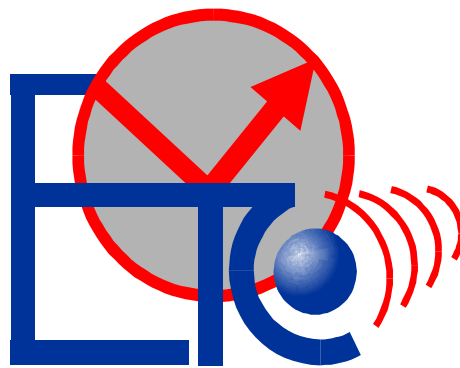


FACULTY OF ELECTRONICS AND TELECOMMUNICATIONS ENGINEERING



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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 approved by CNCISIS. The Center was created in 11.05.2001, in accordance with the CNCISIS 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

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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*

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*

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.

Researches in *NEURAL COMPUTING AND INTELLIGENT SENSORS*

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

Fields of Interests:

- 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)

Hardware/Software resources:

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

Research activities in *POWER ELECTRONICS*

The research team in the power electronics field consists of prof. dr. eng. Viorel POPESCU – head of the group, prof. dr. eng. Tiberiu MURESAN, assoc. prof. dr. eng. Dan LASCU, lecturer dr. eng. Dan NEGOITESCU, lecturer eng. Mircea BABAITA, lecturer dr. eng. Adrian POPOVICI and it will be completed with new members.

Among the research themes investigated by the team, could be mentioned the following:

- Research regarding the 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.

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

CNCSIS Grant No 32940/2004, theme 2, code 20, AT type – Mobile Autonomous Robots Navigation Based on Symbolic Environment Representation

Value: 64,673,000 ROL

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

Members: Assistant eng. Valentin MARANESCU

Student Radu CACIORA

Student Adrian HAREA

FIELD DESCRIPTION:

The work is concerned with problems related to an autonomous mobile robot navigation, evolving in an indoor structured but a priori unknown environment, e.g. inside of an apartment. The purpose of the robot is assisting a human being, for example a physically handicapped person. The project was developed within the framework of cooperation, in the area of Symbolic Representation of an Indoor Environment, between University POLITEHNICA Timisoara, ROMANIA and University Evry Val-d Essonne, FRANCE and it is based on the existing infrastructure of the Complex Systems Laboratories/Univ. Evry. Here a specific architecture called ARMAGRA (Architecture Réseau Multi Agents pour un Groupe de Robots Autonomes) has been implemented. We implement a symbolic representation of the indoor environment. Based on this qualitative description of the environment extracted by the navigation systems, the robot will be able, for example, to retrieve the return path.

ACTIVITIES AND RESULTS:

Mainly the following topics were envisaged by this project:

- frescoes representation/coding based on landmark language; the problem consist of organizing the extracted landmark into a fresco maximizing the information within it;
- frescoes validation/construction; the acquired frescoes could contain doubtful landmarks so a mechanism to qualify them as pertinent was implemented.
- frescoes mechanism of selection; the robots performs a fresco acquisition in few seconds. Obviously not all of them should be kept. So there is the problem of selecting the meaningful frescoes for a complete description of the indoor environment.
- frescoes based algorithms for homing; implementing an frescoes based algorithm for retrieving the return path form the symbolic representation of the environment.

On overall, approximately 1000 lines of code were written during the development of this project.

CNCSIS Grant No 32940/22.06.2004, theme 16, code 30, A type – Theoretical and experimental research for the improvement of ultrasonic investigations through implemented algorithms in dedicated integrated circuits. Dedicated integrated circuits structures for ultrasonic investigations optimization

Value: 130,000,000 ROL
Director: Prof. dr. eng. Mihail TĂNASE
Members: Prof. dr. eng. Corneliu Ioan TOMA
 Assoc. prof.dr.eng. Aurel GONTEAN
 Assist. eng. Ioan LIE
 Assist. eng Bogdan MARINCA
 Techn. Ivan CIORTUȘ

FIELD DESCRIPTION:

Research problems improvement by research objectives were systematically approached. An optimised algorithm was proposed, the median point one; it used the iterative on-chip procedure and VHDL simulation for optimal structures in FPGA

ACTIVITIES AND RESULTS:

➤ There were finalized dedicated integrated circuits structures for implementation of "median point" algorithm of the optimization of an equation derived from focalisation geometry of the investigation ultrasonic ray.
 ➤ An FPGA from the FLEX10/-EPF10K20 family, provided by ALTERA Company and a digital integrated circuits was realised, a digital sampled generator for ultrasonic rays generators delay totalised type.

CNCSIS Grant No 32940/22.06.2004, theme 13, code 175, A type – Pollution Free Electrical Energy Converters Using Soft-Switching Techniques

Value: 70,000,000 ROL
Director: Assoc. prof. dr. eng. Dan LASCU
Members: Prof. dr. eng Tiberiu MUREȘAN
 Prof. dr. eng. Viorel Popescu
 Lecturer eng. Adrian POPOVICI
 Lecturer eng. Dan NEGOIȚESCU
 Assistant. eng. Mircea BĂBĂIȚĂ
 Eng. Alin PARASCHIV
 Eng. Ovidiu VĂTAFU

FIELD DESCRIPTION:

The purpose of the present 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 improvement will be an important demand for the integration of Romania in the European energy system.

ACTIVITIES AND RESULTS:

➤ A family of soft switching PFC converters employing DCVM operation is proposed. It is proved that a BoSBB converter operated in critical mode can perform the task of a PFC circuit with the same stresses as those of a classical BUCK-BOOST converter.
 ➤ A strategy and an algorithm for designing the EMI input filters are given.
 ➤ A unified study of PFC operation for the QRC and QSW basic converters is given. A new BOOST ZVS topology that can be used as ballast in fluorescent lamps is introduced, together with an asymmetric ZVS bridge topology with direct energy transfer.
 ➤ For a new active-clamped ZVS SEPIC topology a small-signal model was developed and controller design using the K factor method was performed.
 ➤ MATLAB design programs and CASPOC library blocks for simulation were also developed.

CNCSIS Grant No 32940/22.06.2004, theme 13, code 175, A type – "Modern methods for high efficiency electrical energy processing using matrix converters"

Value: 80,000,000 ROL
Director: Prof. dr. eng. Viorel POPESCU
Members: Prof. dr. eng Tiberiu MUREȘAN
 Assoc. prof. dr. Dan LASCU
 Lecturer eng. Adrian POPOVICI
 Lecturer eng. Dan NEGOIȚESCU
 Assistant. 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:

- Generalized theory for matrix converters,
- Software simulator for matrix converter.

Contract No 190 /13.12.2004 with ETA2U Industrial Automation – "Enhancement of the signal to noise ratio in serial communication networks"

Value: 20,000,000 ROL

Director: Assoc. prof. dr. eng. Dorina ISAR

FIELD DESCRIPTION: The purpose of this research is to provide a method for signal to noise enhancement for industrial process communications. To accomplish this task we will study signals corrupted by additive spikes that appears on the serial communications networks like RS-485, RS-422, and CAN. We intend to perform a filtering into the wavelets domain and to compare the results obtained with the results of other SNR enhancement methods, on the basis of the bit error rate criteria.

