

**DEPARTMENT OF TELECOMMUNICATIONS**

<http://www.ktl.elf.stuba.sk>

**Head of Department**

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**I. STAFF**

Professors	Prof. Ing. Peter Farkaš, DrSc., Prof. JUDr. Mária Patakyová, PhD., Prof. Ing. Pavol Podhradský, PhD.
Associate Professors	Doc. RNDr. Ing. Ivan Bajla, PhD., Doc. Ing. Ivan Baroňák, PhD, Doc. Ing. Ján Čuchran, PhD., Doc. Ing. Jana Kotuliaková, PhD, Doc. Ing. Miloš Oravec, PhD., Doc. Ing. Jarmila Pavlovičová, PhD., Doc. Ing. Jaroslav Polec, PhD., Doc. Ing. Gregor Rozinaj, PhD., Doc. Ing. Ján Zodl, PhD.
Assistant Professors	Ing. Jozef Čepko, Ing. Jana Filanová, PhD., Ing. Michal Halás, PhD., Ing. Ján Hodál, Ing. Erik Chromý, Ing. Tomáš Janvars, Ing. Juraj Kačur, PhD., Ing. Juraj Mačica, Ing. Martin Medvecký, PhD., Ing. Kvetoslava Kotuliaková, PhD., Ing. Jozef Oboňa, Ing. Miloš Orgoň, CSc., Ing. Michal Poľaško, PhD., Ing. Martin Rakús, PhD., Ing. Rastislav Róka, PhD., Ing. Eva Samuhelová, Ing. Peter Trúchly, PhD., Ing. Radoslav Vargic, PhD.
Research Workers	Ing. Štefan Jurko, PhD., Ing. Matej Kavacký, PhD., Ing. Ivan Kotuliak, PhD., Ing. Miroslav Talanda
Technical Staff	Alexandra Šafariková, Iveta Kováčiková (secretary), Mária Barbiriková, Michaela Bujková, Ing. Rozália Hudíková, Ing. Maroš Michalík
PhD. Students	Ing. Peter Bandzi, Ing. Marián Beszédeš, Ing. Anton Březina, PhD., Ing. Bakyt Kyrbashov, Ing. Peter Kvačkaj, PhD., Ing. Juraj Mačica, Ing. Martin Mojžeš, Ing. Andrej Páleník, Ing. Tomáš Páleník, Ing. Matúš Turcsány, Ing. Martin Turi Nagy, Ing. Ján Vrabc, Ing. Juraj Vojtko

**II. EQUIPMENT**

**II.1 Teaching and Research Laboratories**

- E-learning Multimedia Laboratory
- Laboratory of Data Transmission
- Laboratory of Optical Communications Systems
- Laboratory of Digital Image Processing
- Laboratory of Digital Signal Processing
- Laboratory of Digital Speech Processing
- Laboratory of Digital Switching Systems and ISDN
- Laboratory of Intelligent Networks and Services
- Laboratory of Multimedia Communication
- Laboratory of Telecommunications Management Network
- Laboratory of Telecommunications Technology (Optical SDH, ATM, RWS)
- NGN Lab

**II.2 Special Measuring Instruments and Computers**

- Optical Network (SDH – STM, 155 Mbit/s)
- Optical Network (ATM – 155 Mbit/s)
- Multiplexor NORTEL S/DMS 1X (16 x 2,048 Mbit/s)
- Private Telecommunication System ALCATEL A4300L
- Private ISDN Network
- Micro Radio Wave System TeleStar 23 CL (4 x 2, 048 Mbit/s)
- FWA system (27 GHz) - VoIP via SANET
- FWA system (3,5 GHz) - VoIP and High Speed Internet via SANET
- Laboratory NGN PABX OXE Communication Server (Connection among STU Bratislava, ŽU Žilina, TU Košice)
- Telecommunications Videoconference Systems for ISDN (3 x PictureTel, 2 x I VIEW)
- Measuring set Wandel and Goltermann IBT 10 (for ISDN interface S0 and U)
- Siemens Node Integrator – Software for Simulation of TMN
- COSSAP (Software for simulation of telecommunication systems)
- Measuring set Siemens - Carrier Frequency Level Test (Set W2008-K/D2008-K)
- Logic Analyzer Philips PM 3570
- Cluster composed of 6 PC, aggregate 10,6 GHz
- FWA system VoIP via SANET
- Telecommunications Instructional Teaching Modelling System TIMS-301

