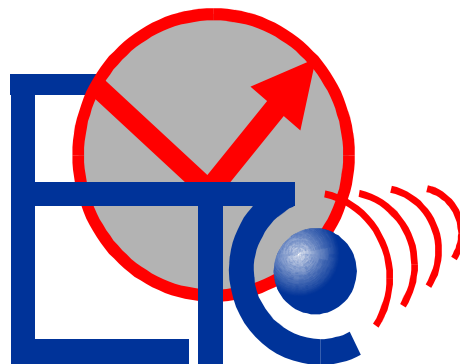


# FACULTY OF ELECTRONICS AND TELECOMMUNICATIONS ENGINEERING



**Bd. Vasile Pârvan, Nr. 2**  
**300223 – Timișoara, Romania**  
**Tel: +40-256-403291, +40-256-403292**  
**Fax: +40-256-403295**

**E-mail: [dean@etc.upt.ro](mailto:dean@etc.upt.ro)**  
**Web: [www.etc.upt.ro](http://www.etc.upt.ro)**



## INTELLIGENT INDUSTRIAL ELECTRONIC SYSTEMS RESEARCH CENTER – I. I. E. S.

### GENERAL PRESENTATION

**Intelligent Industrial Electronic Systems (I.I.E.S.)** is a **research center**, type C, that has been evaluated and accredited by CNC SIS. The Center was created in 11.05.2001, in accordance with the CNC SIS certificate, nr. 106/CC-C. The director of the Center is **prof.dr.eng. Mircea CIUGUDEAN**, PhD supervisor.

### MAIN ACTIVITIES

The Center performs research and design activities in domains such as:

- Robotics (production systems, drive control, mobile robots, sensors)
- Integrated circuits design
- Power electronics (dc-dc converters, power factor correction, neuro-fuzzy control, fuzzy controllers, power active filters)
- Neural networks and intelligent sensors.

### CONTACT

Prof. dr. eng. Mircea CIUGUDEAN – Director  
 Fac. of Electronics and Telecommunications  
 Department of Applied Electronics  
 2, Vasile Pârvan Bul.  
 RO-300223 Timișoara  
 Tel: +40-256-403331  
 Fax: +40-256-403332  
 Web page: <http://www.etc.upt.ro>  
 E-mail: [mircea.ciugudean@etc.upt.ro](mailto:mircea.ciugudean@etc.upt.ro)

### RESEARCH FIELDS

#### **Integrated Circuits Design**

- Keywords: ASIC, VLSI, DA, arithmetic coprocessor

#### **Robotics**

- Keywords: sensor, robot, transducers, industrial robot driving

#### **Neural Computing and Intelligent Sensors**

- Keywords: intelligent sensors, artificial neural network, sensor data processing

#### **Power Electronics**

- Keywords: power converters, power quality, harmonic pollution, power factor correction, soft switching, chaos

#### **Electronic Packaging and Testing Field**

- Keywords: CAE, CAD, CAM, test sequence-generation, self-testing design, test points, EMC, logic analysis, spectral analysis

### Researches in *INTEGRATED CIRCUITS DESIGN*

#### FIELD DESCRIPTION

The research group in this domain is lead by prof. dr. eng. Mircea CIUGUDEAN and also includes an associate professor, one lecturer, three assistants, and three graduate students. The group will grow further by four graduate students and three PhD students per year.

Prof. Mircea CIUGUDEAN, one assistant, and three graduate students additionally work on half-time base with a U.S. based company, SPACEBORNE Inc. Timisoara, specialized in digital and mixed-integrated circuit design. Their gained experience in this company made possible the research development within the IIES Center of the Applied Electronics Department. Professor CIUGUDEAN is also a PhD advisor.

### Researches in *ROBOTICS*

#### FIELD DESCRIPTION

The Research Team in Robotics (RTR) is lead by prof. dr. eng. Tiberiu MURESAN and prof. dr. eng. Ivan BOGDANOV. The team includes one more professor, associate professors, three lecturers and one assistant professor.

The members of the RTR are members of the Robotics Association from Romania which is part of the International Federation of Robotics with the headquarters in Stockholm, Sweden.

In the last years the main research subjects were:

- Pilot intelligent production systems
- Research on passive systems and active intelligent systems interaction
- Microcontroller based control of electrical drives
- Interpolation in robot control
- Mobile robots control
- Sensors for robotics
- Equipment for leading the welding heads.

The Robotics Research Team uses six PC computers and simulation software.

### INTERNATIONAL PROGRAMMES

*SIARAS, Skill-based Inspection and Assembly for Reconfigurable Automation Systems*

*Participant as:* Team member

*Program:* EU Sixth Framework Programe  
 FP6- 017146, 2005

Total value: 1,000,000 EURO (35,000 EURO for UPT)

Members:

1. Fraunhofer Gesellschaft zur Förderung der angewandten Forschung e.V., D
2. Asentics GmbH & Co.KG, D
3. ABB Automation Technologies AB, D
4. Sick AG, D
5. Inos Hellas SA, GR
6. Lunds Universitet, SW
7. "Politehnica" University of Timisoara, RO
8. S.C. Robcon SRL, RO

#### FIELD AND GRANT DESCRIPTION

The project concerns about the novel concept "skill-based manufacturing", i.e. production units with embedded knowledge about their skills being able to interact to solve a given manufacturing task. Given the situation of the existing highly automated manufacturing systems, the automate design and/or reconfiguration of the known manufacturing systems has to be achieved.

#### ACTIVITIES AND RESULTS

- Modelling the skills of the systems components (actuators, sensors, robots, machines, machine components);
- Matching and modelling of production tasks;
- Creating of two main servers: the Skill Server and the Task Server for the main data bases;
- Skill-Mining;
- Automate design of systems configuration.

#### RESEARCH TEAM

Prof.dr.eng. Ivan Bogdanov  
 Prof.dr.eng. Tiberiu Muresan  
 Prof.dr.eng. Virgil Tiponut  
 Prof.dr.eng. Vasile Gui  
 Prof.dr.eng. Alimpie Ignea  
 Prof.dr.eng. Dan Stoiciu,  
 Lect.dr.eng. Cătălin Căleanu  
 Assist.eng. Dan Andreiciuc

Contact person:

Prof. Ivan Bogdanov  
 Tel: +40-256-403338  
 E-mail: [ivan.bogdanov@etc.upt.ro](mailto:ivan.bogdanov@etc.upt.ro)

#### Researches in NEURAL COMPUTING AND INTELLIGENT SENSORS

The research group is coordinated by prof.dr.eng. Virgil TIPONUT and includes three assistant professors from the Department of Applied Electronics, 8 post-graduates from other universities in Romania and industrial companies (Romania, Canada, USA), who are developing their PhD thesis.

#### FIELD DESCRIPTION

- VLSI Implementation of Cellular Neural Networks (CNN)

- Applications of CNN in Intelligent Sensors
- Applications of CNN in Robotics (Mobile Robots and Colony of Interacting Robots)

The research activities are also focused in the field of Computational Intelligence (CI) applications. Using CI paradigms problems like biometrics - face detection and recognition, time series prediction or autonomous mobile robot navigation are tackle. For coding purpose, mainly MATLAB and C are employed.

Hardware/Software resources:

- General purpose PC compatible computers
- DSP boards from Texas Instruments
- Microconverter boards from Analog Devices
- Software development tools
- Prototyping facilities

#### RESEARCH PROJECTS

##### CNCSIS grant No. 639, type A, *Integrated Environment for Assisted Movement of Visually Impaired*

Director: Prof.dr.eng. Virgil TIPONUT

Value: 30,000 RON

Members: Prof.dr.eng. Alexandru GACSADY

Lect.eng. Calin LAR

Lect.dr.eng. Stefan ONIGA

Lect.eng. Ioan GAVRILUT

Lect.eng. Ciprian GAVRINCEA

Assist.eng. Laviniu TEPELEA

#### FIELD AND GRANT DESCRIPTION

The project aims to an integrated environment that improves the mobility of visually impaired into a limited area. The proposed solution includes a wearable equipment, placed on to the subject, that guides the blind user to navigate autonomous with obstacles avoidance and a stationary equipment, which supervises the motion, in order to avoid some unexpected events.

#### ACTIVITIES AND RESULTS

- Design of the architecture of an integrated environment for assisted movement of visually impaired,
- Ultrasonic/visual sensor module development,
- GPS/GSM unit development.

##### CNCSIS grant AT 69, nr. 27688 / 14.03.2005 *Artificial Intelligence in building a face detection and recognition system*

Value: 10,000 RON

Director: Lect.dr.eng. Cătălin-Daniel Căleanu

Members: Lect.dr.eng. Muguraş Mocofan

Assist.eng. Valentin Maranescu

Caciora Radu, student

Adrian Harea, student

## FIELD DESCRIPTION

As a consequence of the international status-quo, an increasing interest has been found for security and surveillance applications. Among them, facial detection and recognition represent a key paradigm, having the advantage of being a passive and nonintrusive technique. Main purposes of the present project are: search for an appropriate AI based architecture for the problem of facial detection and recognition and the design and implementation of such system (PC + video camera or dedicated hardware) having real time capabilities. The research work is focused on investigation of features extracting techniques (e.g. interest operator, Gabor filtering, self-organizing neural networks) and on finding a face recognition suitable neural classifier architecture.

## ACTIVITIES AND RESULTS:

- A study of the most appropriate features extracting techniques for the facial recognition problem
- A study of the most appropriate classification schemes for the facial recognition problem
- Software implementation of a facial detection and recognition system
- As grant results, two proposed articles in international periodicals were made.

## RESEARCH TEAM

Prof.dr.eng. Alexandru GACSADY  
 Lect.dr.eng. Catalin CALEANU  
 Lect.eng. Aurel FILIP  
 Lect.eng. Calin LAR  
 Lect.eng. Ioan GAVRILUT  
 Assist.eng. Laviniu TEPELEA

*Contact person*

Prof.dr.eng. Virgil TIPONUT  
 Tel: +40 256 403337  
 E-mail: [virgil.tiponut@etc.upt.ro](mailto:virgil.tiponut@etc.upt.ro)

## Researches in POWER ELECTRONICS

The main research themes investigated are:

- Improvement and development of new high-frequency PWM and resonant dc/dc converter topologies
- Elaboration of new power factor correction circuits
- New control techniques for power factor correction circuits using classical solutions or neuro-fuzzy controllers
- Research on ac-ac matrix converters and the corresponding control methods

- Improvement of the electrical drives using active power filters and fuzzy regulators
- Research regarding topologies and operation improvement of active power filters
- Development of experimental prototypes for the different circuits as resulted from the theoretical research

The research team uses as technical support six PCs, design and simulation software for power electronics, two power analyzers and many other power electronics devices.

For the present, the research team efforts are focused on creating a power quality test center, according to European regulations.

## RESEARCH PROJECTS

**CNCSIS Grant No 32940, theme 16, code 175, A type: Pollution Free Electrical Energy Converters Using Soft-Switching Techniques**

Value: 10,000 RON

Director: Assoc.prof.dr.eng. Dan LASCU

Members: Prof.dr.eng. Viorel POPESCU

Lect.eng. Adrian POPOVICI

Lect.eng. Dan NEGOIȚESCU

Assist.eng. Mircea BĂBĂIȚĂ

Eng. Alin PARASCHIV

Eng. Ovidiu VĂTAFU

## FIELD DESCRIPTION

The purpose of the project is the study, design and experimental results of soft-switching pollution free energy converters, in order to improve energy consumption for industrial and home appliances. All these converters have to comply with international standards of electromagnetic compatibility (e.g. CENELEC, IEC, VDE and IEEE 519 norm) together with high efficiencies and low size and weight.

Extending the soft-switching techniques from dc/dc converters to traditional active power factor correction circuits and to new structures, suitable for a certain technique is the strategy adopted in the project, as a solution for high packing degree. Design algorithms and equations, with models for the proposed architectures, together with computer aided design programs have been and will be developed. A comparative performance study regarding the power quality parameters, simplicity, efficiency and cost has been and will continue to be performed between the elaborated solutions.

The main reason of this project proposal is that in the future energy quality and energy processing improvements will be an important demand for the integration of Romania in the European energy system.

## ACTIVITIES AND RESULTS

- ZCS and ZVS BUCK and BOOST three phase family circuits, including one-cycle control are developed and investigated
- A soft-switching synchronous rectifier based PFC circuit was introduced
- A single-phase BOOST type PFC circuits obtained from a BUCK structure using the duality principle is proposed
- Large signal and small-signal models are developed and controller design using the K factor method was performed
- MATLAB design programs and CASPOC library blocks for simulation were also developed. A comparative analysis between different PFC families was performed regarding dynamical and steady-state behavior.

**CNCSIS Grant No 32940, theme 24, code 187, A type: Modern methods for high efficiency electrical energy processing using matrix converters**

Value: 7,000 RON

Director: Prof.dr.eng. Viorel POPESCU

Members: Assoc.prof.dr.eng. Dan LASCU  
Lect.eng. Adrian POPOVICI  
Lect.eng. Dan NEGOITESCU  
Assist.eng. Mircea BĂBĂIȚĂ  
Eng. Csaba WEKERLE  
Eng. Corneliu JURCA

## FIELD DESCRIPTION

Industrial interest for matrix converters is growing because this type of frequency changers is single stage, they require minimal components, they exhibit high power density and they are very efficient. The matrix converters have received considerable attention with the progress of power devices. The objectives of the research are a theoretical analysis and design approach for matrix converters. Another objective is achievement of a software simulator for matrix converters with friendly graphical interface. In the final we intend to build an experimental model in order to verify the validity of developed theory, simulation models and accuracy of generated control signals.