ACTIVITIES AND RESULTS:

- Study of different signals corrupted by additive noise (white Gaussian noise, impulsive noise).
- Enhancement of the SNR, especially in the worst case when we have a minimal value for the initial SNR.
- Software dedicated to this denoising method.

Contract No 78 /01.06.2004 with Solectron Romania – "Hardware and software testing techniques for medical equipment"

Value: 102,600,000 ROL

Director: Prof. dr. eng. Viorel POPESCU

Members: Prof. dr. eng. Virgil TIPONUȚ
Assoc. prof. dr. eng. Dan LASCU
Lecturer dr. eng. Dan NEGOIȚESCU
Assoc. prof. dr. Mihaela LASCU
Assistant eng. Aurel FILIP

FIELD DESCRIPTION: Design and realization of test boards for debugging medical electronic equipment under LabVIEW environment.

ACTIVITIES AND RESULTS:

- Software programs for debugging medical equipment under LabVIEW.
- Acquisition boards dedicated for testing were built in accordance to the Solectron demands.

PHD RESEARCH ACTIVITIES

1. *Professor dr. eng. Tiberiu MUREȘAN, Scientific Ph.D. advisor in the field of Electronics and Industrial Robots*

Ph.D. students:

➤ Dan Mircea ANDREICIUC: *Analysis methods for position and orientation correction of mobile industrial robots*

➤ Ioan LIE: *Contributions to the optimisation of the methods and equipments for ultrasonic investigation*

➤ Petru PAPAȘIAN: *Optimal control of technological processes using intelligent subsystems*

➤ Sebastian TIPONUȚ: *Researches regarding the implementation of embedded systems using predefined templates*

2. *Prof. dr. eng. Virgil TIPONUȚ, Scientific Ph.D. advisor in the field of Industrial Robots*

Ph.D. students:

➤ Sorin IARCA: *Research Regarding the Developing of a Neural Network Designed for Voice Recognition*

➤ Călin LAR: *Reserch concerning autonomous mobile robot control by sensed data fusion*

➤ Ștefan ONIGA: *Contributions to an artificial arm sensing system elaboration*

➤ Alin BRINDUSESCU: *EKG based cardiac motion generation*

➤ Liviu LUCACIU: *Contributions to biometric systems elaboraton and implementation*

➤ Laviniu TEPELEA: *New assisted movement methods for persons with disabilities in media with obstacles*

➤ Cristian BURSASIU: *Contributions to neural networks design optimization*

➤ Ovidiu TRIPON: *Research concerning optimization of the management system for internal combustion motors using neural networks*

➤ Ciprian GAVRINCEA: *Research concerning a neural network implementation for processing the signals generated by muscular and nervous systems*

➤ Ioan GAVRILUT: *Contributions to autonomous mobile robots navigation using cellular neural networks*

➤ Ionut MIREL: *Digital processing methods for video images*

➤ Alexandru DARIE: *Research concerning robot collectivities.*

3. *Prof. dr. eng. Viorel POPESCU, Scientific Ph.D. advisor in the field of Electronics*

Ph.D. students:

➤ Dan NEGOIȚESCU: *Power Factor Control in DC-DC and DC-AC Converters.*

➤ Mircea BĂBĂIȚĂ: *Reaserches on a.c. –d.c. converteres*

➤ Cornel GLISICI *Contributions concerning improved capabilities of uninterruptible power supplies*

➤ Dan SIMU *Adaptive systems for unconventional technologies*

➤ Marin TOMSE *Contributions to theoretical and experimental study of inductive heating power supplies*

➤ Corina IVAN *Energy parameters optimization in dc-dc converters*

➤ Daniel ALBU *Contributions concerning increased capabilities of switched mode converters with PFC applications*

➤ Cristian VRANCILA *Theoretical and experimental contributions regarding active power filters*

➤ Adrian SCHIOP *Contributions to theoretical and experimental study of power converters with ac motors applications*

➤ Dorin CISMASIU *Power factor control in ac-dc conversion systems*

4. Prof. dr. eng. Mircea CIUGUDEAN, *Scientific Ph.D. advisor in the field of Electronics*

Ph.D. students:

➤ Marllene DĂNEȚI: *Propagation-time estimation algorithms in noise source localizing*

➤ Beniamin DRAGOI: *CMOS integrated high-stability sine oscillator conception and design*

➤ Bogdan MARINCA: *Ultrasonics investigation optimizing by dedicated integrated circuits implementing algorithms*

➤ Aurel FILIP: *Research on CMOS integrated frequency references*

➤ Marin DRAGNEA *High stability intergrated sinusoidal generators*

➤ Radu MIHAESCU *Optimal integrates structures for telecommunication systems*

➤ Valeriu BRATESCU *Contributions concerning clock distribution in VLSI-CMOS circuits*

➤ Iosif MUDRA *Research concerning high speed CMOS synchronous comparators*

5. Prof. dr. eng. Horia CĂRSTEA *Scientific Ph.D. advisor in the field of Electronics*

Ph.D. students:

➤ Dumitru MĂRCELONI, Sorin NIMARĂ, Ovidiu MIȚARIU, Cornelia SALOMIA, Mirel BURLACU,

Corneliu Dan TRIPA, Mircea Daniel RIF, Liviu ION and Mircea Florin MIHĂESCU.

PhD THESIS SUSTAINED

1. Petru DEMIAN, *Optimization testing methods for digital electronic equipment*, Scientific Advisor: Prof. dr. eng. Tiberiu MURESAN.

2. Marius MOISE, *Contributions to handover optimisation in an ATM mobile network*, PhD Advisor Prof. dr. eng. Tiberiu MURESAN

3. Daniel TRIP, *Theoretical and experimental reaserches on resonant converters*, PhD Advisor Prof. dr. eng. Viorel POPESCU

PhD ESSAYS PRESENTED AT THE DEPARTMENT'S SEMINARS

1. Assist. Eng. Marllene DĂNEȚI, *Spectral Estimation Algorithms*

2. Assist. Eng. Marllene DĂNEȚI, *Time Delay Estimation Algorithms*

3. Assist. Eng. Marllene DĂNEȚI, *Noise Source Localization using Signal Processors*

4. Assist. Eng. Ioan LIE, *Comparative study of ultrasonic beamforming techniques*

5. Assist. Eng. Petru PAPAȘIAN, *Comparative study of buses used in technological processes control*

6. Eng. Valeriu BRĂTESCU, *Usual clock-distribution circuits for VLSI*

7. Eng. Iosif MUDRA, *Integrated-circuits design program packages*

8. Eng. Corina IVAN, *State of art on PFC circuits*

9. Eng. Corina IVAN, *Modeling and simulation of energy converters*

10. Eng. Cristian VRÂNCILĂ, *State of art on active power filters*

11. Eng. Mircea BĂBĂIȚĂ, *State of art on a.c. – d.c. converters*

PUBLICATIONS

BOOKS

1. Bogdanov, Ivan, *Computer Control of Electrical Drives*, Orizonturi Universitare Publishing House, Timișoara, 2004, 145 pages, ISBN 973-638-112-9, (published in Romanian).