### **III. TEACHING**

#### **III.1 Undergraduate Study (Bc.)**

Subject, semester, hours per week for lectures and for seminars or practical exercises, name of lecturer

Telecommunication Technologies	(3rd sem., 3-2h)	I.Barošák, J.Čuchran
Digital Communications	(4th sem., 3-2h)	P.Farkaš
Telecommunication Technologies	(4th sem., 3-2h)	I.Barošák, J.Čuchran
Analog and Digital Signal Processing I.	(5th sem., 3-2h)	P.Podhradský
Probabilistic Models in Telecommunications	(5th sem., 3-2h)	J.Polec
Telecommunications Lines	(5th sem., 3-2h)	J.Čuchran, R.Róka
Digital Signal Processing	(6th sem., 3-2h)	J.Kotuliaková
Electronics in Commun. Systems	(6th sem., 3-2h)	P.Podhradský
Mobile and Satellite Communications I.	(6th sem., 3-2h)	P.Farkaš
Telecommunications Lines	(6th sem., 3-2h)	J.Čuchran
Communication Protocols	(7th sem., 3-2h)	M.Poľaško
Switching Systems I.	(7th sem., 3-2h)	I.Barošák
Transmission Systems	(7th sem., 3-2h)	J.Čuchran, R.Róka
Integrated Services of Digital Networks	(8th sem., 3-2h)	M.Oravec
Network Architectures	(8th sem., 3-2h)	M.Poľaško
Switching Systems II.	(8th sem., 3-2h)	I.Barošák
Selected Methods for Image Compression	(8th sem., 3-2h)	J.Polec

#### **III.2 Graduate Study (Ing.)**

Mobile and Satellite Communications II.	(1st sem., 3-2h)	P.Farkaš
Probabilistic Models in Telecommunications	(1st sem., 3-2h)	J.Polec
Selected Methods for Image Compression	(1st sem., 3-2h)	J.Polec
Switching Systems II.	(1st sem., 3-2h)	I.Baroňák
Electronics in Commun. Systems	(2nd sem., 3-2h)	P.Podhradský
Broadband Switching Systems	(3rd sem., 3-2h)	M.Medvecký
Digital Image Processing	(3rd sem., 3-2h)	J.Pavlovičová
Digital Speech Processing	(3rd sem., 3-2h)	G.Rozinaj
Intelligent Networks and Services	(3rd sem., 3-2h)	P.Podhradský
Neural Networks for Signal Processing	(3rd sem., 3-2h)	M.Oravec
Optical Communication Systems and Networks	(3rd sem., 3-2h)	J.Čuchran, R.Róka
Private Telecommunication Networks and Services	(3rd sem., 3-2h)	I.Baroňák
Selected Algorithms of Digital Image Processing	(3rd sem., 3-2h)	I.Bajla
Telecommunication Legislative	(3rd sem., 3-2h)	M.Patakyová
Telecommunication Systems Management	(3rd sem., 3-2h)	M.Medvecký
Wavelets and Filter Banks	(3rd sem., 3-2h)	R.Vargic

### III.3 Undergraduate and Graduate Study for Foreign Students (in English Language)

Telecommunication Technologies	(4th sem., 3-2h)	M.Medvecký,R.Róka
Telecommunications Lines	(5th sem., 3-2h)	R.Róka
Data Communications I.	(7th sem., 4-2h)	R.Róka
Data Communications II.	(7th sem., 0-3h)	J.Oboňa
Digital Circuits and Systems	(7th sem., 4-3h)	J.Hodál
Multimedia	(7th sem., 0-3h)	J.Oboňa
Network Application Software	(7th sem., 4-2h)	I.Grellneth
Digital Communications I.	(8th sem., 0-4h)	P.Farkaš
Mobile Communications	(8th sem., 4-2h)	M.Rakús
Computer Networks	(9th sem., 4-2h)	M.Oravec
Digital Communications II.	(9th sem., 0-4h)	P.Farkaš
Digital Communications III.	(9th sem., 4-2h)	R:Róka