## ACTIVITIES AND RESULTS

- Comparative analysis of different simulation packages for matrix converters simulation.
- Development of an integrated software simulator.
- Experimental models.

## RESEARCH TEAM

Prof.dr.eng. Viorel POPESCU – head of the group  
Prof.dr.eng. Tiberiu MURESAN  
Assoc.prof.dr.eng. Dan LASCU

Lect.dr.eng. Adrian POPOVICI  
Lect.dr.eng. Dan NEGOITESCU  
Lect.eng. Mircea BABAITA

Researches in *ELECTRONIC PACKAGING AND TESTING*

The research group in this domain is coordinated by prof. dr. eng. Horia CÂRSTEA, and includes two assistants and three graduated-students. The group established relationships with several regional powerful companies in the electronic packaging field, like SOLECTRON, ABB, TELCO and NOVAR. Also, the group has preferential relations with ALCATEL Network System, Romania in the field of testing electronic equipment.

## RESEARCH PROJECTS

**CEEX-MATNANTECH, grant No. 337/2005: Advanced piezoelectric monocrystals with alpha quartz structure in extreme hydrothermal conditions for electronics and communications**

Director: Prof.dr.eng. Horia CÂRSTEA

Value: 37,500 RON

**Contract No. 692/2005: Data Acquisition System for thermic profile control in reflow glue oven**

Director: Prof.dr.eng. Horia CÂRSTEA

Beneficiary: S.C. Telco EFTC

Value: 2,500 RON

## PhD RESEARCH ACTIVITIES

1. Scientific supervisor: Prof.dr.eng. Virgil TIPONUȚ

PhD students:

- Sorin POPESCU: *Contributions to the Optimisation of Welding Robots with Sensors for Seam Tracking*
- Sorin IARCA: *Research Regarding the Developing of a Neural Network Designed for Voice Recognition*
- Marius BUGLEA: *Smart Transducers Array*
- Ioan GAVRILUȚ: *Contributions to the Autonomous Mobile Robot Navigation Using CNN*
- Alexandru DARIE: *Optimizing the Performance of a Mobile Robot Society*
- Ciprian GAVRINCEA: *Researches on a Neural Network Implementation for Processing the Signals Generated by Muscle System*
- Liviu LUCACIU: *Contributions to the Biometric Systems Development and Implementation*
- Marian BURSAȘIU: *Contributions to the Optimization of Neural Network Applications Development*

- Alin BRÎNDUȘESCU: *Optimization of EKG Signals Processing*
  - Ionut MIREL: *Methods for Digital Video Images Processing*
  - Călin LAR: *Contributions to the Sensorial Data Fusion*
  - Laviniu ȚEPELEA: *Human-Machine Interface*
  - Philipp ROEBROCK: *Multi Sensor Controlled Assembly and Application with Manipulators*
2. *Scientific supervisor: Prof.dr.eng. Tiberiu MUREȘAN*
- PhD students:*
- Ioan LIE: *Contributions to the Optimization of the Methods and Electronic Equipments for Ultrasonic Investigation*
  - Solomon MIMIS: *Integrated Circuits for Transmission Bit Error Rate Measurement*
  - Petru PAPAȘIAN: *Intelligent Subsystems for Optimal Control of Technological Processes*
  - Dan Mircea ANDREICIUC: *Analysis and Correction Methods for Positioning and Orientation of Mobile Industrial Robots*
  - Sebastian TIPONUȚ: *Researches regarding the implementation of embedded systems using predefined templates*
3. *Scientific supervisor: Prof.dr.eng. Mircea CIUGUDEAN*
- PhD students:*
- Aurel FILIP: *Researches on CMOS Frequency References*
  - Marllene DANETI: *Propagation time estimation algorithms for noise sources location*
  - Beniamin DRAGOI: *Researches on CMOS Integrated Digital Correlator Conception and Design*
  - Marin DRAGNEA: *High Stability Sine Oscillators*
  - Radu MIHAESCU, *Integrated Optimal Structures for Telecommunication Systems*
  - Iosif MUDRA: *Researches on CMOS Integrated Fast Synchronous Comparators*
  - Bogdan MARINCA: *Ultrasonic Investigation Optimization by Algorithms Implemented in Dedicated Integrated Circuits.*
4. *Scientific supervisor: Prof.dr.eng. Viorel POPESCU*
- PhD students:*
- Mircea BĂBĂIȚĂ: *Researches on a.c.–d.c. converters*
  - Cornel GLISICI: *Contributions regarding improved capabilities of uninterruptible power supplies*
  - Corina IVAN: *Energy parameters optimization in dc-dc converters*
  - Marin TOMȘE: *Contributions to theoretical and experimental study of inductive heating power supplies*
  - Daniel ALBU: *Contributions regarding improved capabilities of switched mode converters with PFC applications*
  - Dorin CIZMAȘIU: *Power factor control in ac-dc conversion systems*
  - Dan SIMU: *Adaptive systems for unconventional technologies*
  - Lucian PĂUN: *DC/DC converters with optimized energy parameters*
  - Adrian ȘCHIOP: *Contributions to theoretical and experimental study of power converters with ac motor drive applications*
  - Cristian VRÂNCILĂ: *Theoretical and experimental contributions regarding active power filters*
5. *Scientific supervisor: Prof.dr.eng. Horia CĂRȘTEA*
- PhD students:*
- Dumitru MĂRGELOIU: *Contributions to the improvement of electronic equipment for monitoring and controlling of low and medium voltage electrical network parameters*
  - Ovidiu MIȚARIU: *Contributions to the improvement of autotesting equipment in digital data conditioning and transmission*
  - Mirel BURLACU: *Research regarding CMOS analog integrated circuits based on unconventional principles*
  - Corneliu TRIPA: *Contributions to the development of fault diagnose and identification tests in applied electronics equipment*
  - Mircea RIF: *Automated system for data acquisition, processing and management in industry*
  - Mircea MIHĂESCU: *Contributions to the development of dynamical diagnose and reconfiguration tests in digital fault redundant systems*

- Liviu ION: *Contributions to the development of digital regulation in electrical driven industrial processes*
- Narcis NAGY: *Contributions to the study of meteorological phenomena effects on electronic communication systems*
- Răzvan GUMA: *Contributions to the development of strategies for identification and detection of defections in autotesting electronic equipment*
- Andy BERCOVICI: *Contributions to the increase of fiability in digital electronics equipment*

#### PHD THESIS SUSTAINED

1. Stefan ONIGA, *Sensorial System for Human Gesture Recognition Using ANN Implemented in a FPGA*, Scientific supervisor: Prof.dr.eng. Virgil TIPONUȚ
2. Dan NEGOITESCU, *Contributions Regarding Performant Power Factor Correction Techniques in Supply Systems*, Scientific supervisor: Prof.dr.eng. Viorel POPESCU

#### PhD ESSAYS PRESENTED

1. Marllene DĂNEȚI, *Spectral estimation algorithms*
2. Marllene DĂNEȚI, *Locating of noise sources by signal pocessors*
3. Marllene DĂNEȚI, *Algorithms for time delay estimation*
4. Beniamin DRAGOI, *Digital Correlator Chip Conception and Design*
5. Ioan LIE, *Actual Conceptions Regarding Hardware Structure of Digital Beamformers*
6. Ioan LIE, *Possibilities to Optimize Hardware and Software Structures of the Electronic Equipment for Ultrasonic Investigation*
7. Bogdan MARINCA, *Actual stadium in the Ultrasonic Investigation Proceeding Domain*
8. Iosif MUDRA, *Simulation and design of CMOS Synchronous Comparators*
9. Petru PAPAȘIAN, *Actual Design Stage of Intelligent Sensors and Actuators*

#### PUBLICATIONS

##### BOOKS

1. Băbăiță, M., *Control Devices and Equipment for Electrical Drives*, West Publishing House, Timișoara, 2005, ISBN 973-36-0411-9, 286 pages, (published in Romanian)

2. Gacsadi, A., Tiponut, V., *Data Acquisition Systems*, University of Oradea Publishing House, 2005, ISBN 973-613-868-2, 190 pages, (published in Romanian)
3. Ionel, S., *Spectral Estimation with MATLAB Experiments*, Politehnica Publishing House, Timisoara, 2005, ISBN 973-625-293-0, 120 pages, (published in Romanian)
4. Ionel, S., *Electronic Devices and Circuits*, Politehnica Publishing House, Timisoara, 2005, ISBN 973-625-124-1, 302 pages, (published in Romanian)
5. Ionel, S., Bugan, M., Ionel, R.C., *Elements of Methodology. Direct Exploration Methods in the Electrical and Electronic Fields*, Politehnica Publishing House, Timisoara, 2005, ISBN 973-625-257-4, 120 pages, (published in Romanian)
6. Muresan, T., Gontean, A., *Digital Circuits*, West Publishing House, Timisoara, 2005, ISBN 973-613-868-2, 218 pages, (published in Romanian)
7. Popescu, V., *Power Electronics*, West Publishing House, 2005, ISBN 973-36-0412-7, 240 pages, (published in Romanian)

#### PUBLISHED PAPERS

1. Avram, A., Carstea, H., Tanase, M.E., Lie, I., *The Impact of Manufacturing Issues above Lead Free Soldering Alloys*, Proceedings of the 28<sup>th</sup> International Spring Seminar on Electronics Technology, ISSE 2005, May 19-22, 2005, Wiener Neustadt, Austria, pp. 279-282
2. Balas, M., Ciugudean, M., Balas, V., *The family of fuzzy self-adaptive interpolative controllers. Perspectives*, Journal of Inventics, Nr. 48, 2005, pp. 13-23
3. Băbăiță, M., Papazian, P., Popovici, A., Avram, A., Lie, I., *New Control Techniques for Hibrid Regulator*, ICMCS-05, Proceedings of the 4<sup>th</sup> International Conference on Microelectronics and Computer Science, 15-17 September 2005, Technical University of Moldavia & Academy of Sciences of Moldavia, Chișinău, Vol. II, ISBN 9975-66-040-1, 2005, pp. 405-408
4. Băbăiță, M., Papazian, P., Popovici, A., Avram, A., Tănase, M.E., *New control techniques for hybrid regulator*, Proceedings of the 4<sup>th</sup> International Conference on Microelectronics and Computer Science ICMCS 2005, Chisinau, Republic of Moldavia, 15-17 September 2005, ISBN 9975-66-040-1, pp. 406-409



5. Babaița, M., Popovici, A., Avram, A., Popescu, V., *A new technique for hybrid controller used for DC motor drive*, Proc. 8<sup>th</sup> International Conf. on Eng. of Modern Electric Systems, Oradea, 26-28 May 2005, pp. 25-29
6. Babaita, M., Popescu, V., Popovici, A., Lascu, D., Negoitescu, D., *Control Technique With Fast Response For Power factor Correction Rectifiers*, WSEAS International Conf. on Dynamic Systems and Control (Control'05), 2005, pp. 421-426
7. Carstea, H., Golet, I., Mitariu O., *Detecting errors sequential testing method, within electronic equipment, using non-uniform covering probabilities*, Annals of the University of Oradea, May 2005, pp. 29-33
8. Carstea, H., Rif, M., Bercovici, A., *Method and transducer for measuring and controlling thin films layers*, Annals of the University of Oradea, May 2005, pp. 33-37
9. Carstea, H., *Optimal corrective maintenance strategies applied to high-reliability electronic equipments*, International Symposium for Design and Technology of Electronic Packaging, Cluj-Napoca, September 2005, pp. 199-202
10. Carstea, H., Bercovici, A., *Methods and models of thermal analysis for the electronic modules*, International Symposium for Design and Technology of Electronic Packaging, Cluj-Napoca, September 2005, pp. 293-295
11. Carstea, H., Ionascu, P., *The protection of electronic equipments at electrostatic charges and discharges generated perturbations*, Second Workshop of Electromagnetic Compatibility, Cluj-Napoca, September 2005, pp. 44-62
12. Ciugudean, M., Filip, A., Avram, A., Pantis, M., *A New High Stability Sine Oscillator with Simulated Inductance*, Proceedings of the 4th International Conference on „Microelectronics and Computer Science” ICMCS-05, Chisinau, Moldavia, September 15-17, 2005, ISBN 9975-66-040-1, pp. 356-359
13. Gacsadi, R., Reiz, I., Gavrilut, L., Tepelea, V., Tiponut, V., *Noise removal in images by using cellular neural networks*, Proceedings of the International Conference on Engineering of Modern Electric Systems (EMES'2005), Oradea, 2005, pp. 47-53
14. Gavrilut, A., Gacsadi, L., Tepelea, V., Tiponut, V., *Motion planning for two mobile robots in an environment with obstacles by using cellular neural networks*, Proceedings of the 7<sup>th</sup> International Symposium on Signals, Circuits and Systems, (ISSCS 2005), ISBN 0-7803-7979-9, Iasi, Romania, 2005, pp. 801-804
15. Gavrilut, A., Gacsadi, L., Tepelea, V., Tiponut, V., *Target search by mobile robot in a labyrinth by using cellular neural networks*, Proceedings of the International Conference on Engineering of Modern Electric Systems (EMES'2005), ISSN 1454-9239, Oradea, 2005 pp. 54-59
16. Ionel, S., *Correlative Analysis Parameters of Air Quality*, Fachtagung der Alexander von Humboldt Stiftung, vol. 2, Politehnica Publishing House, ISBN 973-625-204-3, pp. 175
17. Ionel S., Ionel, I., Bisorca, D., *Correlation Analysis for Traffic Induced Pollution*, Proceedings of the EAEC European Automotive Congress, May 2005, Belgrade, ISBN 86-8941-30-1.
18. Ionel, I., Ionel, S., *Short-Time spectra and Correlation Analysis of Air Pollution Signals*, Proceedings of the 14<sup>th</sup> International Conference on Thermal Engineering and Thermogrammetry, June 2005, Budapest.
19. Ivan, C., Popescu, V., *PFC circuits – performances and characteristics*, Proc. of the 8<sup>th</sup> Int. Conf. on Eng. of Modern Electric Systems, Oradea, 26-28 May, 2005, pp 80-86
20. Keller, G., Lascu, D., Myrzik, J., *State-Space Control Structures for Buck Converters with / without Input Filter*, 11<sup>th</sup> European Conference on Power Electronics and Applications, EPE 2005, Dresden, Germany, pp. 171-180.
21. Koczy, L.T., Balas, M., Ciugudean, M., *On the interpolative side of Fuzzy Sets*, IEEE International Workshop on Soft Computing Applications (SOFA), Proceedings, Szeged, Hungary and Arad, Romania, August 2005, pp. 17-23
22. Lascu, D., Popescu, V., Lascu, M., *A new BOOST converter and some of its applications*, Proc. of the 8<sup>th</sup> Int. Conf. on Eng. of Modern Electric Systems, Oradea, 25-28 May, 2005, pp 90-93
23. Lascu, D., Popescu, V., Negoitescu, D., Popovici, A., Lascu, M., Babaita, M., *Modelling, Analysis, Simulation and Experimental Results Regarding a New Boost Converter Topology*, WSEAS International Conference on Dynamical Systems and Control (Control'05), Venice, Italy, Nov. 2-4, 2005, pp. 433-438
24. Lie, I., Tanase, M.E., *Optimizing the Cost to Quality Ratio in Ultrasonic Imaging*, Proceedings of the 4<sup>th</sup> International Conference

