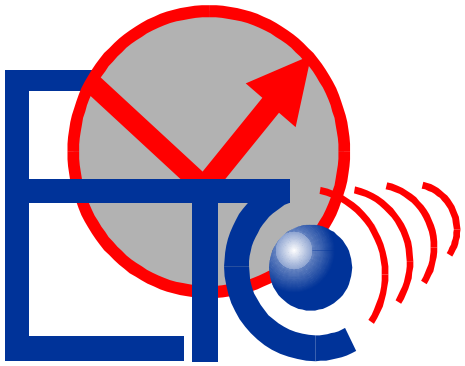
FACULTY OF ELECTRONICS AND TELECOMMUNICATIONS ENGINEERING



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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 accredited by CNCSIS. The Center was created in 11.05.2001, in accordance with the CNCSIS certificate, nr. 106/CC-C. The director of the Center is **prof. dr. eng. Mircea CIUGUDEAN**.

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*

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.

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.

RESEARCH PROJECTS

1. Convenţie cadru Universitatea "Politehnica" Institutul Kathrein - Fachhochschule Rosenheim – S.C. Kathrein Romania S.R.L./24.08.2006
Berührungslose Temeperaturüberwachung und damit einhergeheneder Regelung der Lötprozesse – speziell bei spiegelnden Oberflächen von Mobilfunk – Baugruppen
(Controlul temperaturii fără contact şi reglarea on-line a procesului de lipire pe suprafeţe lucioase la elementele constructive utilizate în comunicaţiile mobile)

Value: 25.000 EUR (3.600 EUR for 2009)
Director: Prof.dr.eng. Ivan BOGDANOV
Members: Prof.dr.eng. Alimpie IGNEA

Prof.dr.eng. Horia CÂRSTEA
Prof.dr.eng. Dan LASCU
Lect.dr.eng. Adrian AVRAM
Lect.dr.eng. Marius RANGU
E. Lovasz

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

1. PN II, IDEI, Proiecte de cercetare exploratorie, cod 945/2008, UEFISCSU contract 599/19.01.2009, *New methods for facial analysis and recognition*

Value: 932.222 Lei, Total (102.416 on 2009)
Director: Assoc.prof.dr.eng. Cătălin CĂLEANU
Members: Prof. dr. ing. Vasile GUI
Prof. dr. ing. Virgil TIPONUȚ
Lect. dr. eng. Valentin MARANESCU
Drd. eng. Daniel IANCHIȘ
Drd. eng. Zoltan HARASZY

FIELD AND GRANT DESCRIPTION

The aim of the research project is investigation and development, trough fundamental research, of new facial expression recognition methods and principles. The research is focused on finding robust solutions for the following subsystems: face representation, face detection, feature selection and extraction, classification. Bioinspired implementation principles, mainly advanced architectures for neural networks, fuzzy sistems and genetic algorithms will serve as tools for attaining the project goals.

ACTIVITIES AND RESULTS

During the project's first year, the following activities were performed: defining the management & research teams, activities & research planning, equipment acquisition, literature survey, overview regarding the available databases, proposal regarding the system structure, proposal regarding acquisitions, representing and coding 2D and 3D information, the study, implementation and testing of preprocessing methods, the study, implementation and testing of feature selection and extraction, analyze the available hardware solutions, defining the electronic schematics, EDA simulations, project achievements checking (monthly), reporting the obtained results, creating the project website.
As the results of the research activity we could mention the dissemination of scientific information trough articles, e.g., YuLi Xue, Xia Mao, C.D. Căleanu, ShanWei Lv., "*Layered Fuzzy Facial Expression Generation of Virtual Agent*", Chinese Journal of Electronics (Thomson Reuters SCI), Vol. 19, No.1, pag. 69-74, 2010 and YuLi Xue, Xia Mao, C.D. Căleanu, ShanWei Lv., "*Robust Facial Expression Recognition Under Occlusion Condition*", Journal of Beijing University of Aeronautics and Astronautics, (in Chinese, accepted, EI source journal).

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2. **PN II, CAPACITATI, Modul III, proiecte de cercetare bilaterale, România-China, cod 39-5/2008, ANCS contract 222/15.04.2009 *Research on Emotional Facial Expression recognition in Complicated Environment***

Value: 55.000 Lei, Total (10.549 on 2009)
Director: Assoc.prof. dr. eng. Cătălin CĂLEANU
Members: Prof. dr. ing. Radu VASIU
Prof. dr. ing. Virgil TIPONUȚ
Prof. dr. ing. Vasile GUI
Prof. dr. ing. Florin ALEXA
Assoc.prof. dr. eng. Corina BOTOCA
Drd. eng. Dan IANCHIȘ
Drd. eng. Zoltan HARASZY

FIELD AND GRANT DESCRIPTION

Study of emotional facial expression recognition represents an advanced research topic in the fields of affective computing and human-computer interaction. It is important to improve the emotion intelligence of the machine and to implement an affective human-machine communication. However, current researches over

the emotional facial expression recognition are usually limited to simple environments, thus cannot be successfully applied in human-computer interaction. Aiming at the above limits and considering the requirements for robust and automatic emotional facial expression recognition in real life, this project proposes the study of emotional facial expression recognition in complicated environment.

ACTIVITIES AND RESULTS

During the project's first year, the following activities were performed: research methods for robust face and facial feature recognition (e.g. eyes, mouth) in complicated environment (e.g. light and pose variation), modelling of emotional facial expression recognition in complicated environment, research methods for robust emotional facial expression recognition in complicated environment.
An agreement of collaboration between University POLITEHNICA Timişoara, Romania and Aeronautic and Astronautic University BEIHANG, Beijing, China has been signed. Also the collaborative framework between the research team lead by dr. Căleanu from the Faculty of Electronics and Telecommunication and the research team lead by dr. Mao from the School of Electronic and Information Engineering has been established.
In June 2009 four members of the Chinese research team has visit our university. During the one week staying fruitful discussions regarding various research topics took place.

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RESEARCH TEAM

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

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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

1. *Intelligent three phase ac power supply,*
104/ 28.09.2007, ANCS – ID1178
Total value: 162.448 Lei (50.883 on 2009)
Members: Prof. dr. ing. Viorel Popescu
Prof. dr. ing. Dan Lascu
Assoc.prof. dr. eng. Adrian Popovici
Assoc.prof. dr. eng. Dan Negoițescu
As. eng. Mircea Băbăiță

INTERNATIONAL PROGRAMMES AND GRANTS

1. LEONARDO DA VINCI Community Vocational Training Action Programme *E-learning Distance Interactive Practical Education (EDIPE)* CZ/06/B/PP-168022
Value: 25.000 EUR (4.319 EUR on 2009)
Director: Prof.dr.eng. Dan LASCU
Members: Prof.dr.eng. Viorel POPESCU
Assoc.prof.dr.eng. Mihaela LASCU
Assoc.prof.dr.eng. Adrian POPOVICI
Assoc.dr.eng. Dan NEGOIȚESCU
Assoc.prof.dr.eng. Adrian POPOVICI
Assist.eng, Mircea BĂBĂIȚĂ
Partners: Technical University of Brno, SK
Technische Universiteit Delft, NL
Technische Universität Wien, AT
Institut für Elektrische Antriebe und Maschinen, Wien, AT
Ruhr Universität Bochum, D
National Technical University of Athens, GR
Institut National Polytechnique de Lorraine, FR
Budapest Muszaki es Gazdasagtudomanyi Egyetem, HU
Fakulta elektrotechniky a informatiky Technická univerzita V Košiciach, SK

Trencianska Univerzita Alexandra Dubcekav Trencine, SK
University of Maribor FERI, SL

FIELD AND PROGRAM DESCRIPTION

So far the E-learning and Distance-learning via the Internet, is focusing on information delivery where typically multi-media rich web pages are offered to the student sitting at home in front of the computer, taking lessons in a certain subject, while keeping contact to other students and teacher via e-mail, chat-rooms, on-line tests, etc.
Other issues focus on the style of teaching under the impression of extensive usage of multi-media like videoclips, audio or "slide shows" in the classroom or via distance (Internet). Advanced material use interactivity and combination of text explaining the theory with interactive programs that allow student to do little experiments via a simulator or solving some engineering problems. The rapid changes in society and technology have also generated a demand for more flexible engineers having many more qualifications than just a high level of technical or scientific specialisation. The drawback of a pure theoretical approach in undergraduate electrical engineering (EE) curriculum is that there is paid less attention to the phenomena that loom by laboratory experiments and exploration of system components. The result of this, in combination with the rapid development of computer applications, is that hands-on and laboratory experience vanished and computer simulations are getting more and more attention.
However, it is crucial to let students have some real practice. The real experiment gives the students a sense of practical testing and they can also see the influence of the second/higher order effects, real time effects, effect of parasitics which are difficult or impossible to be simulated perfectly. The reason is that the simulation is always based on more or less simplified model. Therefore it is important to give to the students a real world experience.
However, to build an experiment is expensive and it is impossible for an educational institute to have the complete scale of experiments. From the learner point of view, there is a need for easy accessible hardware experiment. The hardware experiment should therefore be redesigned such that they also can be accessed on the Web. This way the advance in ICT will be combined with the real practical experience.
The proposed virtual or distance laboratory does not present any web-based simulation. It is a real electro-technical experiment conducted in the laboratory but remotely accessed, controlled and monitored by web-based tools. The experiment is either conducted online or based on recorded valued (virtual experiment). It allows students to perform experiment safely, without guidance and official working hours in the laboratory are not limiting the users. The students can also experience the appearance of the measurement instrument, the electronic components and many more factors such as lay-out. The facility is useful for today's requirement of teaching in the Internet.
The experiments should be not only analysis oriented (to measure and see the results) but also synthesis oriented. It should involve a design aspect. Therefore the measurements are designed as a project with educational philosophy. The technology of such integration is planned to be realised within framework of the project. First of all the technology of such an integration and guidelines to achieve distance Interactive Practical Education will be defined. With this new e-learning tool this technology will be applied to the basic fields of applied electrical engineering starting from fundamentals of EE, through electronics, power electronics, applications of power electronics, dynamics of electro-mechanical systems, including industrial application of electrical drives, motion control and also complex drive systems will be addressed. A complete set of 18 different interactive design oriented virtual or distance laboratories will be prepared with the active participation of the educational expert. This technology will enable us to transfer results of different sectors of education and it will revolutionize education as it is today.