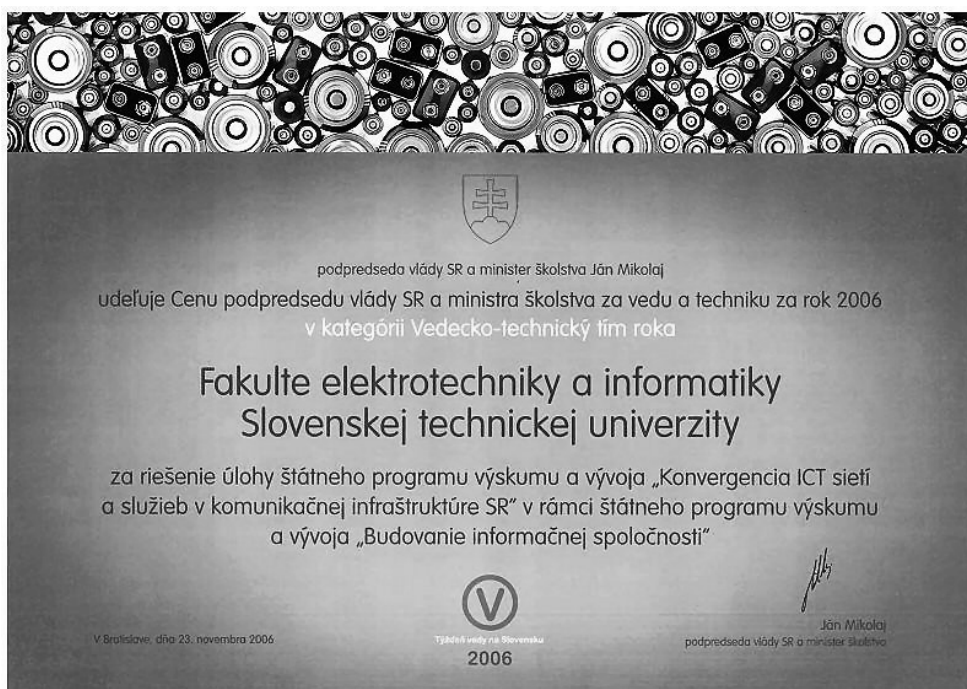
### III.4 Undergraduate Study (Bc. Distance Education Method)

Telecommunications	(3rd year)	M. Orgoň
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## IV. RESEARCH PROJECTS

### IV.1 Awarded Project

For the task solution of the national programme of research and development “Convergence of ICT networks and services in communication infrastructure of SR“ within the scope of the national programme “Building-up the informational society“.



Award of vice premier of SR and President of the Board of Education for science and technique for the year 2006 - In category Scientific and technological team of the year

#### IV.2 Research Projects

- The Communication Infrastructure for Information Society – Next Generation Networks, AV 1002/2004, (2004-2006), I. Baroňák
- The Convergence of ICT Networks and Services in the Communication Infrastructure of SR, State Program of Research and Development - “Building of the Information Society“, (2003-2006), I. Baroňák (national coordinator)
- FP5 NEXWAY IST -2001-37944, Network of Excellence in Wireless Applications and Technology, P. Farkaš
- Analysis and Processing of Low-level ECG Signals with Diagnostics in Practice VTP 18/2004 (2004-2006), G. Rozinaj
- The Intelligent Speech Communication Interface, State Program of the Research and Development - Building of the Information Society, (2003-2006), G. Rozinaj (university coordinator)
- Virtual Reality of Multimedia Speech Synthesis VTP 1003/2003 (2003-2006), G. Rozinaj
- Application of ICT Technologies and New Generation Network Platforms in Education, State Program of Research and Development - “Building of the Information Society“, (2003-2006), P. Podhradský
- LEONARDO ELEFANTS, No: 2004 - CZ/04/B/P/PP/168012, (2004-2007), educational project, P. Podhradský

