALÁŽ, MARCEL, Ing. PhD.	Institute of Computer Systems and Networks
BALAŽIA, Ján, Ing.	Institute of Computer Systems and Networks
BARLA, Michal, Ing. PhD.	Institute of Informatics and Software Engineering
BARTALOS, Peter, Ing. PhD.	Institute of Informatics and Software Engineering
BARTOŠ, Pavol, Ing.	Institute of Informatics and Software Engineering
BÁTORYOVÁ, Magda	Registry
BELAJOVÁ, Lenka	Deanship – Study Affairs
BENEŠOVÁ, Vanda, Ing. PhD.	Institute of Applied Informatics
BERNÁT, Dušan, Ing.	Institute of Computer Systems and Networks
BIELEKOVÁ, Alexandra, Ing.	Head of Administrative Department
BIELIKOVÁ, Mária, prof. Ing. PhD.	Institute of Informatics and Software Engineering
BORŽENSKÝ, Ladislav, Ing.	Institute of Informatics and Software Engineering
BOU EZZEDDINE, Anna, RNDr. PhD.	Institute of Informatics and Software Engineering
BUDINSKÁ, IVANA, Ing. PhD.	Institute of Informatics and Software Engineering
BRATH, Peter	Centre of Computing and Communication Services
BREIER, Jakub, Ing.	Institute of Applied Informatics
BREZNENOVÁ, Soňa	Deanship – Personal Resources
BRUSILOVSKY, Peter, visiting prof.	Institute of Informatics and Software Engineering
ČAPLA, Robert, Ing.	Institute of Informatics and Software Engineering
CLEMENTIS, Ladislav, Ing.	Institute of Applied Informatics
ČERŇANSKÝ, Michal, doc.Ing. PhD.	Institute of Applied Informatics
ČIČÁK, Pavel, doc. Ing. PhD.	Institute of Computer Systems and Networks
DADO, Boris, Ing.	Institute of Computer Systems and Networks
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DEKÝŠOVÁ, Iveta, JUDr.	Institute of Informatics and Software Engineering
DRAHOŠ, Peter, Ing. PhD.	Institute of Applied Informatics
DRGONEC, Vladimír, Ing.	Centre of Computing and Communication Services
FALBOVÁ, Lucia, Mgr.	Centre of Information and Library Services
FLOCHOVÁ, Jana, Ing. PhD.	Institute of Computer Systems and Networks

Folgelton, Andrej, Ing.	Institute of Applied Informatics
Forus, Samo, Bc.	Centre of Computing and Communication Services
Frič, Pavol, Ing. PhD.	Institute of Informatics and Software Engineering
Galanová, Jana, doc. RNDr. PhD.	Institute of Informatics and Software Engineering
Galbavý, Miroslav, Ing.	Institute of Applied Informatics
Genči, Ján, doc. Ing. PhD.	Institute of Informatics and Software Engineering
Gnipová, Marta, RNDr.	Centre of Computing and Communication Services
Gramatová, Elena, doc. RNDr. PhD.	Institute of Computer Systems and Networks
Grell, Peter	Centre of Computing and Communication Services
Grellneth, Igor, Ing. PhD.	Institute of Computer Systems and Networks
Habajová, Eva	Deanship – Economics
Hrušková, Nikoleta, Mgr.	Institute of Informatics and Software Engineering
Harsányi, Zoltán, Ing.	Institute of Informatics and Software Engineering
Holub, Michal, Ing.	Institute of Informatics and Software Engineering
Horváth, Pavol, prof. Ing. PhD.	Institute of Computer Systems and Networks
Hricová, Mária	Deanship – Research
Hrubý, Martin, Ing.	Institute of Computer Systems and Networks
Hudec, Ján, Ing.	Institute of Computer Systems and Networks
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Husková, Ľubica	Deanship – Study Affairs
Chudá, Daniela, doc. Mgr. PhD.	Institute of Informatics and Software Engineering
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Kapec, Peter, Ing.	Institute of Applied Informatics
Kapustík, Ivan, Ing.	Institute of Informatics and Software Engineering
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MACKOVÁ, Zuzana	Institute – Secretariat
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MALIŠ, Roman	Centre of Computing and Communication Services
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ORŠULA, Viliam	Centre of Computing and Communication Services
ORLOVSKÝ, František	Department of Tech. Operation and Management
PALATINUSOVÁ, Ľubica, Ing.	Faculty Secretary
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POSPÍCHAL, Jiří, prof. RNDr. DrSc.	Institute of Applied Informatics
POVAŽANOVÁ, Anna, Ing.	Institute of Informatics and Software Engineering
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