- on Microelectronics and Computer Science ICMCS–2005, 15-17 September 2005, Chisinau, Republic of Moldavia, pp. 393-396
25. Lie, I., Tanase, M.E., *A Sing-Around Ultrasonic Low Power Flowmeter*, Proceedings of 2005 WSEAS Int. Conf. on Dynamical Systems and Control, Venice, Italy, November 2-4, 2005, pp. 174-176
  26. Lie, I., Tanase, M.E., *A Compact FPGA Beamformer Architecture*, Proceedings of 2005 WSEAS Int. Conf. on Dynamical Systems and Control, Venice, Italy, November 2-4, 2005, pp. 463-466.
  27. Lie, I., Tanase, M.E., *About the Possibility to Implement a Nonuniform Oversampling Receive Beamformer in a FPGA*, 2005 Proceedings of the IEEE International Ultrasonics Symposium, Rotterdam, the Netherlands, September 18-21, 2005, pp. 1404-1407.
  28. Lie, I., Tanase, M.E., Carstea, H., Avram, A., *FPGA Implemented Decimating Filter*, Proceedings 28<sup>th</sup> International Spring Seminar on Electronics Technology, ISSE 2005, May 19-22 2005, Wiener Neustadt, Austria, pp. 115-119
  29. Maranescu, V., Căleanu, C., Mocofan, M., *Stimulus generator for spice simulations using graphical programming language*, Annals of the "Eftimie Murgu" University in Reșița, Romania, Sept. 2005
  30. Neamtu, O., Tiponut, V., *PC Interface for PWM invertors*, Proceedings of the National Symposium of Theoretical Electrical Engineering SNET' 05, Bucharest, 12-14 May 2005, ISBN 973-618-268-5, pp. 319-322
  31. Negoitescu, D., Popescu, V., *CUK converter with ripple-free input current and uncoupled inductors*, Proc. of the 8<sup>th</sup> Int. Conf. on Eng. of Modern Electric Systems, Oradea, 26-28 May, 2005, pp. 102-106
  32. Papazian, P., Băbăiță, M., Popovici, A., Avram, A., Lie, I., *Signal Generating Techniques using PIC16F84 Microcontrollers*, ICMCS-05, Proceedings 4<sup>th</sup> International Conference on Microelectronics and Computer Science, 15-17 September 2005, Technical University of Moldavia & Academy of Sciences of Moldavia, Chișinău, Vol. II, 2005, pp. 4001-404
  33. Popa, D. Toma, C., Tănase, M.E., *On the errors in telemetering of the movement features with Doppler radiotelemetry system*, Proceedings 4<sup>th</sup> International Conference on Microelectronics and Computer Science ICMCS–2005, 15-17 September 2005, Chisinau, Republic of Moldavia, pp. 385-388
  34. Popovici, A., Popescu, V., Babaita, M., Lascu, D., Negoitescu, D., *Modeling Simulation and Design of Input Filter for Matrix Converters*, WSEAS International Conference on Dynamical Systems and Control (Control'05), Venice, Italy, Nov. 2-4, 2005, pp. 439-444
  35. Schiop, A., Popescu, V., *Considerations about power systems simulation based on PSPICE*, Proc. of the 8<sup>th</sup> Int. Conf. on Eng. of Modern Electric Systems, 26-28 May, 2005, Oradea, pp. 120-124
  36. Schiop, A., Popescu, V., *Considerations on the speed controllers for vector controlled induction motor drives*, International Symp. on Signal, Ciccuits, and Systems, Iași, July 2005, pp. 461 – 465
  37. Schiop, A., Popescu, V., Trip, D., *A control scheme for three level inverter*, International Symp. on Signal, Circuits and Systems, Iași, July 2005, pp. 465-468
  38. Tanase, M.E., Carstea, H., Avram, A., *Frequency exchanger from electronic telemetering equipments of movement features*, International Spring Seminar on Electronics Technology ISSE 2005, Viena, Austria, May 2005, pp. 469-472
  39. Tanase, M.E., Lie, I., Marinca, B., Băbăiță, M., *Digital signal generator for exciting an area of ultrasonic transducers*, Proceedings of the 4<sup>th</sup> International Conference on Microelectronics and Computer Science ICMCS–2005, 15-17 September 2005, Chisinau, Republic of Moldavia, pp. 397-400
  40. Tanase, M.E., Lie, I., Carstea, H., Marinca, B., Avram, A., *Frequency Exchanger from Electronic Telemetering Equipment of Movement Features*, Proceedings 28<sup>th</sup> International Spring Seminar on Electronics Technology, ISSE 2005, May 19-22 2005, Wiener Neustadt, Austria, pp. 212-217
  41. Tănase, M.E., Toma, C.I., Tănase, R., *On using ultrasound waves in intelligent robots self-guidance*, Book of Abstracts, 27<sup>th</sup> Colloquium of Automation, Salzhausen, Bremen, Germany, 11-12 November 2005, pp. 25-26
  42. Tanase M. E., Tanase, R., *Optimising of the Power Transfer from the Electrojnrc Generator to the Ultrasonic Transducers*, Scientific Bulletin of the "Politehnica" University of Timisoara, Timisoara, in Trans. on Power Engineering, Tom 50(64), Fasc. 1-2, 2005, ISSN 1582-7194, pp. 330-334.

43. Tiponut, V., Tepelea, L., Lar, C., Gavrilut, I., Gacsadi, A., *An integrated environment for assisted movement of blind persons*, Proceedings of the International Conference on Engineering of Modern Electric Systems (EMES'2005), ISSN 1454-9239, Oradea, 2005, pp. 128 -131

#### RESEARCH TEAM

- Prof.dr.eng. Mircea CIUGUDEAN: *Conception of Analog Integrated Circuits and their Applications*
- Prof.dr.eng. Tiberiu MUREȘAN: *Digital Circuits, Industrial Robot Driving, Switched Mode Power Supplies*
- Prof.dr.eng. Viorel POPESCU: *Switched-Mode Power Supplies, Industrial Electronics*
- Prof.dr.eng. Virgil TIPONUȚ: *Analog Electronic Circuits, Logic Programmed Systems, Sensors and Transducers, Neural Networks*
- Prof.dr.eng. Mihail Eugen TĂNASE: *Doppler Telemetry*
- Prof.dr.eng. Ivan BOGDANOV: *Industrial Robots, Computer control of electrical drives*
- Prof.dr.eng. Sabin IONEL: *DSP applications, Statistical signal processing, Failure diagnosis*
- Prof.dr.eng. Horia CĂRSTEA: *Electronic Technology, Electrical Equipment Testing*
- Assoc.prof.dr.eng. Ioan JIVETȚ: *Designing ASIC (VLSI) Circuits, Design of Digital Systems with Micro-Controllers and Micro-Processors, Clinical Applications of Electrical Bio-impedance Tomography*
- Assoc.prof.dr.eng. Aurel GONTEAN: *Programmed Logic Systems, Digital Circuits*
- Assoc.prof.dr.eng. Dan LASCU: *High Frequency Power Processors, Power Factor Correction Circuits, Switched-Mode Power Supplies, CAD Design in Power Electronics*
- Assoc.prof.dr.eng. Dan ANDREICIUC: *Industrial Robots, Mobile Robots*
- Assoc.prof.dr.eng. Dorina ISAR: *Industrial Process Control Equipment, Signal Processing for Signal / Noise Ratio Enhancement*
- Lect.dr.eng. Lucian JURCA: *Analog Electronic Circuits*
- Lect.dr.eng. Adrian POPOVICI: *Industrial Electronics, Materials for Electronics*
- Lect.dr.eng. Cătălin CĂLEANU: *Electronic Devices and Circuits*
- Assist.eng. Aurel FILIP: *Analog Electronic Circuits*
- Assist.eng. Sorin POPESCU: *Analog Electronic Circuits, Logic Programmed Systems*
- Assist.eng. Ioan LIE: *Electronics, Doppler Telemetry*
- Assist.dr.eng. Dan NEGOIȚESCU: *Industrial Electronics, Power Factor Correction Circuits*
- Assist.eng. MIRCEA BĂBĂIȚĂ: *Digital Circuits*
- Assist.eng. Valentin MARANESCU: *Conception of Analog Integrated Circuits*
- Assist.eng. Benjamin DRĂGOI: *Conception of Analog Integrated Circuits*
- Assist.eng. Marlene DĂNEȚI: *DSP applications, Statistical signal processing, Failure diagnosis*
- Assist.eng. Petru PAPAȘIAN: *Digital Circuits*
- Assist.eng. Bogdan MARINCA: *Doppler Telemetry*

## DEPARTMENT OF COMMUNICATIONS

### RESEARCH GROUP IN SIGNAL PROCESSING

#### RESEARCH FIELDS

- Adaptive signal processing
- Image processing
- Digital watermarking
- Time-frequency representations
- Wavelets theory applications
- Multiresolution analysis
- Nonlinear signal processing
- Neural networks
- Coding
- Compression
- Communication networks

#### KEYWORDS

Signals Circuits and Systems, Adaptive Signal Processing, Time-Frequency Representations, Wavelets Theory and Applications, Nonlinear Signal Processing, Neural Networks, Image Processing, Microwave Technique, Theory of Information and Coding, Data Transmission, Modern Communication Networks, Telecommunication Circuits, Digital Signal Processing, Digital Watermarking, Data Transmission on Radio Channels, Mobile Radio Communications

### RESEARCH PROJECTS

**CNCSIS grant no 27688/14.03.2005, Code 29, type A, *Digital receiver performance enhancement using the wavelet theory***

*Director:* Prof.dr.eng. Alexandru ISAR,

*Value:* 16,000 RON

*Members:* Prof.dr.eng. Miranda Naforniță

Prof.dr.eng. Andrei Câmpeanu

Assoc.prof.dr.eng. Dorina Isar

Lect.dr.eng. Cornel Balint

Assist.eng. Horia Balta

Assist.eng. Radu Lucaciu

Assist.eng. Andy Vesa

Assist.eng Mirela Vior

Assist.eng. Corina Nafornita

Student Virgil Popovici

Student Cristian Delfi

Student Calin Puscas

Student Cristina Torok

#### FIELD DESCRIPTION

The study and implementation of some denoising techniques based on wavelet theory.

The simulation of some Maximum A Posteriori filters for the treatment in the wavelet transform domain with parameters adapted to different classes of communication signals perturbed by different kinds of noise.

#### ACTIVITIES AND RESULTS

A number of 8 dissertations were sustained and a number of 10 papers were published in journals and proceedings this year.

**CNCSIS grant no.32940/2004, theme 6, code 517, type A, *Nonlinear methods and techniques in telecommunications***

*Director:* Lect.dr.eng. Georgeta BUDURA,

*Value:* 20,000 RON

*Members:* Prof.dr.eng. Miranda NAFORNITA

Prof.dr.eng. Ioan NAFORNITA

Lect.dr.eng. Corina BOTOCA

Assist.eng. Maria KOVACI

Assist.eng. Mirela BIANU

Assist.eng. Janos GAL

Dr. Ileana POPESCU

Eng. Marius OLTEANU

Eng. Marius SALAGEAN

#### FIELD DESCRIPTION

The research activities were oriented on practical solutions offered by the nonlinear models in the field of telecommunications. Two directions were considered: the methods of identifying and compensating unwanted nonlinearities based on the use of approximate nonlinear inverses to apply post-distortion and the nonlinear equalizers based on neural networks. In the first case the techniques that are considered can be subdivided into two main groups: time-invariant nonlinear models without memory (the power series and the orthogonal

polynomial representations), and time-invariant nonlinear models with memory (the Volterra and the Wiener models). In the second one the research activities were oriented on the implementation of neural equalizers based on radial basis functions.