- High Speed Optical Packet Switching Networks and Quality Management in the Environment of Backbone Optical Networks, VEGA1048/04 (2004-2006), I. Kotuliak
- Traffic in Converged Telecommunication Systems and Networks, VEGA 1/3118/06 (2006-2008), I. Baroňák
- Creating Ubiquitous Intelligent Sensing Environments (CRUISE), European Commission 6th Framework Program (FP6 NoE-IST-4-027738, 2006-2007), P. Farkaš
- Sophisticated techniques for transmission and coding of information in telecommunications and sensor networks, VEGA 1/3113/06, (2006-2008), P. Farkaš
- Web learning for knowledge transfer from project FP 6 CRUISE, KEGA 3/4197/06, (2006-2008), P. Farkaš
- Algorithms and Methods of the Digital Signal Processing, Control Processes of the Converged Networks and NGN Platform and New Generation of the Multimedia Services and Applications, VEGA 1/3094/06 (2006-2008), P. Podhradský
- NGN – Multimedia, Multimedia ICT, Network Platforms, Multimedia Services and Network Security, ESF project, ITMS: 13120110126, No: DP 143/05-I/32-2.1 (2006-2008), P. Podhradský
- Non-linear Processing of Multimedia and Biomedical Signals in Telecommunications, VEGA 1/3110/06 (2006-2008), G. Rozinaj
- Measurement and Diagnosis of Lowlevel ECG signals Using Non-invasive Methods, AV123/06 (2006-2008), G. Rozinaj
- CII-HU-0008-01-0607 – Telecommunications, CEEPUS project, (2006-2007), G. Rozinaj
- Recognition of Human Face Images as the Part of Biometric Methods for Increasing the Security of Open Society, VEGA 1/3117/06, (2006-2008), M. Oravec

## **V. COOPERATION**

### **V.1 Cooperation in Slovakia**

- Agrogenofond in Nitra
- Alcasys
- Alcatel Slovakia
- API
- Comenius University in Bratislava
- Council for Broadcasting and Retransmission
- DATA, Bratislava
- EMM p.l.c., Bratislava
- Ericsson Slovakia, Bratislava
- FREQUENTIS p.l.c., Bratislava
- GTS Nextra, a.s.
- ITM, s.r.o.
- Kapsch Telecom s.r.o., Bratislava
- Methodical Pedagogical Centers
- Microsoft Slovakia
- Microstep MIS Slovakia
- Ministry of Agriculture of Slovak Republic
- Ministry of Economy of Slovak Republic
- Ministry of Interior of Slovak Republic
- Ministry of Transport, Posts and Telecommunications of Slovak Republic
- National Agency for Development of Small and Middle Enterprises
- NextiraOne
- Orange Slovakia
- PTT Research Institute, Banská Bystrica
- Siemens PSE Slovakia
- Slovak Agricultural University in Nitra

- Slovak Association of Electrotechnical Companies
- Slovak Statistical Office of Slovak Republic
- Slovak Telecom, a.s.
- Society of Lifelong Learning in Bratislava
- SPP, a.s.
- Technical University in Košice
- Telecommunication Office of Slovak Republic
- Telecommunication Users Group Slovakia
- Teleservis, s.r.o., Bratislava
- Tesla, Liptovský Hrádok
- Tesla, Stropkov
- T-Mobile Slovakia, a.s.
- University of Trnava
- University of Žilina
- Constantine the Philosopher University, Nitra
- VegaCom Slovakia, a.s.
- Volkswagen Bratislava
- Wavetek Wandel & Goltermann
- WiMAX Slovakia

## V.2 International Cooperation

- Aalborg University Center for Person Kommunikation, Denmark
- Alcatel CIT, France
- Alcatel SEL, Stuttgart, Germany
- Alcatel Stuttgart, Germany
- ARC Seibersdorf research GmbH, Austria
- BITMEDIA e-learning solution, Graz, Austria, (daughter company of Siemens Austria)
- Budapest Polytechnic, Hungary
- CELN Prague, CzR
- ČVUT in Prague, CzR
- Ericsson, Sweden
- Fachhochschule Heilbronn, Germany
- Fachhochschule Oldenburg, Ostfriesland, Wilhelmshaven, University of Applied Sciences, Germany
- Economic Chamber, CzR
- Institut National des Télécommunications (INT), Evry, France
- ISEP Paris, France
- KENTEQ Hilversum, The Netherlands
- Kingston University, Faculty of Technology, UK
- Lancaster University, UK
- The Charta 77 Foundation, CzR
- Nortel, Vienna, Austria
- Polish Academy of Sciences Gliwice, Poland
- Politechnica Poznań, Poland
- Rechenzentrum der RWTH Aachen, Germany
- Siemens Vienna, Austria
- T-Mobile, CzR
- Telenor, Norway
- The National and Kapodistrian University of Athens, Greece
- TU Budapest, Hungary
- TU Graz, Austria
- TU Ljubljana, Slovenia
- TU Maribor, Slovenia