During the kick-off meeting hold in Vienna on November 30th – December 1st the project web page, evaluation group, dissemination plan, financial management, contents of the materials, selection of software for distance practicals management and a workshop on profect oriented and design oriented education were established.

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RESEARCH TEAM

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Assoc.prof.dr.eng. Dan LASCU
Lect.dr.eng. Adrian POPOVICI
Lect.dr.eng. Dan NEGOITESCU
Lect.eng. Mircea BABAITA

Contact person:
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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

1. *Code2Mob,* Application for coding / de-coding 2D bar codes to access Web services on mobile telephones / platforms

Programme: The project represents a ***contribution to the implementation of the National Strategy*** *for Research, Development and Innovation (RDI) and it corresponds to the aim and objectives of Program 4 of The National Plan for Research, Development and Innovation II for 2007-2013*

Total value: 500.000 EURO (48% SIPS, 30% UPT, 28% ATS). (71.986 Lei for 2009)
Director: Prof.dr.eng. Horia Calin CARSTEA
Lecturer.dr.eng. Marius RANGU
Members: Drd.eng. Daniela Mihet
Drd.eng. Paul Constantinescu
Dr.eng. Marian Bucos
Conf.dr. Romeo Negrea
Partners:

- SIPS Design SRL, Deva, Romania, Coordinator of project
- Polytechnic University of Timisoara(UPT), Romania, Partner 1
- Advanced Technology Systems SRL (AST), Targoviste, Romania, Partner 2

FIELD AND GRANT DESCRIPTION

Creating and implementing a platform for mobile telephony. By the Code2Mob application a platform will be implemented which will use the 2D bar codes to access Web Services in SOA architecture, on the mobile telephone. The 2D bar codes will be read with the help of the video camera of the mobile phone. The innovation consists exactly in porting SOA and the Web Services on mobile phones, thus opening unlimited uses of these services. Through the project the platform for Mobile telephony and two demonstrative applications will be created, in two different fields: m-Learning and m-Marketing.

ACTIVITIES AND RESULTS

- Several studies were conducted, regarding the 2D barcodes, their applications to mobile computing and server oriented application (SOA) architectures that would support barcode identification of web services.
- A DataMatrix decoder was designed, implemented and tested, currently being operational on mobile phones running Symbian platforms.
- An mLearning application was designed and is now being implemented. It will be integrated in the "Multimedia History" itinerant exhibition organized by a consortium of several Romanian museums.

Contact person:
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PhD RESEARCH ACTIVITIES

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

PhD students

- 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*
- Cristian BURSAȘIU: *Contributions to the Optimization of Neural Network Applications Development.*
- Alin BRÎNDUȘESCU: *Contributions to the biological signals simulation using artificial neural networks*
- Ionuț MIREL: *Methods for Digital Video Images Processing*
- Călin LAR: *Contributions to the Sensorial Data Fusion*
- Sorin POPESCU: *Optimization of the electrical welding process by means of artificial neural networks*
- Laviniu ȚEPELEA: *Human-Machine Interface.*
- Lucian BUGLEA: *Smart Transducers Array*
- Philipp ROEBROCK, *Multi Sensor Controlled Assembly and Application with Manipulators*
- Daniel IANCHIȘ
- Zoltan HARASZY
- Robert LORINCZ
- Radu MARȘU
- Sebastian MICUȚ
- David CRISTEA
- Adrian FAULHABER SFARAILA

2. Scientific supervisor: *Prof.dr.eng. Tiberiu MUREȘAN*

PhD students:

- Solomon MIMIS: *Integrated Circuits for Transmission Bit Error Rate Measurement*
- Petru PAPAZIAN: *Intelligent Subsystems for Optimal Control of Technological Processes*
- Dan Mircea ANDREICIUC: *Analysis and Correction Methods for Positioning and Orientation of Mobile Industrial Robots*

3. Scientific supervisor: *Prof.dr.eng. Mircea CIUGUDEAN*

PhD students:

- Aurel FILIP: *Researches on CMOS Frequency References*
- Marllene DANEȚI: *Propagation time estimation algorithms for noise sources location*

- Beniamin DRAGOI: *Researches on CMOS Integrated Digital Correlator Conception and Design*
- Radu MIHAESCU, *Telecommunication-system integrated optimum structures based on mobile cellular automatic devices*
- Iosif MUDRA: *Researches on CMOS Integrated Fast Synchronous Comparators*
- Bogdan MARINCA: *Ultrasonic Investigation Optimization by Algorithms Implemented in Dedicated Integrated Circuits.*
- Andrei Paşca
- George Rosu
- Mircea Tomoroga (*cotutela cu prof. dr. ing. Corneliu TOMA*)

4. Scientific supervisor: *Prof. dr .eng. Viorel POPESCU*

PhD students:

- Mircea BĂBĂIȚĂ: *Reaserches on a.c.–d.c. converters*
- Cornel GLISICI: *Contributions regarding improved capabilities of uninterruptible power supplies*
- Daniel ALBU: *Contributions regarding improved capabilities of switched mode converters with PFC applications*
- Lucian PĂUN: *DC/DC converters with optimized energy parameters*
- Adrian ŞCHIOP: *Contributions to theoretical and experimental study of power converters with ac motor drive applications*
- *Florin PRUTIANU: Contributions to theoretical and experimental study regarding optimization of energy converters from wind power station*
- *Cristian VRÂNCILĂ: Contributions regarding improved performance of active power filters*

5. Scientific supervisor: *Prof.dr.eng. Horia CÂRSTEA*

PhD students:

- Dumitru MĂRGELOIU: *Contributions to the improvement of electronic equipment for monittoring 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*
- 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-Florin 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*
- Andy BERCOVICI: *Contributions to the increase of fiability in digital electronics equipment*
- Cornel GLĂVAN: *Contributions to increased security of digital transmissions in special applications.*
- Liviu CHIȘ: *Contributions to pattern recognition test development in automated visual control*
- Călin SÂRBU: *Contributions to predictive test development concerning electrostatic discharge in electronic industry*
- Paul Constantinescu
- Daniela Mihet
- Silvana-Oana Popescu

PHD THESES SUSTAINED

- Ciprian George GAVRINCEA: *Contributions regarding processing of the signal generated by muscle system*, Scientific supervisor Prof.dr.eng. Virgil TIPONUȚ
- Philipp ROEBROCK, *Multi Sensor Controlled Assembly and Application with Manipulators*, Scientific supervisor Prof. dr. eng. Virgil TIPONUȚ
- Mircea-Florin MIHĂESCU: *Contributions to the development of dynamical diagnose and reconfiguration tests in digital fault redundant systems*, Scientific supervisor Prof.dr.eng. Horia CÂRSTEA
- Marllene DANEȚI: *System modelling for fluide transport and propagation time estimation algorithmes for noise sources location*, Scientific supervisor Prof. dr. eng. Mircea CIUGUDEAN

PUBLICATIONS

BOOKS

1. Valentin-Ioan MARANESCU, *Intelligent sensors. Applications*, Politehnica Publishing House, 106 pages (published in Romanian), ISBN 978-973-625-756-5
2. Ionel Sabin, *Electronic Circuit and Devices*, Politehnica Publishing House, 2009, 280 pages, ISBN 978-973-625-124-1 (published in Romanian)
3. Varga S., Maniu I., Radulescu C., Dolga V., Ivan Bogdanov, Ciupe V., *Robotics. Vol 1. Mechanic system*, Politehnica Publishing House, 2009, 302 pages (published in Romanian), ISBN 978-973-625-610-3
4. Dolga V., Maniu I., Ciupe V., Ivan Bogdanov, Rădulescu C., Varga S., *Robotics. Vol 2. Operation system*, Politehnica Publishing House, 2009, 399 pages (published in Romanian), ISBN 978-973-625-996-8

5. Ivan Bogdanov, Maniu I., Dolga V., Rădulescu C., Varga S., Ciupe V., *Robotics. Vol 3. Drivingn system*, Politehnica Publishing House, 2009, 217 pages (published in Romanian), ISBN 978-973-625-903-6
6. Maniu I., Rădulescu C., Varga S., Dolga V., Ivan Bogdanov, Ciupe V., *Robotics. Vol 4. Applications*, Politehnica Publishing House, 2009, 297 pages (published in Romanian), ISBN 978-973-625-842-8
7. Ioan JIVET, *Design Digital Systems using HDL Description*, Orizonturi Universitare Publishing House 2009, 138 pages, ISBN 978-973-638-418-9

