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TSP-Telecommunications and Signal Processing Italian-Czech Matchmaking event

July 3, 2013

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CATALOG OF CZECH PROFILES



2013 36th International Conference on Telecommunications and
Signal Processing (TSP)
Rome, July 2-4, 2013
<http://tsp.vutbr.cz/>



Academy of Sciences of Czech Republic
Technology Centre
Janosec Jiri TC, janosec@tc.cz



National Research Council of Italy

Consiglio Nazionale delle Ricerche
Dipartimento Scienze Umane e Sociali,
Patrimonio Culturale
Irene Dell'Aversana,
irene.dellaversana@itabc.cnr.it
Vania Virgili, vania.virgili@cnr.it

Brno University of Technology

Department of Radio Electronics, SIX Research Centre – Lab of Analog and Digital Systems

Description of Activities:

Scope of the research team:

- computer-aided simulation, analysis, measurement and design of analog and mixed electronic systems,
- implementation of algorithms for fast digital signal processing in communication systems (FPGA),
- questions of signal integrity in high-speed mixed electronic circuits (analysis of circuits with distributed parameters),
- questions of identifying and analyzing complex/intricate parasitic phenomena (chaos in particular) in nonlinear dynamical systems such as oscillators, modulators, mixers, or filters,
- solving problems of the implementation of systems in microprocessor platforms with a view to reliability and efficiency testing.

Research team's members participated withing the project Advanced Communication Systems and Technologies (ACOST) of the 7th Framework Programme (led by prof. Zdenek Kolka).

Cooperation profile:

We are interested in:

- joint research,
- future projects partners,
- staff exchange.

Name of the Participating Person:
Lubomir Brancik

Contact address: **Technicka 12, 616 00
Brno, Czech Republic**

Web page:

<http://www.urel.feec.vutbr.cz/>,
<http://www.six.feec.vutbr.cz/>

Brno University of Technology

Dept. of Telecommunications

Description of Activities:

We do a research in the field of Medical image processing, especially MRI image processing. We have experience with image processing, MRI image processing and machine learning algorithms. Currently we focus on multi-parametric MR image segmentation and brain tumour detection and segmentation for further tumour type classification.

Cooperation profile:

We are looking for joint research partner in the field of Medical image processing, especially automatic MR image processing and analysing and implementing statistical, machine learning and computer vision algorithms into this field and combine them with human learning and decision making.

Name of the Participating Person: **Pavel Dvořák**

Contact address: **Technicka 12, 616 00
Brno, Czech Republic**

Web page:

<http://www.urel.feec.vutbr.cz/>,
<http://www.six.feec.vutbr.cz/>

Brno University of Technology

Department of Telecommunications

Description of Activities:

Computer security, cryptography, ciphers, authentication systems, privacy, digital identity protection, lightweight cryptography, theoretical cryptography, smart-cards, low-performance devices and implementation of algorithms on resource-restricted devices, Android, iOS development, stress-testing, infrastructure benchmarking.

Past international cooperation

USA: cooperation with the University of Minnesota, USA on the cryptographic protocol design. Cooperation with NIST, USA on the privacy-enhancing cryptography for attribute-based, user-centric authentication (project NSTIC).

EU: cooperation with the ABC4Trust consortium (IBM, Nokia, Microsoft, Uni Frankfurt, etc.) on the research and implementation of privacy-enhancing cryptographic protocols. Cooperation with the Universitat Rovira i Virgili, Spain on advanced cryptographic systems for Inter-Vehicular Networks (VANETs).

Experience

32 scientific publications on cryptology and computer security, 8 research projects on cryptology and security, 2 courses on security taught, member of Security technologies laboratory.

Cooperation profile:

Looking for anyone dealing with advanced cryptology, privacy and digital identity protection and computer (infrastructure) security. Expected collaboration: joint project, or see <http://crypto.utko.feec.vutbr.cz> for services available.

Name of the Participating Person: **Jan Hajny**

Contact address: **Technická 12, 616 00 Brno, Czech Republic**

Web page:
<http://crypto.utko.feec.vutbr.cz>

Brno University of Technology

Department of Telecommunications, SIX Research Center –
Converged Systems

Description of Activities:

The “Specialized instruments, devices and electronic circuits” group of Converged Systems, SIX Research Center, is specialized for development of unique electronic measurement instruments, development of devices for medicine, transfer of data from medical devices, and data processing.