- TU Wien, Austria
- TU Zagreb, Croatia
- University of Central Lancashire, UK
- University of Strathclyde, Glasgow, UK
- University of Versailles, France
- University of West Bohemia in Pilsen, CzR
- Universty of Hradec Kralove, CzR
- UPC Barcelona, Spain
- VŠB TU in Ostrava, CzR
- VUT in Brno, CzR

### V.3 Membership in International Organizations and Societies

- IEEE: P. Farkaš, M. Poľaško, M. Rakús, J. Čuchran, R. Róka, J. Oboňa, I. Kotuliak
- Czechoslovakia Section IEEE - Executive Committee Member responsible for Slovakia: P.Farkaš
- IEE: G. Rozinaj, M. Oravec
- Executive committee member - CTF in Slovak Republic: Ivan Baroňák
- CTF in Slovak Republic: I. Baroňák, M.Medvecký
- ETSI: I. Baroňák
- URSI – Official Member in Scientific Commission C - Signals and Systems: P. Farkaš
- IEEE Region 8 Conference Coordinator: P. Farkaš
- IEEE CAS/COM/SP joint Czechoslovakia Chapter- Executive Committee member: P. Farkaš
- Visiting Professor Kingston University: P. Farkaš
- Expert on evaluation of scientific projects for EUROPEAN COMMISSION: P. Farkaš

### V.4 Contracts

- I.Baroňák: Consideration of ISUP version for connection to PSTN (EWSD Slovak Telecom).
- Contract with UPC Bratislava

## VI. THESES

### VI.1 Masters Theses

Masters theses written as part of the 5-year-study plan supervised at the Department of Telecommunications. The names of supervisors are in brackets.

- [1] J.Babec: Digital Watermark into Static Image (J. Kotuliaková)
- [2] D.Čief: Detection of Face Features Used with Multimedial Speech Synthesis (G. Rozinaj)
- [3] J.Čukan: Interexchange Signalling and the Methods of its Solution in the NGN (Next Generation Network) Networks (M. Paulíny)
- [4] P.Farkaš: Analysis Methods for RS Codes Decoding (P.Farkaš)
- [5] M.Chovaňák: Digital Watermarking in the Static Image (J. Kotuliaková)
- [6] J.Ivančík: Modification of Yao's Adaptive Scheme (K. Kotuliaková)
- [7] M.Kiczko: Methods to Guarantee QoS in MPLS Networks (M. Medvecký)
- [8] V.Kurín: NGN networks (M. Halás)
- [9] M.Lednický: Security of Electronic Banking Services (M. Orgoň)
- [10] M.Miškolci: Using Serial Interface for Measurement and Diagnostic of Biological Signals of Thyroid Gland (P. Piš)
- [11] T.Páleník: Extracting Relevant Content from Web Pages (P. Farkaš)
- [12] P.Palházy: Development of the Software for Calculating the Weight Spectra of the Error Correcting Codes (M. Rakús)
- [13] V.Sovič: Data Transmission via DVB Digital Television (T. Černý)

- [14] P.Svitek: Modification of User Program for Comparison of Various Modem Technologies in the Local Loop (R. Róka)
- [15] N.Tóth: Adaptive ARQ Scheme Using the Selfrepairing Codes (K. Kotuliaková)

## **VI.2 Doctoral Theses**

- [1] J. Filanová: Optimization of Multipoint Routing in Telecommunication Networks for Videoconference Need (I. Baroňák)
- [2] K. Kotuliaková: Hybrid ARQ Methods in Wireless Communication Channels (J. Polec)
- [3] A. Březina: Iterative Decomposition of Image Signal with Linear Combined Basis Functions (J. Polec)
- [4] M. Kavacký: Quality of Service in Broadband Networks (I. Baroňák)
- [5] M. Halás: Voice Traffic Optimization Regarding Call Quality in Networks with VoIP Technology (I. Baroňák)
- [6] P.Kvačkaj: Methods of Telecommunication System Control Prediction (CAC) (I. Baroňák)
- [7] Š. Jurko: Low-level ECG Signal Processing (G.Rozinaj)

## **VII. OTHER ACTIVITIES**

### **VII.1 Conferences and Seminars Organized by the Department**

--ELOSYS 2006, October 2006 Trenčín, Slovak Republic, (cooperation with FEI STU Bratislava)