PUBLISHED PAPERS

1. Ivan Bogdanov, R.Mârşu, V. Tiponuţ, Matlab *Model for Spiking Neural networks*, WSEAS International Conference on SYSTEMS, Rhodes, Rodos Island, Greece, 22-24 iulie 2009, pp. 533-538, ISBN 978-960-474-097-0, ISSN 1790-2769
2. I. Jivet, V. Gui, A. Brindusescu, *Multiple 3D Sensor Views Object Models Correspondence*, Proceedings of the 13th WSEAS Int. Conf. On Systems, pp. 484-490, ISBN 978-960-474-097-0
3. I. Jivet, *Architecture of an On Electrode Integrated Electronics with an All Digital Interface for EIT*, IFMBE Proceedings Conference on Advancements of Medicine and Health Care Through Technology, 4, ISBN 978-364-204-291-1
4. Firoiu, I.; Isar, D.; Boucher, J.-M.; Isar A, *Hyperanalytic Wavelet Packets*, 6th IEEE International Symposium on Intelligent Signal Processing, 26–28 August, 2009 Budapest, Hungary, pp. 67-72, ISBN 978-1-4244-5058-9
5. Ivan Bogdanov, R. Mârşu, V. Tiponuţ, *New achievements in assistedmovement of visuality impaired in outdoor environments*, WSEAS Transaction on Circuits and Systems, 8(9), pp. 177-186, ISSN 1109-2734
6. I. Lie, V. Tiponut, Ivan Bogdanov, S. Ionel, C. Căleanu, *Automated Meter Reading System for Heat Costs Allocation*, WSEAS Transaction on Circuits and Systems, 2(8), pp. 102-108, ISSN 1109-2734
7. Negrea Catalin, Rangu Marius, *Sequential Sampling Time Domain Reflectometer*, Proc. 15th International Symposium for Design and Technology of Electronics Packages, SIITME2009, Gyula, Hungary, pp. 367-371, ISBN 978-1-4244-50330309
8. Pavol Bauer, Dan Lascu, Mihaela Lascu, Viorel Popescu, Dan Negoiţescu, Mircea Băbăiţă, Adrian Popovici, *E-learning Practical Teaching of Uncontrolled Rectifiers*, EPE 2009, 8-10 September, Barcelona, 13th European Conference on Power Electronics and Applications P1-P10, ISBN 978-907-581-150-09
9. Gontean A., Szabo R., Lie I., *LabVIEW Powered Remote Lab*, SIITME2009 – 15th International Symposium for Design and Technology of Electronics Packages, 17-20 Sep. 2009, Gyula, Hungary, pp. 335-340, ISBN 978-1-4244-50330309
10. Gontean A., Lie I., Szabo R., *Using a Low Cost Programmable Power Supply for Automated Testing*, SIITME 2009 – 15th International Symposium for Design and Technology of Electronics Packages, 17-20 Sep 2009, Gyula, Hungary, pp. 341-346, ISBN 978-1-4244-50330309
11. Popescu S., Gontean A., Lie I., *Comparing FPGA Behavioral Simulation, Post-route Simulation with Real-life Experiments*, SIITME 2009 – 15th International Symposium for Design and Technology of Electronics Packages, 17-20 Sep 2009, Gyula, Hungary, pp. 335-340, ISBN 978-1-4244-50330309
12. Rangu Marius, Svasta Paul, *A New Method for Electrical Characterization of Interconnection Structures*, Annals of the University of Craiova, Romania, 2009, 6(33), Nr. 1, pp. 89-94, ISSN 1841-0626
13. Ivan Bogdanov, R. Mârşu, V. Tiponuţ, *Matlab Model for Spiking Neural networks*, WSEAS International Conference on SYSTEMS, Rhodes, Rodos Island, Greece, 22-24 iulie 2009, pp. 533-538, ISBN 978-960-474-097-0, ISSN 1790-2769
14. Jivet Ioan, Dragoi Beniamin, *Design of Autonomous On-electrode Electronics for EIT*, 10th International Conference on Biomedical Applications of Electrical Impedance Tomography, Manchester, 16-19 June, 2009
15. I. Jivet, B. Dragoi, *Architecture of an On Electrode Integrated Electronics with an All Digital Interface for EIT*, 10th Int Conference on Biomedical Applications of EIT, 16-19 June 2009, Univ. of Manchester, UK, EIT 2009
16. I. Jivet, *Architectures for morphological decomposition by reconstruction in real time*, The 9th Int Symposium on Mathematical Morphology, August 24-27, 2009, Groningen, NL, Abstract Book, pp. 49-53
17. I. Jivet, *Implementing High Speed Stereo Disparity Calculation in a FPGA*, 31th Colloquium of Automation, Salzhausen, IAT Univ Bremen, Nov 5–6 2009, 1 pp.
18. I. Jivet, *Locating Object Posture with Multiple 3D Sensors*, 31th. Colloquium of Automation, Salzhausen, IAT Univ Bremen Nov 5–6 2009, 1 pp.
19. Gontean A., Szabo R., *Comparison between PIC and CompactRIO remote motor control,*

17th Telecommunications forum Serbia, Belgrade, November, pp. 24-26, 747-750

20. Popescu S., Gontean A., *VIRTEX II Timing -Simulation vs Reality*, 17th Telecommunications forum Serbia, Belgrade, November, pp. 24-26, 755-758
21. Gontean A., Szabo R., *Remote temperature measurement with and without FPGA*, 17th Telecommunications forum Serbia, Belgrade, November 24-26, pp. 775-778
22. Lie I., Gontean A., *A Low Power Heat Meter*, Proceedings of the International Conference on Programmable Devices and Systems, Ostrava, Czech Republic, February 10-12, 2009, PDES'2009, pp. 275-280
23. Dragoi Beniamin, *Procedural Design of a CMOS Current Conveyor,* Doctor Etc 2009, Timisoara, UPT, 24-25.09.2009, pp. 17-22, ISSN 2066-883X
24. Papazian Petru, *Using PIC16F448 in Wireless DC Motor Control*, Doctor Etc 2009, Timisoara, UPT, 24-25.09.2009, pp. 76-79, ISSN 2066-883X
25. David Cristea, Virgil Tiponuț, *Tendencies on Signal Conditioning Circuits*, Doctor ETc 2009, 24-25 septembrie 2009, Timisoara, pp. 13-16, ISSN 2066-883X
26. Zoltan Haraszy, Daniel Inachiș, Virgil Tiponuț, *Acoustic virtual relity generation with head related transfer function visualization*, Doctor ETc 2009, 24-25 septembrie 2009, Timisoara, pp. 40-44, ISSN 066-883X
27. Daniel Inachiș, Zoltan Haraszy, Virgil Tiponuț, *Collision detection inspired by locust neural system*, Doctor ETc 2009, 24-25 septembrie 2009, Timisoara, pp. 45-48, ISSN 2066-883X
28. Lorincz Robert Istvan, Virgil Tiponut, Schramel Coroban Vasile, *A novel Initial Rotor Position Estimation Method for BDLC Motor Utilizing*, Doctor ETc 2009, 24-25 septembrie 2009, Timisoara, pp. 55-60, ISSN 2066-883X
29. Sebastian Micut, Virgil Tiponuț, *E-NOISE Type devices*, Doctor ETc 2009, 24-25 septembrie 2009, Timisoara, pp. 61-66, ISSN 2066-883X

RESEARCH INTERESTS

- 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 JIVEȚ: *Designing ASIC (VLSI) Circuits, Design of Digital Systems with Micro-Controllers and Micro-Processors, Clinical Applications of Electrical Bio-impedance Tomography*
- Prof.dr.eng. Aurel GONTEAN: *Programmed Logic Systems, Digital Circuits*
- 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*
- Prof.dr.eng. Dorina ISAR: *Industrial Process Control Equipment, Signal Processing for Signal / Noise Ratio Enhancement*
- Lect.dr.eng. Lucian JURCA: *Analog Electronic Circuits*
- Assoc. prof. dr.eng. Adrian POPOVICI: *Industrial Electronics, Materials for Electronics*
- Assoc. prof. 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*
- Assoc. prof. dr. eng. Ioan LIE: *Electronics, Doppler Telemetry*
- Assoc. prof. dr. eng. Dan NEGOIȚESCU: *Industrial Electronics, Power Factor Correction Circuits*
- Assist.eng. MIRCEA BĂBĂIȚĂ: *Digital Circuits*
- S.l.dr.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*
- Assist.eng. Petru PAPAZIAN: *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

NATIONAL PROGRAMMES

1. ANCS grant type CAPACITATI PN II, 77/CP/II/13.09.2007, year 2009

Improvement of research & development basis in the field of communications at the Faculty of Electronics and Telecommunications, Politehnica University of Timisoara, CDC

Value: 82.396 RON
Director: Prof.dr.eng. Ioan NAFORNITA
Members: Prof. dr. ing.Corneliu TOMA
Prof. dr. ing. Miranda NAFORNIȚĂ
Prof. dr. ing. Alexandru ISAR
Prof. dr. ing. Andrei CÂMPEANU
Prof. dr. ing.Marius OTEŞTEANU
Prof. dr. ing.Vasile GUI
Prof. dr. ing.Radu VASIU
Prof. dr. ing. Adrian MIHĂESCU
Conf. dr. ing. Eugen MÂRZA
Prof. dr.Florin ALEXA
Assoc.prof. dr. ing.Corina BOTOCA
Assoc.prof.dr.ing. Georgeta BUDURA
Asist. drd. ing. Călin SIMU
Lect. dr. ing Cornel BALINT
Lect. dr. Ing. Muguraş MOCOFAN
Lect. dr. ing Horia BALTĂ
As. drd. ing. Maria KOVACI
As. drd. ing. Radu LUCACIU
Lect. dr. ing. Nicolae MICLĂU
As. drd. ing. Janos GAL
As. drd. ing. Gheorghe-Daniel POPA
As. drd. ing. Marius OLTEAN
As. drd. ing. Andy VESA
lect. dr. ing. Corina NAFORNIȚĂ
As. drd. ing. Marius SĂLĂGEAN
lect. dr. ing. Marian BUCOS
As. dr. ing. Ciprian DAVID
As. drd. ing. Mihai ONIȚĂ

FIELD AND GRANT DESCRIPTION

The goal of this project is the endowment of the research & development laboratories of the Communications Department, Faculty of Electronics and Telecommunications (Politehnica University of Timisoara) with modern equipment. These laboratories have as objective the main branches of this particular important R&D domain from the National Strategy entitled Information Technology and Communications.

This is one of the most dynamical fields of R&D at the present moment in Romania; it has a contribution of over 10% in the Gross National Product (GNP). The level of development from the west region of the country tends to be closer in this case to the global medium level. An important trend in the field is the development of integrated systems that transmit and process all types of data and information.

Both the technology and the technical standards organizations are driving toward integrated public systems that make virtually all data and information sources around the world easily and uniformly accessible. Such a system allows integration of services such as telephony, television, and data communications. Computer networks are being widely used as architecture of a communications system.

ACTIVITIES AND RESULTS

New investments in the infrastructure of Research-Development-Innovation were made. The value of the contract for the year 2009 was 82.396 RON.
The lab of Signals and Systems has developed, since 2008, a contract with a telecommunications industry leading firm, Alcatel-Lucent, with a value of 54.000 RON.