#### ACTIVITIES AND RESULTS

A number of 9 papers were published in journals and proceedings this year and 5 diploma thesis were sustained.

**CNCSIS grant No. 34702/24.06.2005, Code 47, type TD, *Digital watermarking of images in the transform domain***

*Director:* Assist.eng. Corina NAFORNITA

*Value:* 4,000 RON

#### FIELD DESCRIPTION

In the Internet communication era, the piracy of the multimedia products can be fought through watermarking. The marks can be either visible or invisible (safer because they aren't distinguishable). The image watermarking for authentication of intellectual property should allow: marking the original image; extraction of the mark from the received image; comparison between the two marks. Current techniques for image watermarking are spatial domain methods or frequency domain methods. The second one is used frequently and is more versatile. A topic research subject in this matter is finding the best transform, invariant to usual operations (translation, rotation, scaling etc). The mark must have useful information about the owner and the original image. A coding technique generates the mark. The transmission (mostly because of the compression) affects the image (hence the mark). Therefore the original and extracted marks are not identical. Turbo-codes have a high-correcting capacity; therefore they can be used when generating the mark. To compare the two marks, we compute the cross-correlation between them. The goal of this project is to propose robust watermarking methods using turbo-codes and other coding techniques and to investigate the applicability of watermarking for content authentication from multiple points of view (information transmission theory, signal processing, and telecommunications). We look for the best ways to embed, extract and compare the marks. We shall implement the software algorithms for the given methods.

#### ACTIVITIES AND RESULTS

Research has been done to understand the present watermarking techniques and their applications. We have published on the webpage of the Communications Dept, Electronics and Telecommunications Faculty, Polytechnica University of Timișoara, <http://hermes.etc.utt.ro> a research report entitled "State-of-the art in watermarking in the transform domain" that investigates the image watermarking techniques in

the transform domain. Its content deals with the very actual problem of electronic commerce, and copyright protection of multimedia data (video, audio, images etc). The second report written in English entitled *Watermarking in the wavelet domain* has been published at Politehnica Pub. We show basic concepts, classification of different watermarking techniques; the duality problem between watermarking and steganography towards compression is presented. We describe basic models used in watermarking, knowing the fact that this area lies between several research areas (steganography, spread spectrum communications, authentication, encryption, data fusion, human perception, fading etc). We give evaluation criteria for watermarking (imperceptibility, peak signal-to-noise ratio, correlation between original and extracted watermark, false positive/negative). We show advantages of watermarking in the transform domain for copyright protection, that proves to have higher performance against lossy compression, and other types of unintentional attacks. We propose our own method of watermarking that works in the wavelet domain, and uses the human visual perception and statistical characteristics of the DWT. We compare the results with another well-known method that uses spread-spectrum techniques. Our method shows a higher performance. The results have been published in papers and a book.

#### INTERNATIONAL PROGRAMMES

**Grant type, Brancusi 08886TM, *Debruitage des images SONAR en utilisant la theorie des ondelettes : applications aux systemes d'aide a la decision***

*Director:* Assoc.prof.dr.eng. Sorin MOGA, ENST-Bretagne

*Value:* 1843 EURO

*Partners:* ENST-Bretagne, Brest, France

*Members:* Prof.dr.eng. Jean-Marc BOUCHER, ENST-Bretagne, Brest, France  
Assoc.prof.dr.eng. Dominique PASTOR, ENST-Bretagne, Brest, France  
Prof.dr.eng. Ioan NAFORNITA, UPT  
Prof.dr.eng. Alexandru ISAR, UPT  
Assoc.prof.dr. Corina BOTOCA, UPT

#### FIELD AND GRANT DESCRIPTION

A new SONAR images denoising method, based on wavelets theory is developed. This is a pre-treatment method. Its results enhance the quality of post-treatment techniques like segmentation and classification.

#### ACTIVITIES AND RESULTS

Two research reports and four articles were published.

**Contract with Ministry of Development Greece, and INTRACOM SA, Greece, *Developement of***

***Software Defined Radio Platform: Optimal Usage of Radio Resources and Multiple Air Interface Terminals***

*Director:* prof.dr.eng. Ioan NAFORNITA

*Value:* 140,000 EURO

*Partner:* National Technical University of Athens, Greece, Prof. Philip CONSTANTINOU

#### PUBLICATIONS

##### BOOKS

Naornita, C., *Watermarking in the wavelet domain*, Politehnica Publishing House, Timisoara, 2005, ISBN 973-625-236-1, 42 pages, (published in English)

##### PAPERS

- Balint, C., *Efficient LSP Computation and Quantization*, International Symposium on Signals, Circuits and Systems ISSCS 2005, Iași, July 14-15, 2005, Vol. 1, ISBN 0-7803-9029-6, pp. 175-178
- Balta, H., Kovaci, M., Naforniță, M., *A New Method for the Simulation of the Nakagami Flat Fading (Radio) Transmission Channels*, Annals of the University of Oradea, Fasc. Electrotehnics, Electronics, 2005, ISSN 1454-9239, pp. 21-24
- Balta, H., Kovaci, M., *The Turbo-codes Performances in the (Radio) Rice Flat Fading Channels*, Military Technical Academy Bucharest, 31<sup>st</sup> internationally attended conference "Modern Technologies in the XXI Century", 3-4 November, 2005, 6 pages, in print
- Balta, H., Kovaci, M., De Baynast, A., *Performance of Turbo-Codes on Nakagami Flat Fading (Radio) Transmission Channels*, 39<sup>th</sup> Annual Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, California, October 30 - November 2, 2005, 5 pages, in print
- Balta, H., Kovaci, M., Naforniță, M., *A Study on Turbo Coding Systems with  $\pi/4$  Shifted DQPSK Modulation*, Proceedings of the International Symposium SCS, ISSCS'2005, Iasi, July 14-15, 2005, ISBN 0-7803-9029-6, pp. 367-370
- Balta, H., Kovaci, M., *A Study on Non-Binary Turbo Codes*, 36<sup>th</sup> International Scientific Symposium of the Military Equipment & Technologies Research Agency, Bucharest, May 26-27, 2005, ISBN 973-0-03923-2, pp. 214-219
- Balta, H., Miloș, A., Rășinar, M., *Rayleigh and Rice Radio Fading Channels Simulation*, Bulletin of the University Petrol-Gaze, Ploiesti,

- Vol. LVII, Technical Series - Electrotehnics, Electronics, Nr. 2/2005, ISSN 1221-9731, pp.51-56
8. Balta, H., Polvereau, I., Gheorghiuță, I., *Convolutional Codes Performances in Turbo Configuration*, Bulletin of the University Petrol-Gaze, Ploiesti, Vol. LVII, Technical Series - Electrotehnics, Electronics, Nr. 2/2005, ISSN 1221-9371, pp.57-62
  9. Balta, H., Trifina, L., Rusinaru, A., *The Effect of Puncturing on the Convolutional Turbo-Codes Performance*, 36<sup>th</sup> International Scientific Symposium of the Military Equipment & Technologies Research Agency, Bucharest, May 26-27, 2005, ISBN 973-0-03923-2, pp. 288-293
  10. Trifina, L., Balta, H., Rusinaru, A., *Decreasing of the Turbo MAP Decoding Time Using an Iterations Stopping Criterion*, Proceedings of International Symposium SCS, ISSCS'2005, Iasi, July, 14-15, 2005, ISBN 0-7803-9029-6, pp. 371-374
  11. Botoca, C., Budura, G., Miclău, N., *A new competitive learning algorithm for data clustering*, Proceedings ICMCS 2005, Chisinau, Moldavia, ISBN 9975-66-039-8 , pp. 75-78
  12. Botoca, C., Budura, G., Miclău, N., *Radial Basis Function equalization using competitive learning*, Revue Roumaine des Sciences Techniques, Serie Electrotechnique et Energetique, Tome 50, Vol. 4, 2005, ISSN 0035-4066, pp. 451-464
  13. Budura, G., Botoca, C., *La construction d'un modele nonlineaire a l'aide de series Volterra et Wiener*, Revue Roumaine des Sciences Techniques, serie Electrotechnique et Energetique, Tome 50, Vol. 4, 2005, ISSN 0035-4066, pp. 465-475
  14. Budura, G., Botoca, C., *Nonlinearities Identification using The LMS Volterra Filter*, Special Session on Intelligent Systems & Adaptive Control, WSEAS International Conference on Dynamical Systems and Control, Venice, Italy, November 2-4, 2005, ISBN 960-8457—37-8, pp. 148-153
  15. Budura, G., *Nonlinear Systems Identification using the Volterra Model*, International Symposium on Systems Theory, SINTES 12, Vol. 1, Craiova, Romania, 2005, ISBN 973-742-148-5, pp. 25-30.
  16. Câmpeanu, A., Gal, J., *Design of Active Filters Simulating Mesh Current Equation of LC Ladder Filters*, Proceedings of International Symposium on Signals, Circuits and Systems, ISSCS, July 2005, Iași, Romania, ISBN 0-7803-9029-6, pp. 335-338.
  17. Câmpeanu, D., Câmpeanu, A., *PEAQ – An Objective Method To Assess The Perceptual Quality of Audio Compressed Files*, Proceedings of International Symposium on System Theory, SINTES, October 12, 2005, Craiova, Romania, ISBN 973-742-148-5, pp. 487-492.
  18. Borda, M., Naforniță, I., Isar, D., Isar, A., *New instantaneous frequency estimation method based on image processing techniques*, Journal of Electronic Imaging, April-June 2005, volume 14, Issue 2, ISSN 1017-9909, pp. 023013-1-11.
  19. Fablet, R., Augustin, J.M., Isar, A., *Speckle denoising using a variational multi-wavelet approach*, Proceedings of IEEE International Conference Oceans'05, Brest, France, June 20-23, 2005, on CD-ROM, ISBN 0-7803-9104-7, pp. 325-331.
  20. Isar, A., Isar, D., *Le débruitage des images par filtrages dans le domaine de la transformee en ondelette discrete a diversite enrichie*, Revue Roumaine des Sciences Techniques, Serie Electrotechnique et Energetique, Tom 50, Vol. 1, 2005, ISSN 0035-4066, pp. 81-92
  21. Isar, A, Moga, S., Lurton, X., *A Statistical Analysis of the 2D Discrete Wavelet Transform*, Proceedings of International Conference AMSDA 2005, May 17-20, 2005, Brest, France, ISBN 2-908849-15-1, pp. 1275-1281
  22. Isar, A., Moga, S., Augustin, J.M., Lurton, X., *Multi-scale MAP Despeckling of SONAR Images*, Proceedings of IEEE International Conference Oceans'05, Brest, France, June 20-23, 2005, on CD-ROM, ISBN 0-7803-9029-6, pp.325-331.
  23. Isar, A., Moga, S., *A New Method for Denoising SONAR Images*, Proceedings of IEEE International Symposium SCS'05, Iasi, Romania, July 14-15, 2005, ISBN 0-7803-9029-6, pp. 469-472.
  24. Isar, A., Moga, S., *Le débruitage des images SONAR en utilisant la transformee en ondelettes a diversite enrichie*, Rapport de recherche LUSSE-TR-2004-5-FR, ENST-Bretagne, Brest, France, on CD-ROM, 108 pages.
  25. Kovaci, M., Balta, H., Naforniță, M., *The Performance of Interleavers used in Turbo Codes*, Proceedings of International Symposium SCS, ISSCS'2005, Iasi, Romania, July 14-15, 2005, ISBN 0-7803-9029-6 , pp. 363-366.