Cooperation profile:

Thanks to our experience we can offer the exclusive technological background for the development and manufacture of devices offered to commercial subjects such as:

- i)Optical, X-ray and infrared analyses of printed circuit boards with mounted devices and of larger functional blocks. Detection of all common defects using manual, semiautomatic and fully automatic methods of processing object images,
- ii)Visualization of radiated electromagnetic and thermal fields of electronic circuits on printed boards – intensity and position measurement of the source of radiation, which is suitable for ensuring electromagnetic compatibility (EMC) and
- iii)Testing of temperature and (common or even extreme) climatic effects on products, using the climatic chamber,
- iv) Joint collaboration on projects, ISI journal publications, patent applications related to analog IC design and development.

Name of the Participating Person: **Norbert Herencsar**

Contact address: **Technická 12, 616 00 Brno, Czech Republic**

Web page:
<http://www.six.feec.vutbr.cz/programs/converged-systems/>,
<http://www.utko.feec.vutbr.cz/~herencsar/>

Brno University of Technology

Department of Telecommunications

Description of Activities:

I am working as a postdoc researcher at the Department of Telecommunications, Brno University of technology. My research areas cover several issues in wired and wireless networks, such as Quality of Service (QoS) support, routing in Mobile Adhoc Networks (MANET), network management and analysis, simulation of network technologies and protocols (OPNET Modeler, NS-3, Matlab), Quality of Experience (QoE) evaluation in cellular networks. I am also head of IP-based wireless networks team within the WISLAB research group (<http://wislab.cz>). I was participating in several national research projects supported by Czech Science Foundation or Czech Ministry of Education, Youth and Sports or industry projects (e.g. granted by T-Mobile Czech Republic).

I can offer team of highly motivated junior and senior researchers with strong experiences in area of mobile networks, QoS support, QoE evaluation, Machine-to-Machine (M2M) communications, mobility modelling in wireless networks and design of web applications. We can also provide modern technical research background including unique IP-based network devices for the design and evaluation of various wired or wireless technologies, protocols, security issues, application performance, etc.

Cooperation profile:

I am looking for the research or industry partners in order to establish international joint research team aiming the cooperation in above mentioned areas. I am looking for the partner with experiences of coordination of European projects and strong know-how in applied research. The possible partner should have knowledge and experience in area of mobile wireless networks, M2M communication and social-based data forwarding / offloading.

Name of the Participating Person: **Jiri Hosek**

Contact address: **Technicka 12, 616 00 Brno, Czech Republic**

Web page: www.utko.feec.vutbr.cz/en

Brno University of Technology

Department of Telecommunications

Description of Activities:

Lukas Malina is employed at the Department of Telecommunications as a research assistant and he is also involved in teaching of Cryptography. During the study period of his PhD he visited Universitat Rovira i Virgili, Tarragona, Spain for half-year PhD exchange stay with focus on Vehicular Ad-Hoc Network Security. Lukas Malina deals with privacy preserving cryptographic protocols and authentication schemes. In this field, he designs and applies new group signature schemes with special features e.g. batch verification, DDoS mitigation, time-bounded revocation etc. Further, he designs and develops lightweight cryptographic protocols for computationally restricted devices and implements privacy preserving systems on smart-cards and smartphones with the Android platform. He has been involved in several Czech national research projects such as Application of modern cryptographical methods to increase communication security in telematics systems (Industrial partner: Honeywell), Cryptographic system for the protection of electronic identity (Industrial partner: OKsystem), Integration server with cryptographic protection (Industrial partner: TTC Telekomunikace), Intelligent telematics information system for public transportation (Industrial partner: Herman) etc.

Cooperation profile:

We are looking for partners who are groups of people with interest in and passion for cryptography, computer security and applied mathematics. We would like to found new partners for the joint research and development in modern privacy preserving and lightweight cryptography. We would like to join a consortium established in European projects (e.g. Horizon 2020) dealing with applied cryptography and security.