The equipped laboratories were:

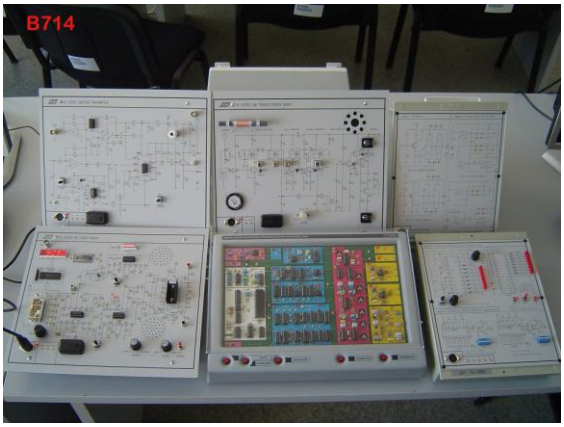
- **Information Theory and Coding (room B219)**

The laboratory of Information Theory and Coding (room B219)

The laboratory of Information Theory and Coding (room B219)

- **Radio communications (room B714)**

The laboratory of Radiocommunications (room B714)



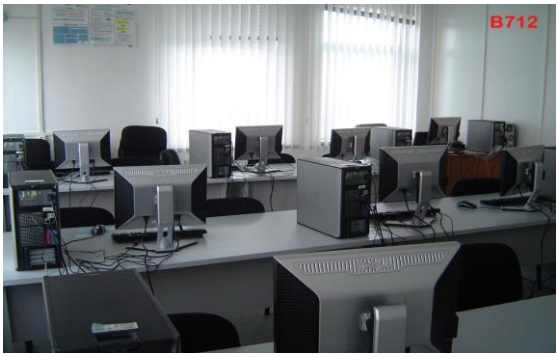
The laboratory of Radiocommunications (room B714)

- **Research Laboratory**

B712b-The research laboratory

The main beneficiaries of improvement of the equipment were students which could made experiments in modern labs.

The following disciplines were beneficiary of project: Signal Circuits and Systems, Theory of Information Transmission, Computer networks architecture, Data communications, Telecommunications Circuits, Network Protocols, Telecommunications Traffic, Optimizing telecommunications networks, Software for Telecommunications, Internet Data Security, Integrated digital networks, Systems for Digital commutation, Radio Communications, Multimedia.



B712a-Research laboratory

Summary of project:

1. New investments in the infrastructure of Research-Development-Innovation 2576,455 thousands RON
2. Value of investment in infrastructure and communications services 1717,6 thousands RON
3. Number of labs involved in: 8

RESEARCH PROJECTS

1. CNCSIS IDEI, ID_930, 667/19.01.2009, Using Wavelets Theory for Decision Making

Director: Alexandru Isar
Value: 999.000 RON (87.448 on 2009)
Members: Prof.dr.eng Ioan Nafornita,
Assoc.prof.dr.eng Sorin MOGA (Telecom Bretagne)
Prof. Andrei Campeanu,
Lect. dr. eng. Corina NAFORNITA
Drd. Ioana FIROIU
Prep.drd. Cristina STOLOJESCU

Web site:
http://www.tc.etc.upt.ro/cercetare/CNCSIS_Idei/cncsisID.htm

FIELD AND GRANT DESCRIPTION

Making decisions is a branch of artificial intelligence that is more and more used in complex applications like medicine (using a diagnostic a treatment decision is made), geology (using images of a region some hypotheses regarding the underground composition and some decision about extraction are made) or communications (using information about the functioning of each element of a communication network some decisions about the resources allocation are made, for example of the frequency bandwidths). According to Bob Colwell, any machine can have artificial intelligence. This must be developed on the basis of understanding and imitation of the human brain. The intelligence results from the action of a large group of specialized neurons that use a world model based on memory to make a continuous series of predictions of future events. The neural networks of the cortex must be interpreted like a distributed memory of pattern sequences stoked in an invariant form, hierarchically arranged, accessed in an associative fashion. Between the neural network applications already known we can find applications in decision making for medicine, geology and communications. To make a correct decision, the decider must have the information in an appropriate form. This is the reason why frequently are used alternative representations of information. A very interesting representation is in this respect the wavelet decomposition. In this project we want to associate the wavelets theory with the neural network theory to solve problems of decisions making in medicine, in geology and in communications. To do this we associated the competences of two senior researchers in the field of neural networks with the competences in the wavelet theory of all six members of our research team.

ACTIVITIES AND RESULTS

Activity: The study of intelligent segmentation techniques for SONAR images based on the association of wavelets with neural networks.
Results:
Papers published.
In journals:

- Firoiu I., Naforniță C., Boucher J.M., Isar A., *Image Denoising Using a New Implementation of the Hyperanalytic Wavelet Transform*, IEEE Transactions on Instrumentation and Measurements, vol. 58, Issue 8, August 2009, pp. 2410-2416, ISI Web of Knowledge, Digital Object Identifier 10.1109/TIM.2009.2016375, ISSN 0018-9456, Impact factor: 0,978 (2008), http://ieeexplore.ieee.org/xpl/tocresult.jsp?isnumber=5159565&isYear=2009.
- I. Buciu, I. Naforniță, *Feature extraction through phase congruency for facial expression analysis*, International Journal of Pattern Recognition and Artificial Intelligence, Special Issue on Facial Image Processing and Analysis, Volume 23, Issue 3, 617-635, 2009, ISI Web of Knowledge.
- Alexandru Isar, Sorin Moga, Dorina Isar, *A New Denoising System for SONAR Images*, EURASIP Journal on Image and Video Processing, Hindawi Publishing Corporation, Volume 2009 (2009), Article ID 173841, doi: 10. 1155/ 2009/ 173841 http://www.hindawi, INSPEC

In proceedings of the international conferences organized abroad the country:

- Corina Naforniță, Alexandru Isar, Maria Kovaci, *Increasing Watermarking Robustness using Turbo Codes*, Proc. WISP 2009, 6th IEEE International Symposium on Intelligent Signal Processing, 26–28 August, 2009 Budapest, Hungary, pp. 113-118, ISBN 978-1-4244-5058-9, ISI Proceddings.
- Ioana Firoiu, Dorina Isar, Jean-Marc Boucher, Alexandru Isar, *Hyperanalytic Wavelet Packets*, Proceedings WISP 2009, 6th IEEE International Symposium on Intelligent Signal Processing, 26–28 August, 2009 Budapest, Hungary, pp. 67-72, ISBN 978-1-4244-5058-9, ISI Proceedings.

In the proceedings of international conferences organized in our country:

- Ioana Firoiu, Alexandru Isar, Jean-Marc Boucher, *An Improved Version of the Inverse Hyperanalytic Wavelet Transform*, Proceedings of IEEE International Symposium SCS'09, Iaşi, Romania, July 9-10, 2009, ISBN 1-4244-0968-3, pp. 13-16, ISI Proceedings.

- Marius Oltean, Alexandru Isar, *On the Time-Frequency Localization of the Wavelet Signals with Application to Orthogonal Modulation*, Proceedings of IEEE International Symposium SCS'09, Iasi, Romania, July 9-10, 2009, ISBN 1-4244-0968-3, pp. 173-176, ISI Proceedings.
- Cristina Stolojescu, Alina Cușnir, Sorin Moga, Alexandru Isar, *Forecasting WiMAX BS Traffic by Statistical Processing in the Wavelet Domain*, Proceedings of IEEE International Symposium SCS'09, Iasi, Romania, July 9-10, 2009, ISBN 1-4244-0968-3, pp. 177-180, ISI Proceedings.
- Corina Naforniță, Alexandru Isar, *On the Choice of the Mother Wavelet for Perceptual Data Hiding*, Proceedings of IEEE International Symposium SCS'09, Iasi, Romania, July 9-10, 2009, ISBN 1-4244-0968-3, pp. 233-236, ISI Proceedings.
- Ioan Buciu, Ioan Naforniță, *Non-negative Matrix Factorization Methods for Face Recognition under Extreme Lighting Variations*, Proceedings of IEEE International Symposium SCS'09, Iasi, Romania, July 9-10, 2009, ISBN 1-4244-0968-3, pp. 125-128, ISI Proceedings.

Contact person:
- alexandru.isar@etc.upt.ro

2. CNCSIS grant No. 403, CODE TD-403, type Grant for young Ph.D. Students, *Title: Optimization Techniques for Radio Channels Transmission*
Director: Marius Oltean
Value: 42.500 RON (1.770 RON on 2009)

FIELD AND GRANT DESCRIPTION

The project is focused on modern multi-carrier approaches based on wavelet functions. The investigated technique is referred to as Wavelet OFDM. It is shown that this method mitigates some of the traditional OFDM drawbacks (high sensitivity to frequency and time synchronization errors, insufficient out of band rejection, efficiency reduced by the cyclic prefix).

ACTIVITIES AND RESULTS

1. PhD thesis finalized

M. Oltean, *Contribution to the optimization of data transmission through radio channels, using wavelet functions*, ISBN 978-606-554-050-7, Editura POLITEHNICA Timisoara.

2. Two papers presented at IEEE conferences

M. Oltean, A. Isar, *On the time-frequency localization of the wavelet signals, with application to orthogonal modulations*, Proceedings of ISSCS'09, Iaşi, July 2009, pp.173-177.

M. Oltean, M. Naforniță, *Errors per Scale Statistics for a Wavelet OFDM transmission in Flat Fading Channels*, Proceedings of WISP'09, Budapesta, August 2009, pp. 119-124.