### **VII.2 Special Lectures**

Seminar: Shape Modelling of 3D Objects Using Wavelets, held on 16. 10. 2006 in Seminars in Numeric Geometry at Faculty of Mathematics, Physics and Informatics of CU (R. Vargic)

### **VII.3 Expertise, tenders, international and national commission members**

- I.Baroňák: ETS norms. Member of National Committee TNK No. 41 for Telecommunications, Transformation of ETS Norms in National Environment
- I.Baroňák: Award of J.Murgaš 2006: Member of Committee MDPT SR a SES, Selection Candidate of Award of J.Murgaš for Year 2006
- I.Baroňák: Member of Grant Committee of MDPT SR for Post, Telecommunication and Information Technologies. Bratislava, 2006
- I.Baroňák: Opponent of the projects for GA Czech Republic, Prague, July 2006
- I.Baroňák: Conference with International Participation: ELOSYS 2006, October 2006, Trenčín Slovak Republic, member of Program committee
- I.Baroňák: International Conference - RTT 2006 – Research Telecommunication Technology 2006, September 2006, Brno, member of Program committee
- I.Baroňák: 29th International Conference - TSP 2006 - Telecommunications and signal processing Brno University of Technology, September 2006, Brno, member of scientific committee
- I.Baroňák: ICETA 2006 – International Conference on Emerging Telecommunications Technologies and Applications, Košice, Slovak Republic, September 2006, member of Program committee
- I.Baroňák: Opponent of the projects for VEGA
- I.Baroňák: Opponent of the projects for APVV
- I.Baroňák: Opponent of the projects for State Programme of Research and Development
- P.Farkaš: Accreditations committee of Slovak Government - working group for information sciences, information and communication technologies with responsibility also for the area of automation and telecommunications
- P. Farkaš: Reviewer of the projects for GAČR Czech Republic, December 2006



- P. Farkaš: ISSSTA 2006 Program Committee member and reviewer
- P. Farkaš: WITS 2006, Program Committee member and reviewer
- P. Farkaš: MELECON 2006 Program Committee member
- M. Medvecký: Conference ELOSYS, chairman of the section
- M.Oravec: Working group ENUM, with support of Ministry of Transport, Posts and Telecommunications of Slovak Republic, member
- M.Oravec: Journal of Electrical Engineering, member of Reviewers Committee
- M.Oravec: IEEE Transactions on Vehicular Technology, reviewer
- M.Oravec: Opponent of the projects for VEGA
- M.Oravec: Conference chairman of section: Chairman of section Telecommunications II, conference with international participation, Electrotechnics and Informatics 2006, Trenčín
- J. Pavlovičová: Opponent of the project for GA Czech Republic, Prague, June 2006
- J. Polec: Radioengineering, member of Editorial board
- J. Polec: Opponent of the project for GA Czech Republic, Prague, August 2006
- J. Polec: Opponent of the projects for VEGA
- J. Polec: Opponent of the projects for APVV
- J. Polec: Opponent of the projects for Foundation of SPP
- P.Podhradský: Journal of Electrical Engineering, member of Editorial board
- P.Podhradský: International Journal of Signal and Imaging Systems Engineering (IJSISE), member of Editorial board
- P.Podhradský: Membership in Conference Committees:
  - International conference IWSSIP'2006, September 2006, Budapest, Hungary, member of Program committee and International review committee
  - International conference ELMAR 2006, June 2006, Zadar, member of Program committee and International review committee
  - Nikola Tesla International scientific Symposium, June 2006, member of Program committee
- P.Podhradský: chairman of the board of the State programme "Building of the Information Society"
- P.Podhradský: member of the Ministry board, Ministry of Building Industry and Regional Development SR
- G.Rozinaj: Membership in Conference Committees:
  - International conference IWSSIP'2006, September 2006, Budapest, Hungary, member of Program committee, International review committee
  - New Trends in Speech Processing, 7<sup>th</sup> Scientific Workshop, Bratislava, 6-7 May 2006, chairman of Program committee
- G.Rozinaj: International Journal of Signal and Imaging Systems Engineering (IJSISE) member of Editorial board
- G. Rozinaj: Opponent of the projects for GA Czech Republic, Prague, July 2006
- G. Rozinaj: Opponent of the projects for GA Croatia, Zagreb, September 2006
- G. Rozinaj: Journal of Electrical Engineering, member of Reviewers Committee

## **VIII. PUBLICATIONS**