Name of the Participating Person: **Lukas Malina**

Contact address: **Technicka 12, 616 00 Brno, Czech Republic**

Web page: <http://crypto.utko.feec.vutbr.cz/>

Brno University of Technology

Department of Radio Electronics

Description of Activities:

My name is Ladislav Polák. I was born in Štúrovo, Slovakia in 1984. I am received the M.Sc. degree in Electronics and Communications 2009 in from the Brno University of Technology. I am currently a Ph.D. student at the Department of Radio Electronics, Brno University of Technology and my topic is Analysis and Simulation of the Signal Transmission in the DVB-H/SH Standards. My research interests are the Digital Video Broadcasting (DVB) and Digital Audio Broadcasting (DAB) systems, theory of digital television and audio, measurements in digital television and audio broadcasting, communication systems, mobile systems and multimedia transmission, including video image quality evaluation. I have been an IEEE member since 2010.

The team at Department of Radio Electronics that I am working with has actively participated within the COST Action IC1003: European Network on Quality of Experience in Multimedia Systems and Services (QUALINET), <http://www.qualinet.eu/>. Our topics in the project are related to the subjective and objective video image quality metrics development and evaluation. In the frame of the IC1003 COST Action we cooperate mainly with FEE CTU in Prague and also with other European research institutions, namely Klagenfurt (AAU), Wien (FTW), Brussel (Vrije Universiteit), VTT Technical Research Centre of Finland, Université de Nantes/Polytech Nantes, TU Berlin, Fondazione Ugo Bordoni, NTNU, and EPFL. We have also received national grant for the European cooperation within the QUALINET project – LD12005, Quality of Experience aspects of broadcast and broadband multimedia services (QUALEXAM), for the period 2012-2014.

The other cooperation of the Department of Radio Electronics, Brno University of Technology is/was of the form of European framework program projects (FP7-TRANSPORT HIRF 2008-2013, FP7-REGPOT ACOST 2009-2012) and European Cooperation in Science

Name of the Participating Person:

Ladislav Polak

Contact address: **Technická 12, 616 00 Brno, Czech Republic**

Web page: www.urel.feec.vutbr.cz

E-mail: brancik@feec.vutbr.cz

and Technology actions (COST IC0803 RFCSET, IC0603 ASSIST, IC 0906 WiNeMo etc.) and European project ENIAC JU ARTEMOS (2011-2014) where I have part time worked on RF subsystems co-existence (mainly between DVB and LTE standards) tasks.

Cooperation profile:

Department of Radio Electronics, Brno University of Technology, is a part of Sensor, Information and Communication Systems (SIX) Research Center, where I am currently a technical assistant. SIX research center is focused on the research of communication systems and their components to be operated in emerging frequency bands. As a part of department and center SIX, there are modern laboratories of digital TV and radio systems and mobile communications.

The laboratory of digital TV and radio systems is concerned with the measurement and analysis of digital TV transmissions in first-generation and second-generation DVB standards, standards for mobile wireless television networks, and, most recently, also in standards for DAB and DMB digital radio broadcasting. The results of the laboratory consist in analyses of the application of hitherto unused hierarchical modulation in terrestrial transmission of digital television DVB-T/H, interactivity in networks for mobile television DVB-H, evaluation of image quality in HDTV transmissions, and applications leading to the convergence of digital television and radio broadcasting. In addition to a number of commercial measurements related to the verification of the functionality of the receivers and transmitter networks developed for DVB-T and DVB-H television the laboratory developed an original methodology for testing the tuners of DVB-T receivers in automotive technology.

The laboratory of mobile communications is mainly oriented towards analyzing, measuring and optimizing the parameters of physical layers of wireless communication standards (e.g. GSM, UMTS, HSPA and LTE). The work is based on creating models of physical layers, their subsequent optimization, and verification of optimized models via measuring by available instrumentation, and comparison of the results. The laboratory is also engaged in modeling and measuring the co-existence of wireless standards on the physical interface. The current instruments provide for working up to 3 GHz.

Quite good instrumentation is available for experimental work in mentioned laboratories. These laboratories contain excellent

measurement equipment from Rohde & Schwarz, which enable measuring and monitoring the performance of modern communication technologies. There are SFU broadcast test system and ETL TV analyzer, which enable to generate TV and radio broadcast signals (in a frequency range from 100 kHz to 3GHz) and analysis it (parameters on the physical layer and detailed information about the MPEG transport stream), respectively. Furthermore, there are SMU vector signal generator (it can be fitted with wide range of options for all advanced digital standards such as HSPA(+) and LTE (FDD and TDD)) and software application ROMES4 (installed on PC for the monitoring and evaluation of the parameters of mobile network), respectively.