Contact person:
E-mail: marius.oltean@etc.upt.ro

PUBLICATIONS

BOOKS

1. Andrei Câmpeanu, János Gál, *Adaptive method for signal processing*, Politehnica Publishing House, 407 pages (published in Romanian), ISBN 978-973-625-605-9
2. Kovaci Maria, *Contributions in performances analysis and improvements of turbo codes used in flat fading channels*, Ph.D Thesis, Politehnica Publishing House, 160 pages, ISBN 978-973-625-994-4
3. Isar Alexandru, Kovaci Maria, *Network security*, Politehnica Publishing House, Distance Learning course, 151 pages
4. Balta Horia, Kovaci Maria, *Teoria Informației şi a codării. Indrumător de lucrări de laborator*, http://www.tc.etc.upt.ro/teaching/tic/IndrumatorTIC.pdf, 48 pages, published online
5. Balta Horia, Kovaci Maria, Lucaciu Radu, *Teoria Informației şi a codării. Culegere de probleme vol.1*, http://www.tc.etc.upt.ro/, teaching/tic/CulegereTIC1.pdf, 65 pages, published online
6. Corina Naforniță, *Signals and Systems, vol. 1*, Politehnica Publishing House, 355 pages, ISBN 978-606-554-013-2 (978-606-554-014-9 vol I)
7. Corina Botoca, Vasile Gui, Florin Alexa, Georgeta Budura, *Metode de interpretare şi prelucrare asistată a imaginilor medicale*, Politehnica Publishing House, 240 pages, ISBN 978-973-625-980-7

PAPERS

1. I. Buciu and Ioan Nafornita, *Feature extraction through phase congruency for facial expression analysis*, International Journal of Pattern Recognition and Artificial Intelligence, Special Issue on Facial Image Processing and Analysis, Volume 23, Issue 3, pp. 617-635, 2009, ISSN 0218-0014
2. Ioana Firoiu, Corina Nafornita, Jean Marc Boucher, Alexandru Isar, *Image Denoising Using a New Implementation of the Hyperanalytic Wavelet Transform*, IEEE Transactions on Instrumentation and Measurements, vol. 58, Issue 8, August 2009, pp. 2410-2416, ISSN 0018-9456
3. Nafornita Corina, Alexandru Isar, *On the Choice of the Mother Wavelet for Perceptual Data Hiding*, IEEE International Symposium on Signals, Circuits and Systems ISSCS 2009, Iasi, Romania, 9-10 July 2009, vol. 1, pp. 233-236, ISBN 978-1-4244-3784-9
4. Nafornita Corina, Alexandru Isar, Maria Kovaci, *Increasing Watermarking Robustness using Turbo Codes*, IEEE International Symposium on Intelligent Signal Processing

WISP 2009, Budapest, Hungary, 26-28 August 2009, pp. 113 – 118, ISBN 978-1-4244-5058-9

5. Ioan Buciu, Ioan Nafornita, *Non-negative Matrix Factorization Methods for Face Recognition under Extreme Lighting Variations,* 2009 IEEE International Symposium in Signals, Circuits & Systems (ISSCS 2009), Vol. 2, pp. 125-128, 2009, ISBN 978-1-4244-3784-9
6. Kovaci Maria, Balta Horia, Nafornita Miranda, *On Using Turbo Codes Over Rice Flat Fading Channels*, Proceedings of International Symposium SCS, ISSCS 2009, Iasi, July, 09-10, 2009, pp. 461-464, ISBN 978-1-4244-3784-9
7. Ioana Firoiu, Alexandru Isar, Jean-Marc Boucher, *An Improved Version of the Inverse Hyperanalytic Wavelet Transform*, Proceedings of IEEE International Symposium SCS'09, Iaşi, Romania, July 9-10, 2009, pp. 13-16, ISBN 978-1-4244-3784-9
8. Cristina Stolojescu, Alina Cuşnir, Sorin Moga, Alexandru Isar, *Forecasting WiMAX BS Traffic by Statistical Processing in the Wavelet Domain*, Proceedings of IEEE International Symposium SCS'09, Iaşi, Romania, July 9-10, 2010, pp. 177-180, ISBN 978-1-4244-3784-9
9. Ioana Firoiu, Dorina Isar, Jean-Marc Boucher, Alexandru Isar, *Hyperanalytic Wavelet Packets*, Proceedings WISP 2009, 6th IEEE International Symposium on Intelligent Signal Processing, 26–28 August, 2009 Budapest, Hungary, pp. 67-72, ISBN 978-1-4244-5058-9
10. Botoca Corina, R.Bardan, M. Botoca, F. Alexa, *Prediction of Prostate Capsule Penetration using Neural Networks*, Recent Advances in COMPUTATIONAL INTELLIGENCE, MAN -MACHINE SYSTEMS and CYBERNETICS (CIMMACS '09) Puerto De La Cruz, Canary Islands, Spain, December 14-16, 2009, pp. 28-33, ISSN 1790-5117, ISBN 978-960-474-035-2
11. M. Oltean, M. Nafornita, *Errors per Scale Statistics for a Wavelet OFDM Tansmission in Flat Fading Channels,* Proceedings of WISP'09, Budapesta pp. 119-124, ISBN 978-1-4244-5058-9
12. M. Oltean, A. Isar, *On the time-frequency localization of the wavelet signals, with application to orthogonal modulations,* Proceedings of ISSCS-2009, Iasi, pp. 173-176, ISBN 978-1-4244-3784-9
13. Budura Georgeta, Balint Cornel, Marza Eugen, *Comparative Results in GSM/GPRS Networks Modeling According to Erlang-B and Engset Traffic Models*, The 13th WSEAS Int. Conf. on Communications, Recent Advances in Communications, pp. 172-177, ISBN 978-960-474-098-7
14. Budura Georgeta, Balint Cornel, Marza Eugen, *Traffic Modeling and Performance Evaluation in GSM/GPRS Networks*, The 13th WSEAS Int. Conference on Communications, Recent Advances in Communications, pp. 147-152, ISBN 978-960-474-098-7
15. Budura Georgeta, Balint Cornel, Adrian Budura, *Radio Resources Dimensioning According to Different Allocation Strategies in GSM/GPRS Networks*, Recent Advances in Computational Intelligence, Man -Machine Systems and Cybernetics, Proceedings of the 8th WSEAS Int. Conf, CIMACS, pp. 168-173, ISBN 978-960-474-144-1
16. Budura Adrian, Silviu Crisan, Budura Georgeta, *A New Approximating Model for the Time Invariant Nonlinear Operators with Fading Memory*, Recent Advances in Computational Intelligence, Man-Machine Systems and Cybernetics, Proceedings of the 8th WSEAS Int. Conf, CIMACS, 174-179, ISBN 978-960-474-144-1
17. MANGRI Marin, NAFORNIȚĂ Monica, *Tracing Method with Intra and Inter Protocols Correlation,* Journal of Electrical and Electronics Engineering, pp. 165-169, ISSN 1844-6035
18. Alexandru Isar, Sorin Moga, Dorina Isar, *A New Denoising System for SONAR Images,* EURASIP Journal on Image and Video Processing, Hindawi Publishing Corporation, Volume 2009, doi: 10.1155/ 2009/ 173841, Revista cu difuzare electronica, Article ID 173841 1687-5176, e-ISSN 1687-5281
19. R. Bardan, Botoca Corina, M. Botoca, G. Budura, *Neural Networks Assisted Prediction Of Prostate Confinement Of Adenocarcinoma,* Timişoara Medical Journal, vol. 51. nr. 1, pp. 70-76, ISSN 1583-5251
20. Budura Georgeta, Balint Cornel, Budura Adrian, Marza Eugen, *Traffic Models and Associated Parameters in GSM/(E)GPRS Networks,* WSEAS Transactions on Communication, Issue 8, Vol. 8, 2009, pp. 833-842, ISSN 1109-2742
21. Botoca Corina, R. Bardan, M. Botoca, F. Alexa, *Organ Confinement of Prostate Cancer. Neural Networks Assisted Prediction,* Meditech Cluj, 23-26 September 2009, IFMBE Proceedings, Springer Verlag Series, pp. 287-290, ISSN 1680-0737
22. Botoca Corina, Gui Vasile, Budura Georgeta, Alexa Florin, Bucuras Viorel, Dema Alice, Botoca Mircea, Bardan Razvan, *Studii vizând dezvoltarea unui sistem bazat pe retele*

neuronale pentru diagnosticul si prognosticul unor afectiuni urologice, Revista de politica stiintei si scientometrie, Vol. VI Numar Special 2009, 40 pp., ISSN 1582-1218

23. Kovaci Maria, Balta Horia, *On Using Turbo Coding over Rayleigh Flat Fading Channels,* International Conference on Engineering Technologies-ICET 2009, Novi Sad, April 28-30 2009, pp. 149-154, ISBN 978-86-7892-161-2
24. Balta Horia, Kovaci Maria, Botiz Ciprian, Poenaru Cristian, *Bit Decoding Versus Symbol Decoding in Multi-Binary Turbo Decoders,* International Conference on Engineering Technologies-ICET 2009, Novi Sad, April 28-30 ICET 2009, pp. 145-148, ISBN 978-86-7892-161-2
25. János Gál, Andrei Câmpeanu, Ioan Naforniță, *Esimation of Chirp Signals by Extended Kalman Filtering,* Lucrările sesiunii de comunicări ştiinţifice "Doctor Etc 2009", pp. 35-40, ISSN 2066-883x
26. Andy VESA, *Space-Time Block Coding for Wireless Communications*, Lucrările sesiunii de comunicări ştiinţifice "Doctor Etc 2009", pp. 107-110, ISSN 2066-883x
27. Simu Calin, *A generator for synthetic electrocardiographic signals*, Doctor ETc 2009, 24-25 septembrie 2009, Timisoara, pp. 103-106, ISSN 2066-883X

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*
- Romulus REIS, *Non-Stationary Signal Description by Non-Parametrical Method*
- Janos GAL, *Contributions on Kalman Filters Use in Telecommunications*
- Marius SALAGEAN, *Non-Stationary Signal Description by Non-Parametrical Method*
- 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*,
- Florin Dumitru CHIS, *Improving Security Level In Broadband Networks*.
- Arpad IOZSA, first year student.
- Mirela MIOC, first year student.