26. Kovaci, M., Balta, H., *Non-Binary Turbo Codes Interleavers*, 36<sup>th</sup> International Scientific Symposium of the Military Equipment & Technologies Research Agency, Bucharest, May 26-27, 2005, ISBN 973-0-03923-2, pp. 208-213.
  27. Naforntita, C., Borda, M., *Multiple Embedding in Wavelet Subbands for Robust Image Watermarking*, Proc. of IEEE International Workshop on Spectral Methods and Multirate Signal Processing, SMMSP 2005, 20-22 June, Riga, Latvia, ISBN 952-15-1366-7, pp. 135-140
  28. Naforntita, C., *Improved Detection for Robust Image Watermarking*, Proc. of the IEEE Int. Symposium on Signal, Circuits and Systems, ISSCS'05, Iasi, Romania, July 14-15, 2005, vol. 2, ISBN 0-7803-9029-6, pp. 473-476
  29. Naforntita, C., Isar, A., Borda, M., *Image Watermarking Based on the Discrete Wavelet Transform Statistical Characteristics*, Proc. of IEEE EUROCON 2005, International Conference on "Computer as a tool", November 21-24, 2005, Belgrade, Serbia & Montenegro, ISBN 86-4766-218-2, pp. 943-946
  30. Popescu, I., Naforntita, I., Constantinou, Ph., *Comparison of Neural Network Models for Path Loss Prediction*, IEEE Int. Conf. Wireless and Mob. Comp., Networking and Comm. (WiMob 2005), Montreal, Canada, Aug. 22-24, 2005, Vol. 1, ISBN 0-7803-9181-0, pp. 44-49
  31. Rothenstein, B., Damian, I., Naforntita, C., *Relativistic Doppler Effect Free of "Plane Wave" and "Very High" Frequency Assumptions*, APEIRON studies in infinite nature, on-line journal, ISSN 0843-6061, 2005, pp. 122-135.
  32. Rothenstein, B., Naforntita, C., *Graphical aids for relativistic optics*, March 1, 2005, <http://arxiv.org/ftp/physics/papers/0503/0503003.pdf>, 13 pages
- Ciprian DAVID, *Contributions on faults detection using image processing techniques*
  - Romulus REIS, *Non-Stationary Signal Description by Non-Parametrical Method*
  - Janos GAL, *Contributions to Kalman Filters Use in Telecommunications*
  - Marius SALAGEAN, *Non-Stationary Signal Description by Non-Parametrical Methods*
  - Florin VANCEA, *Data Protection in Communication Networks*
  - Andy VESA, *Improvement of Digital Radio Systems Detection*
  - Mircea COSER, *Systems Optimization using TRIZ Technique*
  - Teodora PELA, *Traffic Optimization on Metropolitan Area Networks*
  - Adina DABA, *Non-Stationary Signal Description by Non-Parametrical Method*
  - Tiberiu MUNTEAN, *Audio Watermarking*
  - Florin Dumitru CHIS, first year student
2. *Scientific Supervisor: Prof. dr. eng. Miranda NAFORNIȚĂ*  
*PhD students:*
    - Horia BALTA, *Hierarchical coding for spread spectrum transmission systems*
    - Radu LUCACIU, *Optical communication systems with OCDMA*
    - Maria KOVACI, *N-PSK multiresolution modulations in the COFDM hierarchical systems*
    - Caius ULITA, *Equalizers for radio channel modems*
    - Mirela VIOR, *Quality transmission improvement using turbo codes*
    - Sorin POPA, *Synchronization techniques improvement for radio channel transmission systems*
    - Marius OLTEAN, *Radio channel equalization using cyclic prefix*
    - Florin Lucian MORGOS, *Radio channels equalization techniques improvement*
  3. *Scientific Supervisor: Prof. dr. eng. Alexandru ISAR*  
*PhD students:*
    - Ioana ADAM, first year student
    - Mircea BORA, first year student

#### PHD RESEARCH ACTIVITIES

1. *Scientific Supervisor: Prof. dr. eng. Ioan NAFORNIȚĂ*  
*PhD students*
  - Mirela BIANU, *Contributions on adaptive signal processing in telecommunications*
  - Cristian IGNEA, *Contributions on finding and measurement antenna parameters*
  - Adrian FILIPESCU, *Contributions on Digital Filters Optimal Design*

**PHD THESIS SUSTAINED**

Cornel BALINT, *Speech compression for telecommunication applications*, PhD Supervisor: Prof.dr.eng. Miranda NAFORNITA

**PhD ESSAYS PRESENTED**

- Maria KOVACI, *The simulation of the data transmission system and the performance analyze*
- Maria KOVACI, *Communication channels: Gauss, Rice and Rayleigh*
- Horia BALTA, *The performance analyze of the codes used in the spread spectrum transmission systems*
- Horia BALTA, *Turbo codes*

**RESEARCH TEAM**

- Prof.dr.eng. Ioan NAFORNITĂ: *Signals, Circuits and Systems, Adaptive Signal Processing, Time-frequency Representations, Wavelets Theory's Applications, Microwave Techniques, Image processing, Digital watermarking*
- Prof.dr.eng. Miranda NAFORNITĂ: *Theory of Information and Coding, Data Transmission, Signals, Circuits and Systems, Modern Communication Networks*
- Prof.dr.eng. Alexandru ISAR: *Signals, Circuits and Systems, Wavelets Theory's Applications, Time-frequency Representations, Compression, Coding*
- Prof.dr.eng. Andrei CĂMPEANU: *Telecommunication Equipment Technology, Telecommunication Circuits*

- Lect.dr.eng. Corina BOTOCA: *Microwave Techniques, Signals, Circuits and Systems, Neural networks*
- Lect.dr.eng. Georgeta BUDURA: *Signals, Circuits and Systems, Nonlinear Signal Processing, Telecommunication Circuits*
- Lect.dr.eng. Cornel Balint: *Speech coding, Telecommunications network, Digital Switching*
- Assist.eng. Horia BALTĂ: *Optical Transmission and Processing of Information, Statistical Theory of Information Transmission, Theory of Information and Coding*
- Assist.eng. Maria KOVACI: *Statistical Theory of Information Transmission, Theory of Information and Coding, Signals Circuits and Systems*
- Assist.eng. Janos GAL: *Signals, Circuits and Systems, Telecommunication Circuits*
- Assist.eng. Radu LUCACIU: *Optical Transmission and Processing of Information*
- Assist.eng. Nicolae MICLĂU: *Optical Transmission and Processing of Information, Theory of Information and Coding*
- Assist.eng. Corina NAFORNITĂ: *Digital Signal Processing, Digital Watermarking*
- Assist.eng. Marius OLTEANU: *Data Transmission on Radio Channels*
- Assist.eng. Marius SĂLĂGEAN: *Signals, Circuits and Systems*

**CONTACT PERSON**

Prof.dr.eng. Ioan NAFORNITĂ  
 Tel: +40-256-403302  
 E-mail: [ioan.nafornita@etc.upt.ro](mailto:ioan.nafornita@etc.upt.ro)

## RESEARCH GROUP IN IMAGE PROCESSING AND MULTIMEDIA TECHNOLOGIES

**RESEARCH FIELDS**

- Television and Digital Television
- Image Compression
- Digital Image Processing
- Motion Analysis
- Pattern Recognition
- Interactive Multimedia Techniques
- Media Streaming
- Multimedia Databases
- Internet Security Techniques
- E-learning
- Advanced learning technologies

**KEYWORDS**

Image Processing, Sound Processing, Multimedia, Image Compression, Interactive Applications, Web Services, E-learning

**RESEARCH CONTRACTS**

**1. CNCSIS grant No. 27688/14.03.05, CODE 600, type A, Object tracking estimation in video sequences**

Director: Assoc.prof.dr.eng. Florin ALEXA

Value: 11,000 RON

Members: Prof.dr.eng. Corneliu I. TOMA

Prof.dr.eng. Vasile GUI



Lect.dr.eng. Muguras MOCOFAN  
 Lect.eng. Catalin CALEANU  
 Assist.eng. Andy VESA  
 Assist.eng. Ciprian DAVID  
 Assist.eng. Artur MULLER  
 Eng. Codrut IANASI  
 Eng. Andreea GALEANU  
 Stud. Daniela CLIM

**FIELD AND GRANT DESCRIPTION:** In the context of rapid development of multimedia technologies, visual surveillance with traffic estimation and facial recognition represent an important goal for many applications. The objective is to develop a tool for people counting intended to offer statistical knowledge useful in the objective evaluation of the efficiency of the services delivered to clients in fast foods. The system will be able to accurately estimate the number of people passing through different areas and to derive mean, minimum and maximum amount of time for servicing clients at different moments of the day or to average such information on different time intervals. Always, it will be possible to use in automat tracking of mobile robots. The system will operate based on a PC environment in connection with a variable number of webcams in an Ethernet network.

The goal of the work is to develop a system with robust and real-time operation. The system has to cope well with crowded environments. This will be achieved through the following contributions:

- a fast background detection using nonparametric kernel density estimation
- a robust and accurate tracking method for people tracking in crowded environments
- use of a multimodal strategy to improve segmentation and tracking results
- find robust solutions for using deformable models in people counting

Accomplishing the proposed goals enables extension of the application range to several related fields, such as multimedia image sequence compression, video indexing for browsing, road traffic analysis etc.

**2. CNCIS grant No. 32940/2004, CODE 26, type AT, *The Traditions and Culture in the Multiethnic Region of Banat – interactive presentation on CD-ROM and Internet***

*Director:* Lect. dr. eng. Muguras MOCOFAN  
*Value:* 12,000 RON  
*Members:* Assoc.lect.eng. Diana ANDONE  
 Assist.eng. Marian BUCOS  
 Assist.eng. Gabriela GLAVAN  
 Assist.eng. Arthur MULLER

**FIELD AND GRANT DESCRIPTION:** The main goal was to present and to record in digital format the main popular traditions during the year, the image of the multiethnic Banat village, the cultural

pieces produced by some ethnic communities in Banat: Romanians, Hungarians, Germans, Serbs, Croats, Czechs, Jewish, Gypsies.

The CD\_ROM application and the web site encourage multidisciplinary co-operation between the projects realizes (culture people, ethnologists, anthropologies, multimedia developers, graphicicians, specialists in communication and audio-video) as well as between the actors of the project: Banat village inhabitants.

Our multimedia products can be use as support for understanding tolerance and inter-ethnic co-operation for young's (pupils, students), and the broader community through Internet.

During the period 2004-2005, the main traditions of the Banat ethnic groups it was observed and recorded as audio and video. The team of specialists interview people from all these groups in order to understand the significance of these ceremonies for their life. Elements of the multiethnic Banat village are recorded (architecture, costumes, tools). The materials are processed from an anthropologic point of view, by identifying and interpreting the particularities and the interferences between traditions to the different ethnics in Banat. A comparison is made between the obtained results and some old evidences kept by the Archive of the University of West from Timisoara, in order to obtain a historical perspective of the traditions and inter-ethnic relations. We have now a collection with pieces of music, dance, literature, painting realized by Banat's inhabitants.

Target group and beneficiaries:

- Members of the Banat's ethnic communities (in the country and abroad) interested in their own traditions and the influence of other ethnics in their traditions
- Tourists and visitors of Romania
- Students in ethnology, anthropology and journalism
- Ethnologies and anthropologies scientific communities.

**3. CEEEX Project, Contract Nr. CEX 05-D8-77 / 19.10.2005, *Foresight Scenarios for the Romanian Economical Sectors with Inovation Potential in the View of the Year 2020 „INOVFOR”, period 2005-2008, UPT coordinator***

*Director:* Assoc.prof.dr.eng. Marian MOCAN  
*Value 2005:* 50,000 RON  
*Members:* Prof.dr.eng. Radu VASIU  
 Prof.dr.eng. Nicolae ROBU  
 Prof.dr.eng. Marius OTESTEANU  
 Prof.dr.eng. Ivan BOGDANOV  
 Prof.dr.eng. Aldo DE SABATA  
 Assoc.lect.eng. Diana ANDONE  
 Lect.dr.eng. Mugur MOCOFAN  
 Assist.eng. Marian BUCOS  
 Assist.eng. Mihai ONITA

Eng. Marius CONDREA  
 Eng. Iasmina ERMALAI  
*Partners:* I.N.C.S.M.P.S. Bucharest  
 I.P.A. SA Bucharest  
 CURS SA Bucharest  
 INOE Bucharest

**FIELD AND GRANT DESCRIPTION:** The main goal of the project is to elaborate a National Strategy for Research – Development – Innovation, and according to that to develop a R&D National Plan for the period 2007-2013. This plan will be correlated with:

- the general external and security policy objectives, aiming to assess Romania as a power and stability factor in the Black Sea and the Balcans Peninsula area;
- the necessity of European integration, with minimal costs, having in view the strengthening of the Romanian economy in order to face the competition on the new market;
- the strengthening of the functionality of the specific economical mechanisms of an emerging market;
- the creation of the premises to decrease the differences between Romania and the other members of the European Union;
- the move towards an economy based on knowledge;
- the necessity to create the premises for the development of the domestic market, the increase of the work opportunities and of the professional training, the amelioration of the working conditions, of the health and living conditions for the population, the creation of the local brands and trade marks;
- the creation of a scientific and technological stock, concentrated to the areas with good opportunities to make the most from the human capital;
- the design of the institutional system and of the regulations able to allow the sustainability, the development, the use and the efficiency of the scientific and technological capital, as determined;
- the coherent development of the resources and their correlation to the need of scientific and technological capital, for the areas with development potential.

The project objectives are:

- to make an analysis of the strong points, of the weak points, of the effective and potential opportunities, of the effective and potential factors of risk resulting from the economical evolution on long term, medium term and short term
- to develop a strategy and a potential national plan for R & D

- to make proposals able to create the framework and the instruments needed for valorising the existing opportunities, for translating some potential opportunities into effective ones, for minimizing the existing risks and for preventing the identified potential risks
- to elaborate the main scenarios for the Romanian economical and social development until 2020, as a premise for the elaboration of a consolidated foresight endeavour, made up from „critical domains / technologies”
- to elaborate the National Plan for research – development – innovation, that will include the means and ways to encourage and support the critical domains / technologies, the modalities for their effective implementation, the monitoring and evaluation tools, the financing mechanisms and resource allocation principles, the modalities to promote excellence.

Project details can be found at:

[www.opendrum.utt.ro/inofvor](http://www.opendrum.utt.ro/inofvor)

**4. CEE Project, Contract Nr. CEX 05-D8-5/10.10.2005, Development of the Concept of Social Responsibility in the Romanian Companies, in the European Context „RSE & UE”, period 2005-2008, UPT partner**

*Director:* Assoc.prof.dr.eng. Marian MOCAN

*Value 2005:* 60,000 RON

*Members:* Prof.dr.eng. Radu VASIU  
 Assoc.lect.eng. Diana ANDONE  
 Lect.dr.eng. Mugur MOCOFAN  
 Assist.eng. Marian BUCOS  
 Assist.eng. Mihai ONITA  
 Eng. Marius CONDREA  
 Eng. Iasmina ERMALAI

*Coordinator:* I.N.C.S.M.P.S. Bucharest

*Partners:* I.P.A. SA Bucharest  
 CURS SA Bucharest  
 INOE Bucharest

**FIELD AND GRANT DESCRIPTION:** The Lisbon Agenda (2000) establishes as the main strategical objective that „the EU should become the most competitive and dynamic knowledge based economy in the world, capable of sustainable economical growth, with more and better work places and with a bigger social cohesion”. The project represents an effective contribution to the implementation of those desires.