2. Gontean, Aurel, *PIC16F84A RISC Microcontroller*, Orizonturi Universitare Publishing House, Timișoara, 2004, 231 pages, ISBN 973-638-148-X, (published in Romanian), includes CD ROM.

3. Isar, Dorina, Isar, Alexandru, *Filtres*, Politehnica Publishing House, Timișoara, 2004, 295 pages, ISBN: 973-625-128-4 (published in French).
4. Jurca, Lucian, Ciugudean, Mircea, *Analog Integrated Circuits*, Politehnica Publishing House, Timișoara, 2004, 280 pages, ISBN 973-625-150-0 (published in Romanian).
5. Lascu, DAN, *Active Power Factor Correction Circuits and Techniques*, West Publishing House, Timișoara, 2004, 300 pages, ISBN 973-36-0391-0 (published in Romanian).
6. Popescu, Viorel, *Uninterruptible Power Supplies (UPS)*, West Publishing House, Timișoara, 2004, 160 pages, ISBN 973-36-0398-8 (published in Romanian).
7. Tănase, Mihail, Lie, I., Marinca, B., *Ultrasonic Electronic Systems*, Orizonturi Universitare Publishing House, Timișoara, 2004, 294 pages, ISBN 973-638-141-2 (published in Romanian).

PUBLISHED PAPERS

1. Căleanu, C., Mocofan, M., Maranescu, V., *Benchmarking Feedforward Neural Networks Training Algorithms*, Acta Tehnica Napocensis. Electronics and Telecommunications, Nr. 2, Vol. 45, 2004, pp. 18 - 23.
2. Ciugudean, M., Marchegay, Ph., *Double – Simulation New Quadrature Sine Oscillator – the Electronic Quartz*, Scientific Bulletin of the „Politehnica” University of Timișoara, Romania, Transactions on Electronics and Communications, Tom 49(63), Fasc 1, 2004, pp.142-146.
3. Gontean, A., Oteșteanu, M., Stan, D., *Improved Microcontroller and FPGA Based Signal Generator*, Proceedings of the International Conference on Programmable Devices and Systems, PDS'2004, Cracow, Poland, 17-18 November 2004, pag. 274-277.
4. Gontean, A., Băbăiță, M., Jibleanu, R., *Hardware Simulation and Debugging For Microchip RISC Microcontrollers*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Communications, Tome 49(63), Fasc 1, 2004, pp. 180-183.
5. Gontean, A., *Servo loop improves linear-regulator efficiency*, EDN, Design Ideas, July 2004, p. 90.
6. Ionel, S., Dăneți, M., *Low-Cost Electronic Board Improves Electronics Laboratory Efficiency*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Communications, Tome 49(63), Fasc 2, 2004, pp. 346-347.
7. Isar, D., Isar, Al., *Polynomial Approximation of Signals Corrupted by Noise*, Proceedings of International Conference OPTIM'04, Brasov, May, 20-21, 2004, vol.IV, pp. 153-158.
8. Jurca, L., Maranescu, V., *A New Way to Build a Very Fast Binary Adder*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Communications, Tome 49(63), Fasc 1, 2004, pp. 193-198.
9. Keller, G., Lascu, D., *State-Space Control Structures for Buck Converters with/without Input Filter*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Communications, Tome 49(63), Fasc 1, 2004, pp. 63-68.
10. Lascu, D., Van Duijsen, P., *Discontinuous Capacitor Voltage Mode DC-DC Converters*, European Power Electronics Conference EPE-PEMC 2004, Riga, Letonia, 2004, pp. 232-243.
11. Lascu, D., Keller, G., Viorel Popescu, *A PFC Circuit Based on a Boost Superimposed Buck-Boost Converter*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Communications, Tome 49(63), Fasc 1, 2004, pp. 85-88.
12. Lascu, D., Popescu, V., *A New Sheppard-Taylor Type DC/DC Converter*, RSEE, 2004, 5th International Conference on Renewable Sources and Environmental Electro-Technologies, May, 2004, pp. 95-100.
13. Lascu, D., Lascu, M., *High Frequency EMI Filter Design for Single Phase PFCs and APFs*, 3rd Symposium of Electromagnetic Compatibility SICEM 2004, Băile Herculane, October 15, 2004, pp. 79-84.
14. Lascu, D., Lascu, M., *High frequency EMI Filter Design for SinglePhase PFC and APF Circuits*, SICEM 2004, Băile Herculane 15 October 2004
15. Lie, I., Tănase, M., *The Nonuniform Sampling Rate Generation in Ultrasonic Beamformers*, Proceedings of International Conference on Signals and Electronic Systems ICSES '04, 13-15, September 2004 Poznan, Poland, pp. 207-210.
16. Lie, I., Tănase, M., *CPLD Based Pulse-Echo Processor*, Proceedings of International Conference on Signals and Electronic Systems ICSES '04, 13-15 september 2004, Poznan, Poland, pp. 337-340.
17. Maranescu, V., Jurca, L., *Mathematical counter/converter for mixed analog and digital simulations*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Communications, Tome 49(63), Fasc 1, 2004, pp 189-192.

18. Negoïtescu, D., Popescu, V., *Quadratic BOOST Converter with PFC Applications*, 5th International Conference on Renewable Sources and Environmental Electro-Technologies, May, 2004, pp. 128-133.

19. Negoïtescu, D., *Controller Design for Single Phase APF Circuits*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Communications, Tome 49(63), Fasc 1, 2004, pp.79-84.

20. Popovici, A., Popescu, V., *Simulation and Implementation of Control Strategy for Matrix Converters Using Simulink Software Package*, EPE-PEMC 2004 Riga, Latvia 11th International Power Electronics and Motion Control Conference, paper ID A27189, 2004, pp. 490-495.

21. Popovici, A., Popescu, V., *Simulation and Analysis of Matrix converter*, EPE-PEMC 2004 Riga, Latvia 11th International Power Electronics and Motion Control Conference, paper ID A27188, 2004, pp. 368-371.

22. Popovici, A., Băbăiță, M., Popescu, V., *Generalized theoretical functional model for Three-Phase Matrix Converters*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Communications, Tome 49(63), Fasc 1, 2004, pp. 59-63.

23. Popovici, A., Băbăiță, M., Popescu, V., *Minimum losses SLM strategy control for matrix converters*, RSEE 2004 5th International Conference on Renewable Sources and Environmental Electro-Technologies, May, 2004, Oradea Romania, pp 142-147.