2. *Scientific Supervisor: Prof. dr. eng. Miranda NAFORNIȚĂ*

PhD students:

- 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*
- Ioan CARLIA, *Collaborative adhoc wireless mobile networks*
- Marin MANGRI, *Optimizarea tracing-ului la protocoalele de timp real din IMS (IP Multimedia Subsystems)*
- Calin SIMU, *Acquisition of EKG signals using Bluetooth*

3. *Scientific Supervisor: Prof. dr. eng. Alexandru ISAR*

PhD students:

- Ioana Firoiu (Adam), *Despeckling of sonar images by multi-resolution filtering*
- Cristina Stolojescu (first year student)
- Victor CUTEANU, *Contributii la proiectarea unui receptor de satelit*
- Petru LAZAR, *Protocoale utilizate in retele de comunicatii wireless*
- Ioan ANDOR, *Tehnici de asigurare a securitatii in retele de comunicatii wireless*
- Beatrice, ARVINTI, *Prelucrarea inteligenta a electrocardiogramelor pentru monitorizare la distanta*
- Lucian, ARDELEAN, *Tehnici de reducere a interferentelor in tehnologia WiMAX*

PHD THESES SUSTAINED

- Maria KOVACI: *Contributions in performances analysis and improvements of turbo codes used in flat fading channels,* Scientific supervisor Prof. dr. eng. Miranda NAFORNITA
- Mircea COSER, *Contribuții privind optimizarea sistemelor folosind tehnica TRIZ,* Scientific supervisor Prof. dr. eng. Ioan NAFORNITA

RESEARCH TEAM

- Prof.dr.eng. Ioan NAFORNIȚĂ: *Signals, Circuits and Systems, Adaptive Signal Processing, Time-frequency Representations, Wavelets Theory's Applications, Microwave Techniques, Image processing, Digital watermarking*
- 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*
- Lect.dr.eng. Cornel Balint: *Speach coding, Telecommunications network, Digital Switching*
- Lect.dr.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*
- Lect. dr. eng. Nicolae MICLĂU: *Optical Transmission and Processing of Information, Theory of Information and Coding*
- Lect.dr.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: Radio communication, Wireless communications*

CONTACT PERSON

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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
- Multimedia Databases
- Internet Security Techniques
- E-learning
- Advanced learning technologies
- WWW, Hypermedia and Internet

KEYWORDS

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

INTERNATIONAL PROJECTS

1. LLP project: *"VICADIS – Virtual Campus for Digital Students",* Agreement **2007-2611/001-001,** Project number **134039-LLP-1-2007-1-RO-ERASMUS-EVC**

Director: Prof.dr.eng. Radu VASIU
Value: 365.747 EURO
Members: Assoc.lect.eng. Diana ANDONE
Lect.dr.eng. Mugur MOCOFAN
Lect.dr.eng. Marian BUCOS
Assist.eng. Mihai ONITA
Assist. Delia ROBESCU-TANASE
Eng. Marius CONDREA
Lucia RAZMERITA, journalist
Cristian TECU, PhD student
Iasmina ERMALAI, PhD student
Andrei TERNAUCIUC, PhD student
Bogdan DRAGULESCU, PhD student
Partners: Universita degli Studi di Palermo, Italy
Baltic Education Technologies Institute, Lithuania
University of Miskolc, Hungary
Oulu University of Applied Sciences, Finland
University of Brighton, UK
VISIONI Di Caro arch. Ernesta, Italy
Euro-Contact Business School, Hungary
BRIDGEMAN SRL, Romania
JME Associates Ltd, UK

FIELD DESCRIPTION

The main objective is to build a virtual campus for digital students aimed at providing open educational resources and tools available and accessible for all students and ensuring the interoperability between the different eLearning environments used in the partner universities.

Aims of the project:

• To overview and implement emerging tools and technology commonly referred to as "social software" that can create personal as opposed to institutional learning environments, as well as the mobile learning tools.

• To support practitioners in becoming aware of the new features of the digital students, to learn to effectively use and develop resources with new digital technologies and new communication tools in ways that are aligned with what they want to achieve educationally.

• To provide the organisational and technical framework for the development of an interoperable virtual campus

• To make available a virtual campus based on Open Educational Resources which will offer a free, open personal learning environment

• To improve the quality of education in eLearning by international co-operation and by new methodological approach to learning. The project intends to develop an interoperable virtual campus, not a new one to replace the existing ones used in the universities, and to provide a new methodology based on modern techniques of education such as open sources, adaptability and interactive learning.

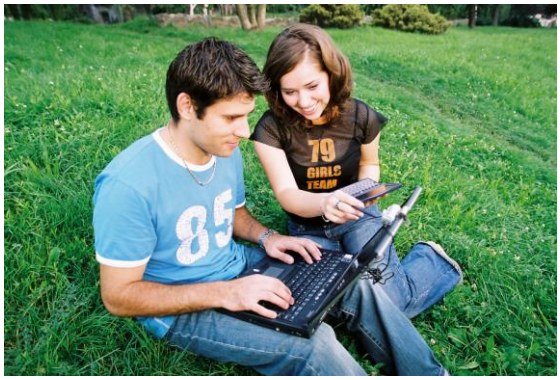
• To evaluate, test and transfer the ICT tools, pedagogical methodology and the Set of Guidelines to other education and training areas and throughout Europe.

The main scope of ViCaDiS is to provide an accessible and attractive environment for all students within the Member States, using already existing tools which will be enhanced with new tools wanted by the new generation of students. By providing students the tools which they use anyway extensively outside the institutional framework of learning (wiki, blogs, forums, IM, podcasting, RSS) ViCaDiS will support the learning attractiveness of the university curricula, will improve the quality of the learning process by encouraging the exchange of information/knowledge between students from different universities, and will reduce university drop-out or student de-motivation for learning. It will also produce an instructional or pedagogical shift inside the universities eLearning moving the focus from the education materials and technology to the user- student, to user generated content.

In ViCaDiS, a wide range of ODL actors from EU and CEE countries will focus on developing an innovative approach for enhancing international eLearning by moving the strength from the institutional learning environment to the personal learning environment (PLE) which focuses on students. It will also produce an instructional or pedagogical shift inside universities eLearning moving the focus from the education materials and technology to the user-student, to user generated content.

The main objective is to build a virtual campus for digital students aimed at providing open educational resources and tools available and accessible for all students and to ensure the interoperability between the different eLearning environments used in the partner universities.

The goal of ViCaDiS is to create an attractive environment for all students within the Member States, using already existing tools which will be enhanced with new tools wanted by the new generation of students. An innovative multilingual ICT-based environment unique in Europe (as an international virtual campus), it will incorporate several open educational resources (library, glossary, external links, student projects, course activities), open educational tools (wiki, blog, forum, calendar, podcasting, instant messaging communication, audio-video conferencing over IP, RSS, mobile text messaging, mobile accessibility to ViCaDiS) and will promote social networking as an instructional method.



The project **workpackages** are:

- Developing and testing of the ViCaDiS scenario
- ViCaDiS tools design and implementation
- Piloting/testing and evaluation of ViCaDiS
- Evaluation and elaboration of the Set of Guidelines
- Exploitation of ViCaDiS
- Dissemination and Awareness raising of ViCaDiS
- Project management of ViCaDiS

The main **outcomes** of the project are:

- open personal learning environment methodology
- ViCaDiS scenarios
- ViCaDiS multilingual virtual campus: online environment and mobile environment based on Open Educational Resources
- Multilingual web portal
- Multilingual Set of Guidelines (on paper, CD and online)
- ViCaDiS evaluation
- Promotional and multiplication materials

2. Leonardo da Vinci II project "Creative Trainer", Agreement **LLP/LdV/TOI/2007/AT/19**

Director:	Prof.dr.eng. Radu VASIU
Value:	20.082 EURO
Members:	Assoc.lect.eng. Diana ANDONE
	Lect.dr.eng. Mugur MOCOFAN
	Lect.dr.eng. Marian BUCOS
	Assist.eng. Mihai ONITA
	Andrei TERNAUCIUC, PhD student
	Bogdan DRAGULESCU, PhD student
	Tatiana TERNAUCIUC
Partners:	University of Graz, Austria
	SFG Graz, Austria
	University of Wien, Austria
	University of Marburg, Slovenia
	College Drenthe, Netherlands
	Innova Venice, Italy

FIELD DESCRIPTION:

The main aim of the project is to disseminate the creativity technique „idea machine" via developing a training course on this topic, to train partners from Europe and to carry out national training courses in the partner countries.

The methodology of the „idea machine" is based on:

- Working out a mass of ideas
- Including insiders and outsiders in the idea finding process

The second requirement of the Leonardo programme is to transfer results from projects, especially via training projects to Europe.

The project phases are:

- Project management
- Development of a training course
- Pedagogical concept
- Web-based learning materials
- TTT- course
- Company projects
- National training courses
- Certification
- dissemination

The training course will consist on 3 modules:
Module 1: Ideamachine
Module 2: creativity and youth
Module 3: idea evaluation

3. Leonardo da Vinci II project "ESIL - European Sustainable Innovation License (for SME´s)", Agreement **LLP/LdV/TOI/2008/AT/23**

Director: Prof.dr.eng. Radu VASIU
Value: 11.157 EURO
Members: Assoc.lect.eng. Diana ANDONE
Andrei TERNAUCIUC, PhD student
Bogdan DRAGULESCU, PhD student
Tatiana TERNAUCIUC
Partners: Cleaner Production Centre Graz, Austria
Stenum GmbH, Austria
Bit Media E-Learning Solution, Austria
University of Maribor, Slovenia
Enviros, Czech Republic
AREA Science Park, Italy
Insin, Germany
LTC, Sweden
Cork Institute of Technology, Ireland
Hess Innovation, Switzerland

FIELD DESCRIPTION:

Aims of the project:
1. **Uniform** understanding and **model of an innovation training** (innovation & sustainabily)
2. Creating a **Standard of Quality for Training of Innovation management**, incl. an **examination and a certificate „Innovation Licence"** (especially for SME´s)
3. Setting up a **European Network & regular conferences for SME's**
4. Creating an **E-Learning platform**

Estimated results of the project:

- An **integrated Training Concept for "Sustainable Innovation Management"**, combining existing and sucessfully proved training materials. Considering the main barriers for adult education and training of people from industry. (time, availability, costs, lack of competences in structured problem solving)
- An **ESIL – Training Concept** with an clear, given structure: introduction module and continuing, advanced training modules
  - **2 days introduction training module** (overview of innovation management and sustainability) and
  - **4 to 8 2-days advanced training modules** (innovation strategy and sustaimable development, innovation and creativity, tools for analysis of problems, tools for generation ideas, tools for assessment and protection of ideas, r&d-project management,…)
- Consolidated Course Materials (slides, working materials, text, …)

➢ Coordinated **Concept for Examinations and Certification** (Model: ECDL)

RESEARCH PROJECTS

1. CNCSIS IDEI, ID_930, 667/19.01.2009 *Title:* Fuzing Statistic and Semantic Modeling in Image Sequences Analysis

Director: Prof.dr.eng Vasile GUI
Value: 82.286 RON
Members: Prof.dr.eng. Florin ALEXA
Assoc.rof.dr.eng. Cătălin CĂLEANU
Teach assist. dr. eng. Ciprian DAVID
Teach assist. eng. Gheorghe POPA
Dr.eng. Georgiana SIMION

FIELD AND GRANT DESCRIPTION

Probabilistically oriented approaches for image sequence analysis have difficulties in modeling complex situation encountered in real world applications. To alleviate this problem, we propose a new theoretical framework for fusing the statistical thinking level with the semantical level in the benefit of both. We will test the effectivenes of the concept on object tracking and motion estimation tasks, related to human body motion analysis. We define three main research objectives. The first one is the development of a semantically guided kernel traker. The best method to exploit semantic information extracted from the iamge sequence through inference in the traking performance improvement will be investigated. Our second research objective is to find effective use of the new sparse representation in motion modeling and semantic inference. The third research objective is to enhance a foreground/background segmenter by higher level information extracted from the processed image sequence.

ACTIVITIES AND RESULTS

Development of a semantically guided tracker
Robust background estimation
Contact person:
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2. PNCD II project nr. 11-057/14.09.2007: Bio-medical signal acquisition and remote transmission over mobile computing equipments BIOMED-TEL

Director: Prof.dr.eng. Radu VASIU
Value 2009: 85.000 RON
Members: Prof.dr.eng. Coorneliu TOMA
Assoc.lect.eng. Diana ANDONE
Lect.dr.eng. Mugur MOCOFAN
Lect.dr.eng. Marian BUCOS
Assist.eng. Mihai ONITA
PhD student Iasmina ERMALAI
PhD student Andrei TERNAUCIUC
PhD student Cristian TECU
PhD student Bogdan Dragulescu
Partners: Transilvania University of Brasov
Technical University of Cluj-Napoca
Siemens PSE Brasov
IBCI – Institute for Cardiovascular Diseases Iasi

FIELD AND GRANT DESCRIPTION:

Cardiovascular affections are a prime cause of mortality and morbidity in Romania. The risk of cardiovascular morbidity and mortality remains high despite the attempts of correcting the cardiovascular risk factors. In the field of cardiovascular pathology the death risk by cardiovascular or vascular-cerebral accident persists even after the patients have left the hospital. Monitoring the health condition of these and the analysis of evolution trends of the biophysical and biochemical parameters represents an essential prevention factor.

The project envisages research, design and implementation of a flexible and self-adapting system for the monitoring of biological signals. Research and design activities will be oriented towards developing a system architecture and organization for remote monitoring and creating the interfaces for acquisition, monitoring and remote transmission to a hospital unit (hub). The signals acquired from the patient include: heart bio-potentials, blood pressure, blood O2 concentration, heart and breath rate, temperature, blood glucose concentration etc. The mobile computing equipments (MCE) integrated in the systems will be: Personal Digital Assistant (PDA), and/or „smart phones" (mobile phones MP).
The project will use hard – and software platforms (PDA and MP) of broad usability, which correspond to the requirements of the application in terms of computing power and also by their low price. Based on intelligent interfaces that will be designed, the system will automatically integrate the sensors in „plug & play" mode and also adapt its communication strategy with the hub/dispatcher for cost minimization and for ensuring the reliability and availability of the data link. It cannot be neglected, that this system development strategy will offer high versatility and scalability and will allow for expanding project results beyond the field of remote medicine.
The project will develop and integrate two categories of **intelligent interfaces**: 1. specific to signal **acquisition** from sensors placed on the patient and 2. **communication** – dedicated (by wire or wireless) necessary for warning/alert messages transfer and also for data transfer to the hospital hub. Remote data-transmission will allow for communication technologies, like: Near Field Communication (RFID, ZigBee, RuBee, Bluetooth), remote wireless: GSM/GPRS, EDGE, UMTS, Wi-Fi, WiMax as well as the wire based ISDN and Ethernet.
The project is relevant to research direction *"1 – Information and communication Technology"*, theme priority: "*1.6. Technologies for distributed systems and embedded systems",* aimed at developing of new technologies for integrated systems based on biomedical sensors networks (specific objective 1.6.14). The project objectives envisage also the development of applications for communication and computing embedded systems (specific objectives 1.6.17 and 1.16.16) ensuring local data processing and transmission to the hospital hub.
The purpose is to develop new technologies for integrated systems based on intelligent sensor networks for monitoring biological signals, remote transmission and processing for prevention and diagnosis. Envisaged are both theory development of architecture and organization of the systems for intelligent sensor networks (wire based or wireless) as well as practical implementation and testing of the mobile monitoring system carried by the patient. The proposal has innovative characteristics: the architecture and organization; the „plug&play" interfaces in compliance with the IEEE 1451 standard; the integration based on widespread platforms (PDA, MP); processing, analysis and detection of alerts using also „artificial intelligence" methods, development of strategies allowing for high reliability of the data link with the hospital hub, all these are characteristics of a modern and extremely useful solution for the developments in

the field of bioengineering. The project will create the conditions for radically improved material bases required for the monitoring of the main biological parameters of the patient in the ambulatory which will increase the efficiency of the medical art, especially prevention, reduce the costs of medical assistance and extend the experimental base, very necessary in the field. Also, the formative component, especially by integrating young researchers in a field with real prospects contributes to the relevance of the project.

MAIN ACTIVITIES:

- Analysis of the current world wide developments in the field of ambulatory monitoring of biological parameters acquired signals of processing techniques and methods, instrumentation and dedicated sensors. The stress will be laid on advanced signal processing techniques for preventing or early detection of the patient's health state deterioration;
- Definition of the full specifications – hardware and software for the monitoring application;
- Development of system architecture and organization, adequate for monitoring;
- Design of acquisition and communication interfaces at MCE in accord with the specification including those regarding energy consumption minimization;
- Development of acquisition, processing, analysis, storage/archiving, alert and communication MCE programs with the hub for the acquired signals;
- Training of the young researchers, result dissemination and increase of team visibility for attracting new partners and creating accession conditions to European funds;
- Development of the material research bases of the partners and subsequently of interdisciplinary research laboratories: electronics, medicine, telecommunication in the four university centers. It is envisaged that these will function financially autonomous which will allow for the permanent updating of the proposed system.

3. PNCD II project nr. 3598 / 2007 "Efficiency Increasing of the Support Processes for International Transfer on Managerial Know-How in the Applicative Research and Innovation Field" WINMAN

Director: Prof.dr.eng. Radu VASIU
Value 2009: 53.200 RON
Members: Assoc.lect.eng. Diana ANDONE
Lect.dr.eng. Mugur MOCOFAN
Lect.dr.eng. Marian BUCOS
Assist.eng. Mihai ONITA
PhD student Iasmina ERMALAI
PhD student Andrei TERNAUCIUC
PhD student Cristian TECU
PhD student Bogdan DRAGULESCU
Partners: Academy of Economic Studies
Institute of National Economy
"Politehnica" University of Bucharest
Centre for Industries and Services Economy
Bridgeman SRL
Commercial Academy Satu Mare
Artifex University

FIELD AND GRANT DESCRIPTION:

The coherent contribution to the triangle competitivity – technological transfer – research-innovation supposes the elaboration of new methods and processes for knowledge management for the research activities. The recognition of the role of technology transfer mechanisms and / or of the know-how elements are more an more underlined by the academic areas, by the partnerships between research – industry – financial services companies. The role of the new technologies in improving the productivity and the competitivity of different economical sectors / economic clusters / or even national economies takes to the reconfiguration of the traditional relations between the research results suppliers and the final beneficiaries of those results. The XXI-st century Romania is still characterized by significant gaps regarding the technical efficiency, delays and disfunctionalities in resource administration for the adoption of new technologies in the industry. It is absolutely necessary to correlate, on short term, the requirements related to the increase of the absorbtion capacity of the European founds and the necessity to increase economic performance. Consequently, new decision making models are required, to the benefit of the industrial companies in the field of human resources development for Romania as a whole.

The consortium of the WINMAN project has the purpose to elaborate and to propose models for managerial processes and practical methods related to different aspects of the research activities: managerial transformation based on innovation strategies, technological transfer as support for knowledge based developments, intellectual property rights implementation in the research strategy, innovation support as source of competitivity advantages, human resources management in R&D activities.

MAIN ACTIVITIES:

- Analysis of the risk factors in the evolution of the international technology transfers, especially at the level of small and medium enterprises in Romania;
- Realization of new models for the technology transfer processes in the field of international know-how management, according to the specific Romanian conditions (business intelligence)
- Re-engineering of the processes related to Intellectual Property, with the goal to involve universities as main actors in the field
- Creation of an intuitively and interactiv instrument on the web (e-business portal), able to support the use of the models of international know-how management
- Initiation of new collaborative business processes in the field of technological transfers, able to stimulate innovation in Romania.