Brno University of Technology

Department of Microelectronics

Description of Activities:

Analog, digital and mixed-mode integrated circuit design, intelligent sensor signal processing (electrochemical, vibration, conductivity etc. sensors). Modern analog circuit blocks (CDTA, CCTA, conveyors), low-voltage circuits, digital IC circuit synthesis, A-D converters, auto-tuneable and auto-compensation analog circuits.

Experience with AMIS I2T & I3T technologies, Cadence.

Realization of prototypes by EURO PRACTICE Project plan.

European projects:

Eniac-E3car: Nanoelectronics for an Energy Efficient Electrical Car.

Cooperation profile:

We offer cooperation in joint development and project partnership.

Name of the Participating Person: **Roman Prokop**

Contact address: **Technická 3058/10,
616 00 BRNO, Czech Republic**

Web page:

<http://www.umel.feec.vutbr.cz/>

Brno University of Technology

Department of Telecommunications

Description of Activities:

Kamil RIHA received his M.Sc. degree in Electronics & Communication in 2003 and the Ph.D. degree in 3D Scene Acquisition for Auto-Stereoscopic Display in 2007. Presently, he is employed by the Brno University of Technology, Faculty of Electrical Engineering, Department of Telecommunications, as the academic employee (since 2006). His research interests include in particular areas of digital image and video processing. He is the guarantor of the course Advanced techniques of image processing.

Field of interest:

Image and video sequence processing;
Processing of medical dynamic ultrasound video sequences;
Optical flow analysis in video sequences;
Object detection and tracking in the scene;
3D scene acquisition and 3D image reproduction.

Projects:

2010-2014: Improvement of risk area security using combined methods for biometrical identification of subjects. Project MVO/VG20102014033;
2011-2014: Intelligent Videomodules for Entry Control Systems to Critical Infrastructure Facilities. Project MPO/FR-TI3/170;
2010–2013: Centre of sensor, information and communication systems. Project MSM/ED2.1.00/03.0072;
2010-2012: The Research of Algorithms for Processing of Digital Images and Image Sequences. Project MSM/ME10123;
2006–2011: New Diagnostic Methods of Circulatory System Parameters Recognition Based on Infra-Red Scanning of Blood-Vessels Image. Project MSM/2B06111;
2006-2009: Research and development of multifunction bi-directional communication technology for warning the public. MPO/FT-TA3/001.

Name of the Participating Person: **Kamil Riha**
Contact address: **Technická 12, CZ - 616 00 Brno**
Web page: <http://splab.cz/en>

Cooperation profile:

R&D contracts, joint research, joint R&D projects etc.

Brno University of Technology, WISLAB laboratory

Department of Telecommunications

Description of Activities:

We offer deep experience in the wireless solutions for the intelligent homes and smart cities. Particularly we provide green solutions based on the low power sensor networks that can be used in the novel smart and cloud applications. Our team was involved in the preparing of two FP7 projects, one dealing with the localization and tracking of fast moved trains and second was focused on the research of the Intelligent system for smart water management. In both project, we act as the leader of specific workpackages. The contact person Milan Simek also works as the FP7 ICT projects evaluator and thus can offer valuable experiences for the project preparation. More information about our experiences can be found at www.wislab.cz

Cooperation profile:

We are looking for the partner that provide space and own property for installation of the large wireless sensor networks in order to test the WSN solution in large scale. Furthermore, we would like to get the new ideas about the application of the smart WSN systems mainly in the field of the smart cities and home and building automation.