24. Tănase, M., Toma, C., Popa, D., Lie, I., *Doppler Telemetry Systems for Evaluation Movements in the Atmosphere*, Facta Universitatis, Nis, Ser. Lec. Energ., Vol.17, December, 2004, pp. 313-324.

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 CÂRSTEA: *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. Beniamin DRĂGOI: *Conception of Analog Integrated Circuits*

➤ Assist. eng. Marlene DĂNEȚI: *DSP applications, Statistical signal processing, Failure diagnosis, Multimedia*

➤ 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
- Time-frequency representations
- Wavelets theory applications
- Nonlinear signal processing
- Neural networks
- Coding
- Compression
- Data transmission

KEYWORDS

Signals Circuits and Systems, Adaptive Signal Processing, Time-frequency, Representations, Wavelets theory's applications, Nonlinear Signal Processing, Neural Networks, 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.

RESULTS

CNCSIS grant no.32940/2004, theme no. 11/I-a, code 17, type A: *Optimal data compression algorithms for digital transmissions*

Director: prof. dr. eng. Alexandru ISAR
Value: 160,000,000 ROL
Members: Prof. dr. eng. Miranda NAFORNITA
 Prof. dr. eng. Ioan NAFORNITA
 Prof. dr. eng. Andrei CAMPEANU
 Assoc. prof. dr. eng. Dorina ISAR
 Assoc. prof. dr. eng. Georgeta BUDURA
 Assoc. prof. dr. eng. Corina BOTOCA
 Assist. eng. Florin DARABAN
 Assist. eng. Maria KOVACI
 Assist. eng. Mirela BIANU
 Assist. eng. Caius ULITA

FIELD DESCRIPTION: The main idea of this research was to include in the architecture of a modem different blocks for the compression of text, speech and images. The optimization goal was, each time, to maximize the corresponding rate-distortion function. To accomplish this task a three steps strategy was considered: the computation of a discrete wavelet transform, the filtering into the wavelets domain and the computation of the inverse discrete wavelet transform.

CNCSIS grant no.32940/2004, theme no. 2/I-a, code 517, type A, *Nonlinear methods and techniques in telecommunications*

Director: Asoc. prof. dr. eng. Georgeta BUDURA
Value: 130,000,000 ROL
Members: Prof. dr. eng. Miranda NAFORNITA
 Prof. dr. eng. Ioan NAFORNITA
 Assoc. prof. dr. eng. Corina BOTOCA
 Assist. eng. Maria KOVACI
 Assist. eng. Mirela BIANU
 Assist. eng. Janos GAL
 Dr. Eng. Ileana POPESCU
 Eng. Marius OLTEANU
 Eng. Marius SALAGEAN
 Eng. Mirela VIOR

FIELD DESCRIPTION: The research activities during the phase titled " Identification and compensation of unwanted nonlinearities in telecommunications channels" was oriented on two directions: The study of the nonlinear equalizers, The echo identification and compensation using nonlinear filtering techniques. Regarding the first objective we have studied the implementation of nonlinear equalizers by neural networks. The researches activities for the second objective have been achieved by using the nonlinear filtering techniques based on Volterra model. Efficient implementation of the Volterra filter has been considered.

CNCSIS grant no. 33385/2004, theme no. 15, code 47, type Td, *Watermarking for still images in the transform domain*

Director: Assist. eng. Corina NAFORNITA
Value: 40,000,000 ROL

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).

INTERNATIONAL PROGRAMMS:

GRANT COBBALT: Cooperation Ouest Balkans Baltiques en Telecommunications, 2002-2004

Director: prof. dr. eng. Miranda NAFORNIȚĂ

Value: 27,000 EUR

Participants: Univ. de Nantes, France

DESCRIPTION: The Cobbalt project is an eLearning project. The basic functionalities of the project include presentation of lessons to students, on-line tests, educational content editing. The goal of the project is the creation of a eLearning platform which will be used in virtual universities or in real universities classes. The potential users will not need technical knowledge for working with the application. User interface has to be very intuitive and easy to use. The users can be either students or teachers, and separate account types and functionalities have to be provided for every one of them.

PUBLICATIONS

BOOKS

Botoca, Corina, *Neural Networks. Applications to Signal Processing*, Politehnica Publishing House, Timisoara, 2004, 200 pages, ISBN 973-625-110-1 (published in French).

PUBLISHED PAPERS

1. Baltă, H., Kovaci, M., *A comparasion between weight spectrum of different convolutional code types*, Scientific Conference, University of Oradea, 2004, pp. 174-179.
2. Baltă, H., Kovaci, M., *Turbo-coduri: constructie, performante, perspective*, Academia Fortelor Terestre "Nicolae Balcescu" Sibiu a VIII-a Sesiune de Comunicari Științifice, 11 iunie, 2004, pp. 27-34.
3. Baltă, H., Kovaci, M., *Studiu asupra preciziei curbelor ber construite prin simularea functionarii turbo-codurilor*, Academia fortelor terestre "Nicolae Balcescu"

Sibiu a VIII-a Sesiune de Comunicari Științifice, 11 iunie, 2004, pp. 35-42.

4. Baltă, H., Kovaci, M., *A study on turbo decoding iterative algorithms*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Communications, Tome 49(63), Fasc 2, 2004, pp.33-37;
5. Baltă, H., Kovaci, M., *The performances of convolutional codes used in turbo codes*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Communications, Tome 49(63), Fasc 2, 2004, pp.38-43.
6. Borbas, P., Simon, C., Nafornita, M., *Mobility related protocol in ip networks* Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Communications, Tome 49(63), Fasc 1, 2004, pp. 372-376.
7. Borda, M., Nafornita, I., *Digital watermarking – principles and applications*, Proceedings of the International Conference Communications 2004, Bucharest, 3-4 June, 2004, pp.40-54.
8. Botoca, C., Budura, G., *Nonlinear channel equalization using complex neural networks*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Communications, Tome 49(63), Fasc 1, 2004, pp.226-231
9. Budura, G., Botoca, C., *Efficient implementation of the second order Volterra filter* Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Communications, Tome 49(63), Fasc 1, 2004, pp.91-95.
10. Campeanu, A., *Active filter synthesis based on the mesh current emulation of LC ladder structures*, 7th Biannual Analogue Signal Processing Conference ASSP 2004, Oxford Brookes University, UK, 3rd Nov. 2004, pp.2.1-2.6.
11. Chioncel, C., Gal, J., *Parameter estimation of the chirp signal*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Communications, Tome 49(63), Fasc 2, 2004, pp.87-90.
12. Gal, J., Nafornita, C., Câmpeanu, A., *Lowpass active filter synthesis based on mesh current emulation of LC ladder network*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Communications, Tome 49(63), Fasc 1, 2004., pp. 164-167.
13. Isar, A., Isar, D., *Le debruitage des images par filtrage dans le domain de la transformee en ondelettes discrete a diversite enrichie*, Revue

roumaine des sciences techniques, serie Électrotechnique et Energetique, Tome 49, vol.3 , 2004.