The project objectives are:

- Realization of a report about the existing situation at international level, including in the EU, referring to the concept of social cohesion
- Design of informatic instruments for documentation, communication, collaboration and implementation of some activities
- Elaboration of some empirical analyses regarding the existing situation in Romania,

including the external dimension (Corporate Social Responsibility – CSR)

- Elaboration of a methodology for the investigation of the internal dimension of IRS/CSR in Romania
- Elaboration of a methodology for the investigation of the dimension of IRS/CSR at the level of organisation in Romania
- Evaluation of the dimension of the economical, social and environmental aspects, at the level of organisation, in Romania
- Evaluation of the impact of IRS/CSR towards the competitiveness, occupational quality, inclusion and social cohesion
- Determination of some directions of perspective in applying IRS/CSR in Romania, in European context.

Project details can be found at:

[www.opendrum.utt.ro/rse&ue](http://www.opendrum.utt.ro/rse&ue)

#### **5. Research grant, Rain simulator – general considerations, standards, components simulation**

*Director:* Prof.dr.eng. Marius OTESTEANU

*Value:* 29,000 RON

*Customer:* Siemens VDO Automotive

### INTERNATIONAL PROGRAMMES

#### **6. Leonardo da Vinci II project: Retail Education Mechanism for On-line Training in Europe, (REMOTE)**

*Director:* Prof.dr.eng. Radu VASIU

*Value:* 34,352 EURO

*Members:* Assoc.lect.eng. Diana ANDONE  
Assoc.lect.eng. Daniel HAIUDUC  
Assist.eng. Marian BUCOS  
Assist.eng. Artur MULLER  
Assist.eng. Mihai ONITA  
Eng. Marius CONDREA

*Partners:* Ethos Associates, Nortwich, UK  
Language Service Centre, Giessen, D  
Theta Education & Training Madrid

**FIELD DESCRIPTION:** The project aims to develop a new, accessible web design qualification that can be accessed by a wide range of learners, including those with sensory disabilities, via a content rich CD. Formal assessment, certification and online tutor support are managed via a specially developed REMOTE Learning Hub. The programme will be available in English, Romanian, German and Spanish.

A key objective is removing barriers to learning and certification for disabled users and other encountering difficulties in accessing training or qualifications in basic web design. All aspects of product design, delivery and the learner support mechanisms have been developed in consultation with stakeholders to remove barriers to access.

The new qualification will be accredited in the UK by the NCFE (National Council for Further Education), and will recognize skills in basic, accessible web design to a consistent basic standard across Europe.

Project details can be found at:

[www.remotetraining.org](http://www.remotetraining.org) or

[www.removingbarriers.com](http://www.removingbarriers.com)

#### **7. Socrates Erasmus Curriculum Development project: International On-Line Master in Multimedia (IMM – CD)**

*Director:* Prof.dr.eng. Radu VASIU

*Value:* 40,600 EURO

*Members:* Prof.dr.eng. Nicolae ROBU  
Assoc.lect.eng. Diana ANDONE  
Lect.dr.eng. Mugur MOCOFAN  
Assoc.lect.eng. Daniel HAIUDUC  
Assist.eng. Marian BUCOS  
Assist.eng. Mihai ONITA  
Eng. Marius CONDREA  
Iasmina ERMALAI, PhD student

*Partners:* Univ. of Nice, FR  
JME Associates, UK  
Univ. of Technology, Kaunas, LT  
E-Collegium, Budapest, HU  
Univ. of Godollo, HU  
Mimoza Kft, Budapest, HU  
Univ. of Zvolen, SK

**FIELD DESCRIPTION:** The scope of the project, which is funded by the European Commission for 2 years (Oct. 2004 – Sept. 2006) is to introduce an International on-line Master degree in Multimedia. The consortium of participants established an International Academic Board that is responsible for establishing the curricula and for checking the quality of the courses. Each partner university takes part to the course development, the allocation of courses being done based on competition. Some of the courses might be allocated for development to recognized experts in e-learning from USA, Finland and Greece.

After course development, the degree program will run through e-learning, tutoring being realized on-line by the course developers. The partner universities will ensure local support centres, in order to allow face-to-face meetings for the students they enrolled. Final examination will be done through face-to-face examination done by the course leaders, the only participants to the degree program that will have to travel internationally.

“Politehnica” University of Timisoara is the program coordinator and contractor.

Further details on the project can be found at:

[www.immaster.net](http://www.immaster.net)

### 8. Leonardo da Vinci II project: *Measure to Improve (METOIM)*

*Director:* Prof.dr.eng. Radu VASIU  
*Value:* 51,476 EURO  
*Members:* Assoc.lect.eng. Diana ANDONE  
 Assoc.lect.eng. Daniel HAIDUC  
 Assist.eng. Marian BUCOS  
 Assist.eng. Mihai ONITA  
 Eng. Marius CONDREA  
 Lucia RAZMERITA, journalist  
 Cristian TZECU, PhD student  
*Partners:* IAL Toscana, IT  
 BFI Steiermark Graz, AT  
 M2A Technologies, FR  
 Macedonian Institute of Employment (MAKINE), GR  
 OFA Kht., HU

FIELD DESCRIPTION: The project's main objectives are:

- to sensibelize managers and responsible working in Labour Social Association or Syndicates to improve the quality of, and access to, continuing vocational training and the Lifelong acquisition of skills and competences
- to arise conscience on workers about the importance of vocational activities, but also informal initiatives (i.e. for instance the participation to the so-called "Study Sessions" promoted by small groups of people to enhance their knowledge on a particular topic, participate to "Counselling sessions" whereby testing their competences and their known/unknown needs)
- to implement an innovative ICT tool which can be transferred to different contexts, such as the entrepreneurial one, to measure the communication and information needs/demands
- to experiment the above said tool in a small representative group of "managers" and "workers" and/or "Labour representatives" and "workers"
- to promote equal opportunities, especially at the Social representative level in order to carry out projects to help women to better balance their family with working timetable

Further details on the project can be found at: [www.metoim.org](http://www.metoim.org)

### 9. Leonardo da Vinci II project: *e2Engineering*

*Director:* Prof.dr.eng. Radu VASIU  
*Value:* 20,003 EURO  
*Members:* Assoc.lect.eng. Diana ANDONE  
 Assist.eng. Marian BUCOS  
 Assist. eng. Mihai ONITA  
 Prof.dr.eng. Doina DRAGULESCU  
 Prof.dr.eng. Mirela TOTH-TASCAU  
 Eng. Marius CONDREA

*Partners:* Lucia RAZMERITA, journalist  
 Univ. Godollo, HU  
 Univ. Miskolcz, HU  
 EADTU – European Association of Distance Teaching Universities, NL  
 Univ. of Gdansk, PL  
 Univ. of Kosice, SK  
 Ethos Associates, UK

FIELD DESCRIPTION: The project's aim is to develop IT tools able to facilitate on-line education in technical fields, especially Computer Aided Engineering. Course modules and examples of remarkable technical achievements will be developed and offered on-line using the COEDU e-learning platform. Courses will be developed jointly and will be translated and offered in five languages: English, Hungarian, Romanian, Polish and Slovakian. Pilot courses will be offered free of charge.

### 10. Socrates Minerva project: *"e-Taster – short, free on-line courses – "tasters" – for multilingual, international delivery"*

*Director:* Assoc.lect.eng. Diana ANDONE  
*Value:* 61,314 EURO  
*Members:* Prof.dr.eng. Radu VASIU

Lect.dr.eng. Mugur MOCOFAN  
 Assoc.lect.eng. Daniel HAIDUC  
 Assist.eng. Marian BUCOS  
 Assist.eng. Mihai ONITA  
 Eng. Marius CONDREA  
 Lucia RAZMERITA, journalist  
 Cristian TZECU, PhD student  
 Iasmina ERMALAI, PhD student

*Partners:* Univ. Miskolcz, HU  
 E-Collegium, Budapest, HU  
 Univ. of Godollo, HU  
 Mimoza Kft, Budapest, HU  
 EADTU – European Association of Distance Teaching Universities, NL  
 Univ. of East London, UK  
 Univ. of Gdansk, PL  
 Univ. of Kosice, SK  
 Univ. of Plovdiv, BL

FIELD DESCRIPTION: The project aims to develop a multilingual platform for e-learning course delivery. It also aims to develop short on-line courses, "tasters" for full version content offered commercially.

## PUBLICATIONS

### BOOKS

1. Julia N. Georgi, Athina A. Lazakidou, Marius Ottesteanu, Vincenzo Niola (editors), *Proceedings of 2005 WSEAS Int. Conf. on Dynamical Systems and Control (CONTROL '05)*, Venice, Italy, 2005, 613 pag, CD-ROM, ISBN 960-8457-37-8

2. Alexa Florin, *Sound Techniques*, West Publishing House, Timișoara, 2005, ISBN 973-36-0415-1, 287 pages

#### PAPERS

1. Alexa, F., Gui, V., *Planar motion estimation algorithm for region based coding*, 2005 WSEAS Int. Conf. on Dynamical Systems and Control, Venice, Italy, November 2-4, 2005, ISBN 960-8457-37-8, pp. 457-462
2. Andone, D., Vasiiu, R., Bucos, M., Muller, A., Raicovici, F., *Building Digital Bridges for People with Disabilities*, In *Lifelong E-Learning*, Editors: Andras Szucs, Ingeborg Bo, Published in Helsinki, Finland by EDEN (European Distance and E-Learning Network), June 2005, ISBN 963-218-134-4, pp. 340-345
3. Andone, D., Boyne, C., Dron, J., Pemberton, L., *What Is It to Be a Digital Student in a British University?*, 5<sup>th</sup> IEEE International Conference on Advanced Learning Technologies, ICALT 2005, 5-8 July 2005, Kaohsiung, Taiwan., Editors: P. Goodyear, D. Sampson, D. Yang, Kinshuk, Published by IEEE Computer Society Press, Los Alamitos, CA, ISBN 0-7695-2338-2, pp. 925-928
4. Andone, D., Dron, J., Boyne, C., Pemberton, L., *Digital Students and Their Use of E-learning Environments*, Proceedings of the IADIS International Conference "WWW / INTERNET 2005", Lisbon, Portugal, 19-22 October, 2005, Editors: Pedro Isaias, Miguel Baptista Nunes, ISBN 972-8924-02-X, pp. 302-306
5. Andone, D., Vasiiu, R., *Instant Communication Methods – Development and Analysis*, Proceedings of the EADTU International Conference, Rome, Italy, 10-11 November, 2005, CD-ROM + Internet edition, 6 pages, <http://www.eadtu.nl/proceedings>
6. Ianăși, C., Gui, V., Alexa, F., Toma, C., *Fast and Accurate Background Subtraction for Video Surveillance, Using an Adaptive Mode – Tracking Algorithm*, 2005 WSEAS Int. Conf. on Dynamical Systems and Control, Venice, Italy, November 2-4, 2005, ISBN 960-8457-37-8, pp 391-397
7. Ianăși, C., Toma, C., Gui, Pescaru, D., *Kernel selection for mean shift background tracking in video surveillance*, Proc. 4th Int. Conference on Microelectronics and Computer Science, ICMCS05, Chișinău, September 15-17, 2005, Vol. II, pp. 389-392
8. Ianăși, Gui, C.V., Toma, C., Pescaru, D., *A fast algorithm for background tracking in video surveillance using nonparametric kernel density estimation*, Facta Universitatis, Niš, Serbia & Montenegro, Vol. 18, No.1, 2005, ISSN 0353-3670, pp. 127-144
9. Mihaescu, A., Otesteanu, M., *Model Characterization of Impulse Response for Diffuse Optical Indoor Wireless Channels*, Proceedings of the 2005 WSEAS Int. Conf. on Dynamical Systems and Control (CONTROL '05), Venice, Italy, ISBN 960-8457-37-8, pp. 545-550
10. Otesteanu, M., *Embedded Systems with Adaptive Architecture*, WSEAS Transactions on Electronics, Issue 3, Volume 2, July 2005, ISSN 1109-9445, pp. 100-107
11. Otesteanu, M., Popa, D., *Intelligent Control for Air Cushion Transporters*, WSEAS Transactions on Systems, Issue 12, Volume 4, December 2005, ISSN 1109-2777, pp. 2376-2383
12. Otesteanu, M., *Cercetarea, proiectarea hardware și software, realizarea și testarea unui bloc electronic de comandă inteligentă pentru un sistem de transport pe pernă de aer*, Revista de Politica Științei și Scientometrie, Numar Special dedicat rapoartelor de cercetare, 2005, ISSN 1582-1218, 47 pages
13. Otesteanu, M., *Digital Input / Output Extension Solution for Embedded Systems*, MicroCAD 2005 International Scientific Conference, 2005, Miskolc, Hungary, ISBN 963-661-656-6, pp. 37-42
14. Otesteanu, M., *Expansion Bus for Modular Embedded Systems*, Proceedings of the 7<sup>th</sup> WSEAS Int. Conf. on Automatic Control, Modeling and Simulation (ACMOS '05), 2005, Prague, Czech Republic, ISBN 960-8457-12-2, pp. 401-405
15. Otesteanu, M., Ignea, A., Gontean, A., *Experience of Politehnica University of Timisoara in IT&C Curricula Development, According to Economic Partners Needs*, Université dans la Société (UNISO 2005), Cherbourg, France (proceedings to be published)
16. Otesteanu, M., Popa, D., *Adaptive Steering Control for Self-Guided Air Cushion Transporters*, Proceedings of the 2005 WSEAS Int. Conf. on Dynamical Systems and Control (CONTROL '05), Venice, Italy, ISBN 960-8457-37-8, pp. 451 – 456
17. Pescaru, D., Toma, C., Chirilă, C., Gui, V., Tundrea, E., *Parameter transmission protocol for grid image processing*, Proc. 4th Int. Conference on Microelectronics and Computer Science, ICMCS05, Chișinău, September 15-17, 2005, Vol. II, pp. 79-82