Name of the Participating Person: **Milan Simek**

Contact address: **Technicka 12, 616 00 Brno, Czech Republic**

Web page: www.wislab.cz

Brno University of Technology

Department of Telecommunications

Description of Activities:

I am an associate professor, specialization on Electronics and Communication at the Department of Telecommunications, Brno University of Technology, Czech Republic and a senior researcher of SIX Centre (Sensor, Information and Communication Systems), a head of Laboratory of Transmission Networks. I am also a chief of a team of researchers, post-doctoral students and students. My main professional activities are computer modelling of modern converged communication networks, design of network elements, optimization, Quality of Service, application of artificial neural networks, evolutionary algorithms and of Field-Programmable Gate Array (FPGA). My research interest represents design of new advanced algorithms and controlling protocols for perspective converged informatics and communications systems, formulation of software mathematical models and their simulation and optimization, solution in a different working conditions, hardware network elements development and the like.

The workplace in my laboratory of transport networks are predominantly determined for network elements development of 10 GB Ethernet (10GBase-LR) and for development of switching algorithms which are controlled by neural network on the layers L2 and L3 RM OSI. Filtration algorithms are developed for 10GBase-LR using.

The research is supported by network elements analysis – their throughput, data transmission efficiency in different situations etc. The development of own tests with coverage of element's efficiency on the layers L2-L7 is realized. The analysis is operated in the frame of own research and it is offered also as a service for other laboratories and for commercial subjects. The CD/PMD analysis is important.

The research innovation is based on the fact that classical rules for a quality of service QoS are not sufficient. The QoS rules have been possible to implement in the networks, where for approx. 20% of the traffic can be reflected. The original algorithms are hardly usable

Name of the Participating Person: **SKOPRIL Vladislav**

Contact address: **Technicka 12, 616 00 Brno, Czech Republic**

Web page: <http://www.utko.feec.vutbr.cz/~skorpil>

in the current networks, because a multimedia content – video, creates as far as 80% of the traffic.

My interest is focused also to multimedia services. The research trends to QoS rules pre-setting for “network bottlenecks” e.g. microwave connections. The aim is a combination between QoS and a compression – it is possible to compress less important flows. It is necessary to differentiate at the same time, if it is a duplex flow (videoconference with audio) or a simplex flow without delay forcing.

Cooperation profile:

I am looking for a wide spectrum of partners - joint research, national project partner and also European project partner, coordinator, partner for staff exchange, etc. I expect a research on the same or similar research areas as I and an interest to co-operate. I accept various types of collaboration, from research project, joint development to staff exchange, etc. I have no special request of references.

VŠB-Technical University of Ostrava

Department of Telecommunications

Description of Activities:

We are engaged in Free Space Optics, outdoor and indoor. We study the influences of atmosphere on communication. For this purpose we have a chamber in which we create atmospherical conditions. We deal with indoor optical communication too. We construct an optical transmitter for indoor, we tested a modulation. We have built a dark room in which are done experiments.

Cooperation profile:

We are looking for some partners which deal with the same and are able to share the experiences.

Name of the Participating Person: **Jan Vitásek**

Contact address: **17. listopadu 15, 708 33 Ostrava**

Web page: <http://kat440.vsb.cz/>

Technical University of Ostrava

Department of Telecommunications, Faculty of Electrical Engineering and Computer Science

Description of Activities:

I offer cooperation (from position of Department chair) in field of Information and Communication Technologies (focusing especially on Multimedia and Cybersecurity), nevertheless generally in ICT.

http://homel.vsb.cz/~voz29/images/CV_Voznak_EN.pdf

<http://homel.vsb.cz/~voz29/publikace.html>

Since 2009, member of INDECT team, Intelligent information system supporting observation, searching and detection for security of citizens in urban environment. The 7FP EU (2009-2014) under Grant Agreement No. 218086, conducted by AGH Cracow (Poland).

Since 2011, researcher in Softcomputing team involved in IT4Innovations, Czech National Centre of Excellence, Ostrava (CZ),

<http://www.it4i.cz/en/index.php>

Cooperation profile:

We are looking for partners or coordinator willing to cooperate with us in ICT and submit a research project in 7 FP EU or Horizon 2020.

We are able to cooperate not only with universities in EU and R&D institutions, but we are ready to solve practical issues in ICT with industry and interested in applied research as well

We are not looking for a sources for travelling (our aim is 7FP EU or Horizon 2020).

Name of the Participating Person
Miroslav VOZNAK

Contact address: **Technical University of Ostrava, 17. listopadu 15, 708 33 Ostrava, CZ**

Web page: <http://www.vsb.cz/en/>