14. Isar, Al., Fablet, R., Augustin, J.-M., *Multi-wavelet denoising for speckle removal in underwater sonar images*, Proceedings of International Conference, „In-situ Seabed Characterization”-SeaTech Week 2004, Brest, France, October 22, 2004, pp.831-836.

15. Isar, Al., Quinquis, A., Legris, M., Isar, D., *Debruitage des images sar: application de la todde (transformee en ondelettes discrete a diversite enrichie)*, Revue scientifique et technique de la defense, no. 64, 2004, Paris, France, pp139-148.

16. Miclau, N., Botoca, C., Budura, G., *Nonlinear complex channel equalization using a radial basis function neural network*, Seventh Seminar On Neural Networks Applications In Electrical Engineering, NEUREL 2004, Proceedings, Belgrad, sept.2004, pag.73-78.

17. Nafornta, C., *A wavelet-based watermarking for still images*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Communications, Tome 49(63), Fasc 2, 2004, pp. 126-131.

18. Nafornta, I., Isar, Al., *Lossy data compression using wavelet*, Proceedings of International Conference Communications 2004, Bucharest, June, 3-4, 2004, Round table: New technologies and trends in IT and Communications, under the aegis of the Romanian Academy of Technical Sciences, pp. 28-39.

19. Naforntă, M., Isar, Al., Isar, D., *A new speech compression method*, Facta Universitatis, Nis, vol. 17, no. 3, December, 2004, pp. 389-402.

20. Oltean, M., Marza, E., Nafornta, M., *Ber performance of differential OFDM systems in fading channels*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Communications, Tome 49(63), Fasc 1, 2004, pp 389-394.

21. Popescu, I., Nafornta, M., Nafornta, I., Constantinou, Ph., *Generalized regression neural network prediction model for indoor environment*, ISCC'2004 - The Ninth IEEE Symposium on Computers and Communications, Alexandria, Egypt, June 29 - July 1st, 2004, pp. 657-661.

22. Quinquis, A., Isar, Al., Isar, D., *Denoising oversampled signals*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Communications, Tome 49(63), Fasc 2, 2004, 2004, pp. 110-113.

23. Simon, C., Tordai, B., Nafornta, M., *End-to-end proportional services for tcp flows*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and

Communications, Tome 49(63), Fasc 1, 2004, pp. 377-382.

24. Rothenstein, B., Nafornta, C., *Red Shift and Blue Shift: A realistic approach*, Physical Interpretations Of Relativity Theory-IX, Imperial College, London, 3 – 6 September 2004, to appear, 6 pages.

25. Telescu, M., Ghisa, L., Besnard, P., Mihăescu, A., *Simulations of impulse response for diffuse indoor wireless channels*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Communications, Tome 49(63), Fasc 2, 2004

26. Vlădeanu, C., Lucaciu, R., Andrei, D., *Optimal chaotic asynchronous DS-CDMA communications over frequency-nonselective rician fading channels*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Communications, Tom 49(63), Fasc 2, 2004, pp 394-397.

PhD RESEARCH ACTIVITIES

1. Prof. dr. eng. Ioan NAFORNIȚĂ, Scientific Ph.D. advisor in the field of Telecommunications

Ph.D. students:

➤ Tiberiu MUNTEAN: *New Signal Processing Techniques for Watermarking*;

➤ Mirela BIANU: *Contributions Concerning Adaptive Signals Processing in Telecommunications* ;

➤ Janos GAL: *Contributions Concerning Kalman Filters in Telecommunications*;

➤ Marius-Ioan SĂLĂGEAN: *Non-Stationary Signal Description by Non-Parametrical Methods*;

➤ Ciprian Petru DAVID: *Contributions Concerning Riffs Detections Using Image Processing Techniques*;

➤ Andy VESA: *Improvement of Digital Radio Systems Detection*;

➤ Adina Valentina DABA: *Non-Stationary Signal Description by Non-Parametrical Method*;

➤ Cristian IGNEA: *Contributions Regarding the Determination and the Measurement of Antennas Parameters*;

➤ Romulus REIS: *Non-Stationary Signal Description by Non-Parametrical Method*;

➤ Mircea COSER: *Contributions on Systems Optimizations using TRIZ-Technique*;

➤ Florin VANCEA: *Contributions regarding Data Protection in Communication Networks*;

➤ Filipescu ADRIAN: *Contributions on Digital Filters Optimal Design*;

➤ Elena Irina LUPEA: *Telecommunication traffic improvement*;

➤ Teodora PELA: *Traffic Optimization on Metropolitan Area Networks*;

2. Prof. Dr. Eng. Miranda NAFORNIȚĂ Scientific Ph.D. advisor in in the field of Telecommunications,

Ph.D. students:

➤ Horia BALȚĂ: *Hierarchic Coding Used in Spread Spectrum Transmission Systems*;

➤ Maria KOVACI: *N-PSK Multiresolution Modulation in COFDM Hierarchic Systems*;

➤ Marius OLTEAN: *Contributions Concerning Radio Channels*

➤ Cornel BALINT: *Speech Compression For Telecommunication Applications*;

➤ Radu LUCACIU: *Optical communication systems with OCDMA*;

➤ Mirela VIOR: *Quality Transmission Improvement Using Turbocodes*;

➤ Caius ULITA: *Equalizers for Radio Channels modems*;

➤ Sorin POPA: *Contributions Concerning the Improvement of Synchronization Techniques for Radio Transmissions Systems*;

➤ Florin Lucian MORGOS: *Radio Channels Equalization Techniques Improvement*.

PhD ESSAYS PRESENTED AT THE DEPARTMENT'S SEMINARS

1. Horia BALTA: *Turbocodes*

2. Mircea COSER: *The design process optimization*

3. Cornel BALINT: *Vectorial compression methods for speech signal*

4. Radu LUCACIU: *Study of multiple access techniques*

RESEARCH TEAM

➤ Prof. dr. eng. Ioan NAFORNIȚĂ: *Signals, Circuits and Systems, Adaptive Signal Processing, Time-frequency Representations, Wavelets Theory's Applications, Microwave Techniques*

➤ Prof. dr. eng. Miranda NAFORNIȚĂ: *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 CÂMPEANU: *Telecommunication Equipment Technology, Telecommunication Circuits*

➤ Assoc. prof. dr. eng. Corina BOTOCA: *Microwave Techniques, Signals, Circuits and Systems, Neural networks*

➤ Assoc. prof. dr. eng. Georgeta BUDURA: *Signals, Circuits and Systems, Nonlinear Signal Processing, Telecommunication Circuits*

➤ Assist. eng. Horia BALȚĂ: *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. Gheorghe DUMITRAȘ: *Signals, Circuits and Systems, Microwave Technology*

➤ Assist. fiz. Mirela BIANU: *Microwave Techniques*

➤ Assist. eng. Tiberiu MUNTEAN: *Optical Transmission and Processing of Information, Theory of Information and Coding, Radiocommunications*