18. Sikora, A., Otesteanu, M., *Power Consumption Models for Wireless Grid Networks with Special Regard of Energy Autonomous Systems*, WSEAS Transactions on Systems, Issue 12, Volume 4, December 2005, ISSN 1109-2777, pp. 2189-2195
  19. Sikora, A., Otesteanu, M., *Power Consumption Models for Wireless Grid Networks*, Proceedings of the 2005 WSEAS Int. Conf. on Dynamical Systems and Control (CONTROL '05), Venice, Italy, ISBN 960-8457-37-8, pp. 162-167
  20. Stan, D., Otesteanu, M., Gontean, A., *Generating Custom Length Programmable Signals*, MicroCAD 2005 International Scientific Conference, 2005, Miskolc, Hungary, ISBN 963-661-656-6, pp. 53-58
  21. VasIU, R., Robu, N., Andone, D., Bucos, M., *Is it eLearning a viable solution in Romania?*, 5<sup>th</sup> IEEE International Conference on Advanced Learning Technologies, ICALT 2005, 5-8 July 2005, Kaohsiung, Taiwan,, Editors: P. Goodyear, D. Sampson, D. Yang, Kinshuk, Published by IEEE Computer Society Press, Los Alamitos, CA, ISBN 0-7695-2338-2, pp. 995-999
  22. VasIU, R., Andone, D., Bucos, M., *Using online questionnaires in learning and training*, Proceedings of the International Conference "Network Entities" NETTIES 2005, St. Polten, Austria, 12-15 October, 2005, 13 pages (in press)
  23. VasIU, R., Andone, D., *Development of multimedia studies curriculum through European co-operation*, Proceedings of the EADTU International Conference, Rome, Italy, 10-11 November, 2005, CD-ROM + Internet edition, <http://www.eadtu.nl/proceedings>, 8 pages
- Artur MULLER, *Contributions in implementing of the multimedia databases, with local and remote access*
  - Codruț N. IANĂȘI, *Contributions at the video surveillance systems development*
  - Daniel C. HAIDUC, *Contributions in the color digital reproduction field*
  - Radu TĂNASE, *Ultrasound electronic systems for the movement evaluation in the fluid environment*
  - Mihai I. ONIȚĂ, *Video communications in multimedia applications*
  - Constantin M. BUCOS, *odeling and analysis of mobile virtual organizations*
  - Mircea TOMOROGA, *Contributions at the conception and design of the analog integrated circuits in CMOS technology*
  - Florin-Josef LĂTĂREȚU (from Germany), *Contributions to the intelligent telecommunication network achievement*
2. *Scientific Supervisor: Prof. dr. eng. Marius OTEȘTEANU*  
*PhD students:*
    - Georgiana SÂRBU DOAGĂ, first year student
    - Sandra RUGINĂ, first year student
  3. *Scientific Supervisor: Prof.dr.eng. Radu VASIU*  
*PhD students:*
    - Iasmina ERMALAI, first year student
    - Artur SRAUM, first year student
    - Cristian TECU, first year student

#### **PhD ESSAYS PRESENTED**

- Codruț Ninu IANĂȘI, *The present and outlook stage in detecting and tracking of the background in video surveillance*
- Radu TĂNASE, *The present and outlook stage in the electronic systems for the movement evaluation*
- Mircea TOMOROGA, *The present and outlook stage in the implementation of the D/A converters in CMOS technology*

#### **PhD RESEARCH ACTIVITIES**

1. *Scientific Supervisor: Prof. dr. eng. Corneliu I. TOMA*  
*PhD students:*
  - Valentin I. MARANESCU, *Contributions at the performance improvement of voltage regulator*
  - Andreea GĂLEANU, *Contributions at the performance improvement of the GSM system*
  - Mirela L. IOANEȘIU, *Contributions at the network security by the using of the virtual private networks (VPN)*

#### **RESEARCH TEAM**

- Prof.dr.eng. Corneliu TOMA: *Television, Analogue Electronics, Image Compression, Motion Analysis, Pattern, Recognition, Multimedia Technologies;*

- Prof.dr.eng. Marius OTEȘTEANU: *Television, Telephone Transmission Systems, Information Recording Techniques*;
- Prof.dr.eng. Vasile GUI: *Image Processing, Electronic Circuits and Devices*;
- Prof.dr.eng. Radu VASIU: *Multimedia, Image Compression, Digital Television, Interactive Multimedia Applications, Web Services, E-learning*;
- Assoc.prof.dr.eng. Florin ALEXA: *Image and Sound Processing*;
- Lect.dr.eng. Mugur MOCOȘAN: *Machine Vision and Pattern Recognition, Multimedia, Studio Equipment, Video Production*;
- Assoc.lect.eng. Diana ANDONE: *Multimedia Applications, E-learning, Adaptive and Adaptable Technology, Media Research*;
- Assoc.lect.eng. Daniel HAIDUC: *Computer Graphics, Animation Techniques*;
- Assist.eng. Adina DABA: *Television, Telephone Transmission Systems, Information Recording Techniques*;
- Assist.eng. Constantin M. BUCOS: *Multimedia Databases, Object Oriented Programming*;
- Assist.eng. Mihai ONITA: *Audio-video Compression, Digital Television, Multimedia Applications*.

#### Contact Person

Prof.dr.eng. Corneliu I. TOMA  
 Department of Communications  
 Bul. Vasile Parvan, nr. 2  
 300223 Timisoara, Romania  
 Tel/fax: +40-256-403300  
 E-Mail: [corneliu.toma@etc.upt.ro](mailto:corneliu.toma@etc.upt.ro)

## RESEARCH GROUP IN RADIO COMMUNICATIONS

#### RESEARCH FIELDS

- Radio communications
- Mobile Radio
- Radio Systems Engineering
- Medical Engineering

#### PUBLISHED PAPERS

1. Simu, C., *A Solution for Short / Long Distance Wireless ECG Telemonitoring*, Proceedings of the "Doctor ETc 2005" Session, Timisoara, September 22, 2005, pp. 10-15
2. Simu, C., *A Bluetooth Solution for Proximal Wireless ECC Telemonitoring*, Proceedings of the "Doctor ETc 2005" Session, Timisoara, September 22, 2005, pp. 16-21

#### PhD THESIS SUSTAINED

Abdul Rahman ABUCHAKER, *Contributions to acquisition, processing and interpretation of biomedical signals by electronic means*, PhD Supervisor: Prof.dr.eng. Anton POLICEC

#### RESEARCH TEAM

- Prof.dr.eng. Anton POLICEC: *Medical Electronics, Radiocommunications*
- Assoc.prof.dr.eng. Eugen MÂRZA: *Mobile Radio, Radio Systems Engineering, Radiocommunications*
- Assist.eng. Călin SIMU: *Medical Electronics, Radio communications*
- Assist.eng. Tiberiu MUNTEAN: *Watermarking, Speech Processing*
- Assist.eng. Andy Vesa: *Radiocommunications, Mobile Radio*

#### Contact Person

Assoc.prof.dr.eng. Eugen MÂRZA  
 Faculty of Electronics and Telecommunications  
 Department of Communications  
 Bul. Vasile Parvan, nr. 2  
 300223 Timisoara, Romania  
 Tel: +40-256-403313  
 E-mail: [eugen.marza@etc.upt.ro](mailto:eugen.marza@etc.upt.ro)

## RESEARCH CENTER IN INSTRUMENTATION, MEASUREMENT AND ELECTROMAGNETIC COMPATIBILITY – I.M.C.E.M.



### Address:

Faculty of Electronics and Telecommunications  
Department of Measurement and Optical  
Electronics  
2, Vasile Pârvan Bd.  
RO-300223 Timișoara,  
Tel: +40-256-403363  
Fax: +40-256-403362  
E-mail: [alimpie.ignea@etc.upt.ro](mailto:alimpie.ignea@etc.upt.ro)  
<http://www.meo.etc.upt.ro/imcem/>

### GENERAL PRESENTATION

The Director of the IMCEM research center is **Prof. dr. eng. Alimpie IGNEA**, PhD advisor.

The center was created in 11 May 2001, in accordance with the CNCSIS certificate nr. 102/CC-C. IMCEM belongs to the Department of Measurement and Optical Electronics, Faculty of Electronics and Telecommunications. For the Electromagnetic Compatibility field, IMCEM is part of the Multi-User Research Base “National Interuniversity Centre for High Voltage Engineering and Electromagnetic Compatibility”.

The main research and development fields are:

- *Electric and Electronic Measurement and Instrumentation*: improving measurement methods, sensors and transducers;
- *Electromagnetic Compatibility*: EMC measurements and tests at high frequencies, electromagnetic supervision;
- Main activities since the creation of the centre:
- IMCEM endowment with high specialized equipment for measurements, tests, and education through a TEMPUS programme, a Multi-User Research Base grant and other sources;

- the achievement of scientific and development research objectives through grants and scientific research contracts, consulting, technical expertise, technical assistance, design; ANTSI, CNCSIS grants were obtained and local collaboration with Siemens VDO Automotive and Solectron exist, to be continued and extended;

- Identification of new partners and research programs.

### Researches in SIGNALS SPECTRAL ANALYSIS AND SYNTHESIS WITH APPLICATIONS IN DIGITAL MEASURING SYSTEMS

#### KEYWORDS

Data acquisition, spectral estimation, neural networks, digital synthesized AC calibrators

#### FIELD DESCRIPTION

Digital measuring systems standardization is one of the basic operations in measuring techniques. The standardization problem is more difficult when a higher resolution measuring device is used. Consequently, digital processed signals for standardization are frequently used. Their spectral content is revealed through spectral analysis.

### RESEARCH TEAM

- Prof.dr.eng. Eugen POP: *General Theory of Measurement, Digital Processing of Signals in Measuring Instruments*
- Prof.dr.eng. Liviu TOMA: *Data Acquisition Systems. Microprocessor System Architecture, Digital Processing Structures*
- Prof.dr.eng. Traian JURCA: *Electronic Measuring Instruments. Structural Components of Precision Instrumentation, Programmable Measuring Systems*
- Prof.dr.eng. Dan STOICIU: *Electronic Measuring Instruments, Metrology, Quality and Maintenance, Measuring in Industrial Processes*
- Prof.dr.eng. Aldo De SABATA: *Adaptive Methods in Measurements, Signal Processing*
- Lect.dr.eng. Septimiu MISCHIE: *Electronic and Electric Measuring, Programmable Measuring Systems, Structural Components of Precision Instrumentation*
- Assist.dr.eng. Robert PASZITKA: *Microprocessor System Architecture, Data Acquisition Systems*



### Researches in *ELECTROMAGNETIC COMPATIBILITY*

#### KEYWORDS

Electromagnetic compatibility, EMC directives, immunity to electromagnetic interferences, conducted and radiated emissions, shielding, grounding, site surveys

#### FIELD DESCRIPTION

Main research-development directions: improving measurement methods, sensors and transducers, EMC measurements and tests at high frequencies, electromagnetic supervision.

#### ACTIVITIES AND RESULTS

The research in this field provides means and equipments for EMC and educational improvement in EMC design. It is intended to minimize conducted and radiated emissions and to suppress electromagnetic interferences, performing the tests and verification concerned with the electric, electronic and radio equipments in accordance to EMC directives.

The main contracts of the research group are:

#### **CNCSIS grant No.32940/22.06.2004, Theme No. 14, Code 173, *Electromagnetic monitoring in Spitalul Clinic Judetean No.1 Timisoara***

*Director:* Prof.dr.eng. Alimpie IGNEA

*Value:* 17,319 RON

*Members:* Prof.dr.eng. Traian JURCA  
 Prof.dr.eng. Aldo DE SABATA  
 Prof.dr.eng. Mircea CHIVU  
 Assoc.prof.dr.eng. Mihaela LASCU  
 Assoc.prof.dr.eng. Eugen MARZA  
 Assist.eng. Ciprian DUGHIR  
 Assist.eng. Adrian MIHAIUTI  
 Assist.eng. Cora IFTODE  
 Assist.eng. Liliana STOICA

#### FIELD AND GRANT DESCRIPTION

Considering the increase of electromagnetic pollution, electromagnetic monitoring becomes very important at locations with a specific destination, especially the ones that include life protection. Spitalul Clinic Judetean nr.1 of Timisoara (Department Hospital) is a high-class unit, with modern equipment, which performs a wide range of surgical interventions. From the point of view of electromagnetic compatibility, the hospital is a large electric power consumer, built in a place with high electromagnetic perturbations (radio and TV emitting antennas, tramway and trolleybus lines, big enterprises around, mobile communication networks, its own electric and electronic equipment, etc). The electromagnetic monitoring in the hospital is recommended because: it allows identification of the quiet zones, the ones with major risk level and the means to reduce that level, the placement of some equipments, etc. Monitoring assumes identification of perturbation

sources, followed by measurements of perturbations level. Measurements are done daily, weekly or for a long term, correlated with other events (tramways passing by, lightings, etc). The conducted perturbations will be supervised in the electrical supply network and other networks. The monitoring of radiated perturbations concerns RF emissions, and the hospital's perturbing sources (the existing ISM equipments). Determining the correlation between perturbations, their sources and the transmission means allow for the reduction of their level. The information we get during the monitoring process will be arranged into a map of perturbations distribution according to their characteristics: continuous or intermittent behaviour, level, frequency range, etc. During measurements we will use the telemetry on INTERNET.