➤ 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 NAFORNIȚĂ: *Digital Signal Processing, Digital Watermarking*

➤ Assist. eng. Marius OLTEANU: *Data Transmission on Radio Channels*

➤ Assist. eng. Marius SĂLĂGEAN: *Signals, Circuits and Systems*

➤ Assist. eng. Andy VESA: *Signals, Circuits and Systems, Mobile Radiocommunications*

CONTACT PERSON

Prof. dr. eng. Ioan NAFORNIȚĂ

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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
- WWW, Hypermedia and Internet
- Multimedia Databases
- Internet Security Techniques

RESEARCH CONTRACTS

CNCSIS Grant no. 32940 /2004, Theme no.19 / I-a, CNCSIS code 23, type A - *Hardware and software research and development, manufacturing and testing an intelligent electronic driver for air-cushion transport systems*

Director: Prof. dr. eng. Marius OTESTEANU

Value: 120,000,000 ROL

Members: Assist. eng. Adina DABA
Assist. eng. Daniel POPA

FIELD DESCRIPTION: The research and development, co-financed by the German company Delu, producer of air-cushion transporters, was focused on intelligent electronic solutions for propulsion and steering of air-cushion industrial transporters. The driving block was developed as an embedded system, using the PIC 16F873 microcontroller, interfacing digital and analogue sensors and transducers. The real time software, developed in assembler, implements independent feedback loops, for automatic control. Programmable parameters are used to improve the accuracy, the stability and the positioning speed. Solutions for a variety of transporter configurations and complexity were proposed, using different embedded system modules.

CNCSIS grant no. 32940 / 2004, theme no. 5, code 26, type At, *The popular traditions and the culture of the multiethnic region Banat – multimedia presentation on CD-ROM and Internet*

Director: Lect. dr. eng. Muguras MOCOFAN

Value: 83,950,000 ROL

Members: Eng. Diana ANDONE
Assist. eng. Artur MULLER
Assist. eng. Marian BUCOS
Eng. Gabriela GLĂVAN

FIELD DESCRIPTION: During the year 2004, the main calendaristic traditions of the Banat ethnic groups will be observed and recorded as audio and video. The team of specialists will interview people from all these groups in order to understand the significance of these ceremonies for their life. Elements of the multiethnic Banat village will be recorded (architecture, costumes, tools). The materials will be processed from an anthropological point of view, by identifying and interpreting the particularities and the interferences between traditions to the different ethnicities in Banat. A comparison will be 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. The team will also collect pieces of music, dance, literature, painting realized by Banat's inhabitants.

INTERNATIONAL PROGRAMMES

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 HAIDUC
Assist. eng. Marian BUCOS
Assist. eng. Artur MULLER
Assist. eng. Mihai ONITA
Eng. Flavius RAICOVICI
Eng. Marius CONDREA

Partners: Ethos Associates, Nottwich, 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 or
www.removingbarriers.com

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 HAIDUC
Assist. eng. Marian BUCOS
Assist. eng. Mihai ONITA
Eng. Marius CONDREA

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

PUBLICATIONS

BOOKS

Oteşteanu, M., Alexa, F., Balint, C., *Digital Telephony – Alcatel 1000E10 System*, West Publishing House, Timișoara, 2004, 170 pages, ISBN 973-360-396-1, (published in Romanian).

PUBLISHED PAPERS

1. Andone, D., VasIU, R., *Developing On-line IT Tools for Assessing Learning*, Scientific Bulletin of the “Politehnica” University of Timisoara, Transactions on Automatic Control and Computer Science, Vol. 49(63), 2004, No. 4, ISSN 1224-600X, pp. 223-226
2. Andone, D., VasIU, R., Bucos, M., Muller, A., Raicovici, F., *Experiences in Developing Multimedia Applications for People with Disabilities*, In *IT, Knowledge, Education, Cooperation and Collaboration*, Editor: Johann Guenther, University of the Danube, Krems, Austria, Oct. 2004, published in Budapest by EATA (European Association for Telematics Applications), <http://www.netties2004.hik.hu>
3. Andone, D., VasIU, R., Bucos, M., Muller, A., Raicovici, F., *The Development of an E-learning “Web Design” Course for People with Disabilities*, Proceedings of the ONLINE EDUCA 2004, 10th International Conference on Technology Supported Learning & Training, Berlin, Germany, December 1-3, 2004, pp. 390, CD version, ISBN 3-9808909-5-3, www.online-educa.com
4. Gui, V., Laitinen, J., *Improving the Accuracy of kNN Classifiers Via Evolutionary Search of Optimized Similarity Measures*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Communications, Tom 49(63), Fasc 1, 2004, pp 321-323
5. Mocofan, M., Căleanu, C., Maranescu, V., *Tree Content Based Search Algorithm for an Image Database*, Acta Tehnica Napocensis, Electronics and Telecommunications, Nr. 2, Vol. 45, 2004, pp. 24-29
6. Oteşteanu, M., Gontean, A., *Microcontroller Applications Reconfiguration Method and Development System*, Proceedings of IFAC, workshop on Programmable Devices and Systems, Cracow, Poland, 2004, pp. 284 – 287
7. Oteşteanu, M., Criste, D.,: *Precision Electronic Driver for Pneumatic Engines*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Communications, Tom 49(63), Fasc 2, 2004, pp. 175 – 179
8. Oteşteanu, M., *Embedded System for Air-Cushion Transporter Control*, Proceedings of

- IFAC, workshop on Programmable Devices and Systems, Cracow, Poland, 2004, pp. 304 – 309
9. Popa, Gh. D., Oteşteanu, M., *Portable PCM Analyzer*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Communications, Tom 49(63), Fasc 1, 2004, pp. 393 – 398
 10. VasIU, R., Mocofan, M., Vatca, D., *Optimizing Linux for Embedded Devices*, Proceedings of the International Conference on Computational Intelligence ICCI 2004, 11-13 February 2004, Troia, Turkey, ISSN 1304-4508
 11. VasIU, R., Andone, D., Bucos, M., *The Development of the “Politehnica” University of Timisoara Distance Learning Web Portal*, In *IT, Knowledge, Education, Cooperation and Collaboration*, Editor: Johann Guenther, University of the Danube, Krems, Austria, Oct. 2004, published in Budapest by EATA (European Association for Telematics Applications), <http://www.netties2004.hik.hu>

PHD RESEARCH ACTIVITIES

Prof. dr. eng. Corneliu TOMA, Scientific Ph.D advisor in the field of Telecommunications

PhD. students:

- Valentin MARANESCU: *Contributions to the performance improvement of voltage regulator;*
- Andreea GĂLEANU: *Contributions to the performance improvement of the GSM system;*
- Artur MULLER: *Contributions to the implementation of the multimedia databases, with local and remote access;*
- Constantin BUCOS: *Modeling and analysis of mobile virtual organizations;*
- Mirela IOANEȘIU: *Contributions to the network security by using virtual private networks (VPN);*
- Codruț IANĂȘI: *Contributions to the video surveillance systems development;*
- Daniel HAIDUC: *Contributions to the color digital reproduction field;*
- Radu TĂNASE: *Ultrasound electronic systems for the movement evaluation in the fluid environment*
- Mihai ONIȚĂ: *Video communications in multimedia applications;*

➤ Mircea TOMOROGA: *Contributions to the conception and design of the analog integrated circuits in CMOS technology;*

➤ Florin-Josef LĂTĂREȚU: *Contributions to the intelligent telecommunication network achievement;*

PhD THESIS SUSTAINED

Konrad V. PFAFF, *Implementation of a method for objective evaluation of the perceived audio quality, with radio broadcasting application*

PhD ESSAYS PRESENTED AT THE DEPARTMENT'S SEMINARS

Mirela Laura IOANEȘIU: *The computers networks security*

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: *Telecommunication Equipment Testing, Television and Digital Television; Multimedia Applications Development, Image Compression, E-learning;*

Assoc. prof. dr. eng. Florin ALEXA: *Television; Sound Technique; Multimedia;*

Lect. dr. eng. Mugur MOCOFAN: *Machine Vision and Pattern Recognition; Multimedia; Studio Equipment; Video Production;*

Assist. eng. Eugen LONTIȘ: *Telephone Transmission Systems; Medical Electronics;*

Assist. eng. Adina DABA: *Television, Telephone Transmission Systems, Information Recording Techniques;*

Assist. eng. Artur MULLER: *Multimedia Data Bases;*

Assist. eng. Constantin BUCOS: *Multimedia; Studio Equipment; Video Production;*

CONTACT PERSON

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RESEARCH GROUP IN RADIO COMMUNICATIONS

RESEARCH FIELDS

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

RESULTS

INTERNATIONAL PROGRAMMS:

Framework Agreement

Coordinator: Assoc. prof. dr. eng. Eugen MARZA
Partners: Ecole d'ingénieurs du Canton de Vaud, Switzerland
 Haute Ecole de Suisse Occidentale, Switzerland

PUBLICATIONS

Mârza, E., Simu, C., *New Wireless Connectivity Solutions for Telemonitoring*, Proceedings of the 5th European Conference E_COMM_LINE_2004, Bucureşti, October 2004, pp. 465-470.

PhD RESEARCH ACTIVITIES

Scientific Advisor: Prof. dr. eng. Anton POLICEC.

PhD Thesis sustained:

Alexandru KISS, *Optimization of Telecommunications networks*

Mircea TARZIU, *Analysis and interpretation methods for electroencefalographic signals*

PhD Essays Presented at the Department's Seminars

Călin SIMU: *Digital Processing Methods for the Cardiac Electrical Signal*

RESEARCH TEAM

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

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RESEARCH GROUP IN SWITCHING SYSTEMS FOR TELECOMMUNICATIONS

RESEARCH FIELDS

- Switching Systems for Telecommunications
- Mail Traffic

PUBLICATIONS

1. Balint, C., *Design and training of codebook for CELP coder*, Annals of the Tibiscus University, Timișoara, Series Informatics, vol. II, Fasc. I, 2004, pp. 7-10.

2. Balint, C., *An improved LBG algorithm for vector quantization*, Annals of the Tibiscus University, Timișoara, Series Informatics, vol. II, Fasc. I, 2004, pp. 11-18.

3. Balint, C., *Efficient vector quantization of speech spectral parameters*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Communications, Tom 49(63), Fasc 2, 2004, pp. 283-286.

4. Balint, C., *Excitation modelling in CELP speech coders*, Scientific Bulletin of the „Politehnica”

University of Timișoara, Transactions on Electronics and Communications, Tom 49(63), Fasc 2, 2004, pp. 287-290.

5. Ionica, T., Balint, C., *Telephone interface for remote control systems with network capabilities*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Communications, Tom 49(63), Fasc 1, 2004, pp.197-200.

RESEARCH TEAM

- Assoc. prof. dr. eng. Lorin FORTUNA: *Switching Systems for Telecommunications. Mail Traffic*
- Lect. eng. Cornel BALINT: *Switching Systems for Telecommunications*

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



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GENERAL PRESENTATION

The Director of the IMCEM research centre is **Prof. dr. eng. Alimpie IGNEA**, PhD advisor. The centre was created in 11 May 001, in accordance with the CNCISIS 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, CNCISIS 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 CONTRACTS

CNCISIS grant No. 1, CODE 19, type AT, Dynamic testing of analog-to-digital converter in multi-tone mode

Director: Lect. dr. eng. Daniel BELEGA
Value: 40,000,000 ROL
Research team: Assist. dr. eng. Robert Pazsitka

FIELD AND GRANT DESCRIPTION

The goal of the project was the dynamic testing of an analog-to-digital converter (ADC) in multi-tone mode. In this mode the test signal is a sum of m ($m > 1$) sinewaves. The project contains two parts. In the first part, the theoretical expressions of some of the most important dynamic parameters of an ADC tested in multi-tone mode was derived. These parameters are: signal-to-noise and distortion ratio (SINAD), effective number of bits (ENOB), total harmonic distortion (THD) and intermodulation distortion (IMD). Because ENOB evaluates the global dynamic performances of an ADC the theoretical expression of the difference between the ENOB obtained by testing in multi-tone mode and the ENOB obtained by testing in single-tone mode will be derived. Based upon this difference the error of the estimation of the ENOB by the value of this parameter obtained by testing in multi-tone mode as

a function of the total harmonic distortion of the sinewave generators and of the number of sinewaves m , will be determined. It was shown that when the sinewave generators have dynamic performances inferior to those of the ADC under test the ENOB can be estimated with high accuracy by testing in multi-tone mode. Also, the effectiveness of a window in reducing the spectral leakage in the case of ADC testing by spectral analysis in multi-tone mode will be studied.

The objective of the second part was the development of a system for ADC testing by spectral analysis in multi-tone mode. The test signals were obtained from signal generators or were implemented by digital signal processors. The most important intermodulation components and the SINAD, ENOB and THD parameters was determined. The data processing and the interactive graphical pages were realized using the Matlab program.

RESULTS

- Elaboration of the theoretical part
- Implementation of the test signals
- Implementation of a system for testing the ADC by spectral analysis in multi-tone mode

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.

RESEARCH CONTRACTS

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 equipment in accordance to EMC directives.

The main contracts of the research group are:

CNCSIS grant No.32940/22.06.2004, Theme No. 12, Code 173, *Electromagnetic monitoring in Spitalul Clinic Judetean No.1 Timisoara*

Director: Prof. dr. eng. Alimpie IGNEA

Value: 173,190,000 ROL

Research team: 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 growth of electromagnetic pollution, electromagnetic monitoring becomes very important at locations with a peculiar destination, especially the ones that include life protection. The Timis County Hospital no. 1 from Timisoara is a high-class unit, with modern equipment, which performs a wide scale 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 behavior, level, frequency range, etc. During measurement process, we used the telemetry on INTERNET.