#### ACTIVITIES AND RESULTS :

- Data recording and choice of monitoring methods
- Identification of sources for disturbances, monitoring points establishment and elaboration of monitoring methods concerning the disturbances types
- Perturbations level measurement
- Low frequency magnetic field induction measurement
- External sources radiated high frequency perturbations measurement.
- Continuous magnetic field induction measurement
- Design and realization of data acquisition systems for monitoring the transmission of conducted perturbations

#### **PNCDI-INFRA Program nr. 247 / 2004 *Interlaboratory tests for uncertainty measurements evaluation in electromagnetic compatibility***

*Director:* Prof.dr.eng. Alimpie IGNEA

*Value:* 23,500 RON

*Members:* Prof.dr.eng. Traian JURCA  
 Prof.dr.eng. Aldo DE SABATA  
 Assist.eng. Adrian MIHAIUTI  
 Assist.eng. Cora IFTODE

#### FIELD DESCRIPTION

- Study concerning the testing methodology on perturbations receivers used for measuring electromagnetic interferences in the electromagnetic compatibility settled domain;
- Elaborating the interlaboratory comparison size scheme in Round Robin system (circular test);
- Design and realization of verifying systems concerning the perturbations receivers and preparing the testing procedures;
- Design and realization of unit source for mobile perturbations;

- Interlaboratory attempts with perturbations receivers for each partner;
- Processing and evaluation of interlaboratory measurements results.

#### ACTIVITIES AND RESULTS:

The **first phase** was ended on 31 March 2005 financed with 3,500 RON through a study concerning the electromagnetic perturbations sources used in CEM which is part of the research report concerning all the participants to the INFRAS contract.

The **second phase** was financed with 20,000 RON. An experimental model for a *comb* generator was realized and presented at the Conference *Doctor ETC*; this paper will be also published in the Politehnica University scientifique bulletin.

#### *Work-shop organisation*

#### **a) Harmonisation of the Romanian Regulations with European directives in the following domains: Low Voltage, Electromagnetic Compatibility, Radio and Telecommunications equipment, Auto equipment**

Date and place: Petroșani, 2 June 2005

Pitești, 12 October 2005

The following papers were presented:

- European Directive 89/336/EEC on Electromagnetic Compatibility (Eng. Lucian URSEA – General Politics Industrial Direction Counselor, Ministry of Education and Research)
- European Directive 99/5/EEC R & TTE (Eng. Radu ENESCU - IGC București)
- European Directive 95/54/EEC – Automotive (Prof.dr.eng. Andrei MARINESCU; Scientific Vice Director - ICMET Craiova)
- Electromagnetic Compatibility – a Fashion or a Must? (Prof.dr.eng. Alimpie IGNEA - „Politehnica” University of Timișoara)

#### **b) Electromagnetic compatibility aspects in medicine**

Date: 9 November 2005

Place: "Politehnica" University of Timișoara

Organisers: - "Politehnica" University of Timișoara  
- Spitalul Clinic Județean (Department Hospital) no.1 of Timișoara

- General inspectorate for communications and information technology Timișoara

Workshop program:

1. *Fundamental notions in electromagnetic compatibility, Prof. dr. eng. Alimpie IGNEA.*
2. *Measurements methods for electromagnetic field influence upon living organisms, Assoc. prof. dr. eng. Mihaela LASCU, Assist. eng. Cora IFTODE.*
3. *Perturbations monitoring of electrical energy power supply, Assist. eng. Ciprian DUGHIR.*

#### RESEARCH TEAM

- Prof.dr.eng. Alimpie IGNEA: *Electronic and Electric Measurements, Measuring in Industrial Processes, Measuring Systems in Electromagnetic Compatibility, Electromagnetic Supervising of sites, Antennas calibration, Nonlinearities study of high frequency devices*
- Prof.dr.eng. Mircea CHIVU: *Electronic and Electric Measurements, Measuring of the Electrical and Non Electrical Quantities, Television Channels Broadcasted Via Satellite*
- Prof.dr.eng. Aldo De SABATA: *Microwave and Optoelectronics Measurements, Antennas calibration*
- Assoc.prof.dr.eng. Mihaela LASCU: *Measuring of the Electrical and Not Electrical Quantities, Electrical Measuring of the Non Electrical Quantities, Measuring in Industrial Processes, Virtual Instrumentation*
- Lect.dr.eng. Daniel BELEGA: *Measuring Systems in Electromagnetic Compatibility, Instruments for Measurements, Digital Processing Structures*
- Assist.eng. Ciprian DUGHIR: *Electromagnetic Supervision of Sites, Antennas calibration*

#### Researches in SENSORS AND TRANSDUCERS

##### KEYWORDS

Piezoelectric sensors, optical crystals, optical effects, piezoelectric crystals, bulk waves, surface waves, sensor arrays

##### FIELD DESCRIPTION

Optoelectrical and piezoelectric crystals are frequently used in technique. Due to their property of converting optical and mechanical signals, these materials fit for transducers construction.

Theoretical and experimental approaches were made on current measuring and magneto optic and piezoelectric sensors. An I<sup>2</sup>C interface has been experimented.

#### RESEARCH TEAM

- Prof.dr.eng. Sever CRIȘAN: *Optical Electronics, Electrical Measurement, Sensors and Transducers*
- Assist.eng. Emil LUZAN: *Measuring of Environmental Factors, Measuring of the Electrical and Non Electrical Quantities*
- Lect.dr.eng. Adrian VÂRTOSU: *Microwaves, Microwaves and Optoelectronics Measurement, Television Channels Broadcasted Via Satellite.*

**INTERNATIONAL PROGRAMMES****COST 289 Spectrum and Power Efficient Broadband Communications**

Prof. Aldo DE SABATA is delegate 2 for Romania, representative of the "Politehnica" University of Timișoara.

**PHD RESEARCH ACTIVITIES**

1. *Scientific Supervisor: Prof.dr.eng. Eugen POP*

*PhD students:*

- Liliana STOICA: *Contributions to Digital Signal Processing*

2. *Scientific Supervisor: Prof. dr. eng. Sever CRIȘAN*

*PhD students:*

- Octavian LUCA: *Spectral analysis of bioelectrical signals*
- Ovidiu VETREȘ: *Perturbations study of low frequency electromagnetic fields*

3. *Scientific Supervisor: Prof.dr.eng. Alimpie IGNEA*

*PhD students:*

- Ciprian DUGHIR: *Contributions to antennas calibration*
- Cristina VĂLIU: *Contributions to the nonlinearities study of high-frequency circuits*
- Cora IFTODE: *Electromagnetic field effects on living organism*
- Gabriel GĂȘPĂRESC: *Perturbation monitoring in electrical networks*
- Adrian MIHĂIUȚ: *Contributions in antennas calibration*
- Doru Lucian COCOȘ, *Neural Networks and Fuzzy Logic applications to electronic meter calibration*
- Andrei Atila KUBIK, *Automatic testing for dedicated electronic systems*
- Mihai TELESCU, *Contributions to wave propagation modelling*
- Teodor PETRIȚA, *Contributions to radiofrequency disturbances monitoring.*

**PHD THESIS SUSTAINED**

1. Liviu TOMA: *Optoelectronic methods for distance measurements*, Scientific supervisor: Prof.dr.eng. Alimpie IGNEA
2. Petru Lucian SERAFIN, *Contributions to telecommunication lines and terminals testing*,

Scientific supervisor: Prof.dr.eng. Alimpie IGNEA

**PhD ESSAYS PRESENTED**

1. Cora IFTODE, *Techniques used in measuring the influence of electromagnetic fields on living bodies*, November 2005
2. Liliana STOICA, *Actual limits for signal microprocessors*
3. Gabriel GASPARESC, *Data Acquisition System for Disturbances Monitoring from Electric Power Supply Network*
4. Gabriel VASIU, *Parametrical Methods for Line Spectrum Estimation*

**PUBLICATIONS****BOOKS**

1. Belega, D., *Electrical and Electronic Measurements*, Politehnica Publishing House, ISBN 973-625-242-2, 205 pages (published in Romanian)
2. Toma, L., VasIU, G., Pazsitka, R., *Digital Signal Processing Systems*, West Publishing House, Timișoara, 2005, ISBN 973-36-0400-3, 243 pages (published in Romanian)

**PAPERS**

1. Belega, D., Stoiciu, D., *Quality Assessment of a Square Wave as a Function of Levels Accuracy*, Proceedings of the 14<sup>th</sup> IMEKO Symposium on New Technologies in Measurement and Instrumentation and 10<sup>th</sup> Workshop on ADC Modelling and Testing, vol. I, Gdynia/Jurata-Poland, September 12-15, 2005, ISBN 83-89796-37-0, pp. 254-257
2. D. Belega, D. Dallet, "A/D Converters Testing Based on Beat Frequency Method", Proceedings of the Third IEEE Workshop on Intelligent Data Acquisition and Advanced Computing Systems: Technology and Applications, pp. 13-17, ISBN 0-7803-9446-1, Sofia, Bulgaria, September 5-7, 2005.
3. D. Belega, "Characteristics of the Insertion Loss of Some EMI Filters", *Revue Roumaine des Sciences Techniques. Serie Electrotechnique et Energetique*, no.1, pag. 67-80, ISSN 0035-4066, 2005.
4. D. Belega, "The Maximum Sidelobe Decay Windows", *Revue Roumaine des Sciences Techniques. Serie Electrotechnique et Energetique*, no. 3, pag. 349-356, ISSN 0035-4066, 2005.
5. De Sabata, A., *Sampling Theorem for Multidimensional, Multiband Signals*, WSEAS

- Transactions on Signal Processing, Issue 3, Vol. 1, Dec. 2005, ISSN 1790-5022, pp. 458-461
6. De Sabata, I., De Sabata, A., *Thermodynamic Derivation of the Expressions of Force and Energy in the Maxwell-Hertz Theory*, Scientific Bulletin of the "Politehnica" University of Timisoara, Proc. of the Sixth International Power Systems Conference, Nov. 2-4, 2005, Timisoara, in Trans. on Power Engineering, Tom 50(64), Fasc. 1-2, 2005, ISSN 1582-7194, pp. 185-194
  7. Dughir, C., *Detecting Symmetrical Disturbances in the Electrical Power Systems*, in Proc. of the Scientific Communications Session "Doctor ETc 2005", Timișoara, Sept. 22, 2005, pp. 26-29
  8. Dughir, C., *Perturbations monitoring of electrical energy power supply*, in *Electromagnetic compatibility aspects in medicine*, Waldpress Publishing House, Timișoara, 2005, ISBN 973-8453-65-8, pp. 61-70.
  9. Gășpăresc, G., *Wavelet Analysis for Transient Perturbations biexponential impulse and damped sinus*, Proc. of the Scientific Communications Session "Doctor ETc 2005", Timișoara, Sept. 22, 2005, pp. 30-33
  10. Ignea, A., *Fundamental notions in electromagnetic compatibility*, in *Electromagnetic compatibility aspects in medicine*, Waldpress Publishing House, Timișoara, 2005, ISBN 973-8453-65-8, pp. 5-33.
  11. Lascu, M., Ifode, C., *Measurements methods for electromagnetic field influence upon living organisms*, in *Electromagnetic compatibility aspects in medicine*, Waldpress Publishing House, Timișoara, 2005, ISBN 973-8453-65-8, pp. 34-60.
  12. Lascu, M., Lascu, D., *Numerical Methods for Bioelectrical Field Problems*, Proceedings of the 8<sup>th</sup> International Conference on Engineering of Modern Electric Systems, EMES 05, May 26-28, 2005, Oradea, ISSN 1454-9239, pp. 94-99
  13. Lascu, M., Lascu, D., *Feature Extraction In Digital Mammography Using Labview*, Proc. of the WSEAS International Conference on Dynamical Systems and Control (Control '05), Venice, Italy, No. 2-4, 2005, pp. 427-432
  14. Mischie, S., *Simulation and Implementation of an AC Bridge for Impedance Measurement Using Simulink software package*, Proceedings of International Conference Applied Electronics 2005, Pilsen, Czech Republic, September 7-8, 2005, ISBN 80-7043-369-8 pp. 239-244
  15. Mischie, S., *A New Model of a Lead acid Battery*, Proceedings of 13<sup>th</sup> International Symposium on Power Electronics, Ee 2005, Novi Sad, Serbia & Montenegro, November 2-4, 2005, pp.57 in Book of Abstracts, and full paper in Proceedings CD-ROM, ISBN 86-85211-54-9, 6 pages.
  16. Pazsitka, R., *Sampling of periodic and quasiperiodic signals*, Proc. of the Scientific Communications Session "Doctor ETc 2005", Timișoara, Sept. 22, 2005, pp. 30-33
  17. Petrița, T., Mihăiui, A., *Comb Generator for Measurement Receiver Test*, Proc. of the Scientific Communications Session "Doctor ETc 2005", Timișoara, Sept. 22, 2005, pp. 40-45
  18. Petrița, T., Mihăiui, A., *Comb Generator for Measurement Receiver Test*, Scientific Bulletin of the "Politehnica" University of Timisoara, Trans. Electronics and Telecommunications, Tom 48(62), fasc. 1, 2005, ISSN 1583-3380 pp. 26-29.