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
- Measurement of the level of perturbations
- Measurement of the low frequency magnetic field induction
- Measurement of the external sources radiated high frequency perturbations
- Measurement of the continuous magnetic field induction
- Design and realisation of the data acquisition systems for monitoring the transmission of conducted perturbations

Contract with Solectron SRL Timișoara, 2004: Consultancy for EMC measuring and testing,
 Director: Prof.dr.eng. Alimpie Ignea.

Consultancy, examination and technical assistance contract No. 60/21.04.2004, with Luxten Lighten Co Timisoara

Director: Prof. dr. eng. Alimpie IGNEA
 Research team: Prof. dr. eng. Mircea CHIVU
 Assist. eng. Adrian MIHAIUTI
 Assist. eng. Cora IFTODE

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 Site's Supervision, Antennas calibration*

Researches in SENSORS AND TRANSDUCERS

KEYWORDS

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

FIELD DESCRIPTION

Optoelectric 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 I²C 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*

PhD RESEARCH ACTIVITIES

PhD ADVISORS

1. Prof. dr. eng. Eugen POP, Scientific Ph.D. advisor in the field of Electronics and Telecommunications Engineering

Ph.D. students:

➤ Mircea GANDILA *Spectral Estimation - Techniques and Algorithms*

➤ Liliana STOICA *Contributions in Digital Signal Processing*

2. Prof. dr. eng. Sever CRIȘAN, Scientific Ph.D. advisor in the field of Electronics and Telecommunications Engineering

Ph.D. students:

➤ Octavian LUCA: *Spectral analysis of bioelectrical signals*

➤ Ovidiu VETREȘ: *Perturbations study of low frequency electromagnetic fields*

PhD Thesis Sustained:

Alin TEUSDEA, *Contributions to optical and hybrid correlators*

3. Prof. dr. eng. Alimpie IGNEA, Scientific Ph.D. advisor in the field of Electronics and Telecommunications Engineering

Ph.D. students:

➤ Liviu TOMA: *Optoelectronic methods of distance measurements;*

➤ 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 Attila KUBIK, *Automatic testing for dedicated electronic systems.*

➤ Mihai TELESCU, *Contributions to wave propagation modeling*

➤ Petru Lucian SERAFIN, *Contributions to telecommunication lines and terminals testing*

➤ Teodor PETRIȚA, *Contributions to radiofrequency disturbances monitoring.*

PhD Thesis Sustained:

Robert PAZSITKA, *Contribution to sampling and spectral analysis of signals*

PhD Essays Presented at the Department's Seminars

1. Adrian MIHĂIUȚI, *External factors influence in calibrating antennas*

2. Cora IFTODE, *Human body modeling in the study of electromagnetic fields influence*

3. Ciprian DUGHIR, *Specific problems in pulse signal processing*

4. Theodor PETRIȚA, *Radio wave propagation modeling*

5. Liliana STOICA, *Contributions to digital signal processing*

PUBLICATIONS

BOOKS

Mischie, S., *Interfaces for Programmable Instrumentation. Standards and Applications*, Politehnica Publishing House, Timișoara, 2004,

187 pages, ISBN 973-625-129-2 (published in Romanian)

PUBLISHED PAPERS

1. Belega, D., Stoiciu, D., *Polynomial Approximation of the Transfer Function of an Analog-to-Digital Converter*, Facta Universitatis Nis, Series Electronics and Energetics, Vol.17, No.3, 2004, pp. 443-454

2. Belega, D., *Testing of ADCs by Frequency-Domain Analysis in Multi-Tone Mode*, Proceedings of the Romanian Academy, Series A, vol. 5, no. 2, pp. 197-212, May-August, 2004

3. Belega, D., *The Maximum Sidelobe Decay Windows*, Revue Roumaine des Sciences Techniques. Serie Electrotehnică et Energetică, 2004, (in print)

4. Belega, D., *Accurate Sinewaves Implemented With a 16-bit Fixed-Point Digital Signal Processor*, Proceedings of the Symposium on Electronics and Telecommunications, Timișoara, October 22-23, 2004, in Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Telecommunications, Tome 49(63), Fasc 2, 2004, pp. 225-229

5. De Sabata, A., Matekovits, L., *Scattering parameters of symmetrical networks*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Telecommunications, Tome 49(63), Fasc 2, 2004, pp. 317-322

6. Ignea, A., Mihăiuți, A., Petrita, T., *Electromagnetic monitoring in Spitalul Clinic Judetean No.1 Timisoara*, SICEM 2004, Interdisciplinary Symposium on Electromagnetic Compatibility, Baile Herculane, 15 October 2004, pp. 120-125

7. Ignea, A., Mihăiuți, A., Petrița, T., *The measurement of DC magnetic field*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Telecommunications, Tome 49(63), Fasc 2, 2004, pp. 255-258

8. Lascu, M., *Logging Sensors Measurements to a Remote Database Using LabVIEW and Fieldpoint*, EPE-PEMC 2004, 11th International Power Electronics and Motion Control Conference, Riga, published on CD-ROM

9. Lascu, M., *Thermistors' characteristics linearization using neural networks*, RSEE 2004, 5th International Conference on Renewable Sources and Environmental

- Electro-Technologies, Oradea, May 2004, pp.101-107
10. Mischie, S., *Using Linear Prediction in Spectral Domain to Decompose Speech into Modulated Components*, 9th International Conference "Speech and Computer", Saint-Petersburg, Russia, 20-22 Sept. 2004, pp. 203-209
 11. Mischie, S., *On Frequency Measurement by using Zero Crossing*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Telecommunications, Tome 49(63), Fasc 2, 2004, pp. 230-235
 12. Pazsitka, R., Toma, L., Stoiciu, D., De Sabata, A., *Derivation of the Sampling Theorem for Bandpass Signals*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Telecommunications, Tome 49(63), in print
 13. Stoiciu, D., Lascu, M., *PC-based system for automated calibration of a digital voltmeter*, Scientific Bulletin of the „Politehnica” University of Timișoara, Transactions on Electronics and Telecommunications, Tome 49(63), Fasc 2, 2004, pp. 253-254
 14. Stoiciu, D., Dughir, C., *A web-based teaching tool for laboratory classes*, Scientific Bulletin of the „Politehnica” University of Timișoara, Romania, Transactions on Electronics and Telecommunications, Tome 49(63), Fasc 2, 2004, pp. 348-349
 15. Toma, L., Shu, F., Ignea, A., Neddermeyer, W., Schnell, M., *The development of a new system to measure Camber and Toe using stereo cameras*, Scientific Bulletin of the „Politehnica” University of Timișoara, Romania, Transactions on Electronics and Telecommunications, Tome 49(63), Fasc 2, 2004, pp. 236-239