PUBLICATIONS

BOOKS

1. Radu Vasiu, Corneliu Toma, Diana Andone, *Amintiri despre Multimedia/ Memories of Multimedia*, Ed. Politehnica, Timisoara, 2009, 110 pp, ISBN 978-973-625-965-4
2. Radu Vasiu, Diana Andone, *ViCaDiS – Virtual Campus for Digital Students. Set of Guidelines*, Ed. Politehnica, Timisoara, 2009, 146 pp, ISBN 978-606-554-061-3

PAPERS

1. Diana Andone, Mark Frydenberg, *Two Screens and an Ocean: Collaborating Across Continents and Cultures with Web-Based Tools*, International Conference ISECON "Information Systems Educators", Washington DC, USA, Nov. 2009, CD version, paper 3162, ISBN 1542-7382, *2009 Distinguished Paper Award*
2. Diana Andone, Jon Dron, Lyn Pemberton, *Developing a Desirable Learning Environment for Digital Students*, Journal of Technology, Instruction and Learning (TICL), vol. 6, no. 4, 2009, pp. 253-271, ISSN 1540-0182
3. Mark Frydenberg, Diana Andone, *Engaging Digital Students in Global Learning: A Conversation in Multimedia, Technology and Culture*, IADIS International Conference e-Learning 2009 (part of MCCSIS 2009), 17-23 June 2009, Algarve, Portugal, pp. 73-80, ISBN 978-972-8924-83-6
4. Diana Andone, Mark Frydenberg, *One Idea, One Ocean, Two Countries and Tens of Students*, IADIS International Conference "Cognition and Exploratory Learning in Digital Age" CELDA 2009, 20-22 Nov. 2009, Rome, Italy, pp. 388-391, ISBN 978-972-8924-95-9
5. Iasmina Ermalai, Radu Vasiu, *Study Cases on Specific LMSs Used in Romania and Worldwide*, 13th WSEAS International Conference on Communications, 23-25 July 2009, Rodos, Greece, pp. 111-116, ISBN 978-960-474-098-7
6. Iasmina Ermalai, Mugur Mocofan, Mihai Onita, Radu Vasiu, *Adding Semantics to Online Learning Environments*, 5th International Symposium on Applied Computational Intelligence and Informatics – SACI 2009, 28-29 May 2009, pp. 569-573, ISBN 978-1-4144-4478-6
7. Diana Andone, Mark Frydenberg, *Are Digital Students Learning the Same on Both Sides of the Ocean?*, AACE World Conference on E-Learning in Corporate, Government, Healthcare & Higher Education, E-Learn 2009, 26-30 Oct. 2009, Vancouver, Canada, pp. 819-826, ISBN 1-880094-76-2
8. Radu Vasiu, Diana Andone, Nicolae Robu, *Interactions in CSID Online Learning Environment*, AACE World Conference on E-Learning in Corporate, Government, Healthcare & Higher Education, E-Learn 2009, 26-30 Oct. 2009, Vancouver, Canada, pp. 3734-3739, ISBN 1-880094-76-2
9. Diana Andone, Radu Vasiu, *How a Virtual Campus for Digital Students (ViCaDiS) Should*

Be?, AACE World Conference on E-Learning in Corporate, Government, Healthcare & Higher Education, E-Learn 2009, 26-30 Oct. 2009, Vancouver, Canada, pp. 827-832, ISBN 1-880094-76-2

10. Radu Vasiu, Diana Andone, Nicolae Robu, *Ideas and Concepts of ViCaDiS – A Virtual Campus for Digital Students*, IADIS International Conference "Cognition and Exploratory Learning in Digital Age" CELDA 2009, 20-22 Nov. 2009, Rome, Italy, pp. 235-242, ISBN 978-972-8924-95-9
11. Vasile Gui, Catalin Căleanu, *On the effectiveness of multiscale mode filters in edge preserving image filtering*, 13th Multiconference on Circuits, Systems, Communications and Computers, pp. 190-196
12. Simion G., Gui V., Otesteanu M., *A New Compositional Technique for Hand Gesture Recognition*, 13th WSEAS International Conferece on Computers, Rhodes, Greece 2009, pp. 400-405, ISBN 978-960-474-099-4, ISSN 1790-5109
13. Florin Alexa, Vasile Gui, Catalin Caleanu, Ciprian David, *Fast contour extraction*, 8th WSEAS International Conference on Circuits, Systems, Electronics, Control & Signal Processing (CSECS'09) Tenerife, Canary Islands, Spain, December 14-16, 2009, pp. 232-235, ISSN 1790-5117
14. Ciprian David, Vasile Gui, Florin Alexa, *Foreground/background segmentation with learned dictionary*, 3rd International Conference on Circuits, Systems and Signals (CSS'09), pp. 197-201, ISSN 1790-5117, ISBN 978-960-474-147-2
15. Fuiorea Daniela, Gui Vasile, Pescaru Dan, Toma Corneliu, *Kernel based image registration versus MLESAC: a comparative study*, Proceedings of the 5th International Symposium on Applied Computational Intelligence and Informatics, SACI 09, Universitatea "Politehnica", Timişoara, 20 May 2009, pp. 200-206, ISBN 1-4244-1234-X
16. D. Lacrămă, F. Alexa, *Optimises homomorpic structuring element for handwriting characters skeleton*, 8th WSEAS International Conference on Computational Inteligence, Man-Machine systems and cybernetics (CIMMACS'09) Puerto de la Cruz, Tenerife, Canary Islands, Spain, December 14-16, 2009, pp. 164-167, ISSN 1790-5117
17. Negrea, R., Eckstein, A., Alexa, F., *Fixed point technique for a class of nonlinear systems and application to stochastic resonance*, 14th WSEAS International Conference on Applied Mathematics (MATH'09) Puerto de la Cruz, Tenerife, Canary Islands, Spain, December 14-16, 2009, pp. 323-327, ISSN 1790-2769
18. Iasmina Ermalai, Diana Andone, Radu Vasiu, *Study Cases on eLearning Technologies Used by Universities in Romania and Worldwide*, WSEAS Transactions on Communications, vol. 8, nr. 8, pp. 785-794, ISSN 1109-2742
19. Simion G., Gui V., Otesteanu M., A *Compositional Technique for Hand Gesture Recognition: New Results*, WSEAS TRANSACTIONS on COMMUNICATIONS, Issue 8, vol 8, 2009, pp. 805-821, ISSN 1109-2742
20. Simion G., Gui V., Otesteanu, M., *Hand Gesture Recognition Using Compositional Techniques*, 5th International Symposium on Applied Computational Intelligence and Informatics (SACI 2009), pp. 435 - 440, ISBN 978-1-4244-4477-9
21. Ioaneşiu Mirela, Toma Corneliu, *Optimization of SIP session setup delay for VOIP in 3G wireless networks*, The 4th International Conference on Enginnering Technologies, ICET 2009, University of Novi Sad, Novi Sad, Serbia, 28-30 April 2009, pp. 379-385, ISBN 978-86-7892-161-2
22. Ioaneşiu Mirela, Toma Corneliu, *Support of Voice services in IEEE 802.11 wireless LANs*, The 4th International Conference on Enginnering Technologies, ICET 2009, University of Novi Sad, Novi Sad, Serbia, 28-30 April 2009, pp. 367-376, ISBN 978-86-7892-161-2
23. Onita Mihai, Ermalai Iasmina, Ternauciuc Andrei, Dragulescu Bogdan, *Media Streaming in Higher Education*, Iadis International Conference, "Cognition and Exploratory Learning in Digital Age", CELDA 2009, Rome, Italy, 20-22 November, pp. 373-377, ISBN 978-972-8924-95-9
24. Mihai Onita, Andrei Ternauciuc, Bogdan Dragulescu, Iasmina Ermalai, *Streaming Solutions at UPT*, The 5th International Scientific Conference, ELSE - E-Learning and Software for Education, Bucuresti, 9 - 10 April 2009, pp. 151-157, ISSN 2066-026X
25. Andrei Ternauciuc, Bogdan Dragulescu, Mihai Onita, Radu Vasiu, *Single Sign - On Solutions for Moodle*, International Conference "eLearning and Software for Education" ELSE 2009, 9-10 April 2009, Bucharest, pp. 217-224, ISBN 978-973-663-717-9.

PhD RESEARCH ACTIVITIES

1. *Prof. dr. eng. Corneliu I. TOMA*

PhD students:

- Ionel STANCIU: *Multimedia Communications Over Wireless Networks*
- Andreea GĂLEANU: *Contributions at the performance improvement of the GSM system*
- Artur MULLER: *Contributions in implementing of the multimedia databases, with local and remote access*
- Mirela L. IOANEŞIU: *Contributions at the network security by the using of the virtual private networks (VPN)*
- 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.*
- Florin-Josef LĂTĂREȚU: *Contributions at the intelligent telecommunication network achievement.*
- Alin SCOROŞANU

2. Prof. dr. eng. Marius Oteşteanu

PhD students:

- Daniel POPA, *Urmărirea obiectelor în secvențe video*
- Ion-Cosmin DITA, *Detecția şi recunoasterea codurilor matriceale*
- Horia MUNTEAN, *Rețele de comunicații mobile 4G*
- Pross Wolfgang (Germania), *Codarea pentru corecția erorilor la coduri matriceale*

3. Prof. dr. eng. Radu VASIU

PhD students:

- Artur SRAUM, *Contributions to Interactive Web Programming*
- Cristian TECU, *Contributions to the Use of Video, Photo and Audio Applications in Professional Presentations*
- Andrei TERNAUCIUC, *Contributions to the Realization of Personalised Learning Environments*
- Virgil ROTARU, *IT Applications for e-Government Systems*
- Bogdan DRAGULESCU, *Contributions to the Realization of e-Learning Platforms' Interoperability*
- Andrei RUSAN, first year student
- Michaela CALOTESCU, first year student
- Daniel IVANC, first year student
- Adrian POPESCU, first year student
- Mohamed KUSAY, first year student
- George MULEC

PHD THESIS SUSTAINED

- Kay Erik BOENKE (Germania), *Hierarchical object localization for robotic bin picking*, PhD advisor: Prof. dr. eng. Marius OTEŞTEANU
- Daniela Narcisa FUIOREA – BULUCEA: *Tehnici de aliniere a imaginilor utilizând estimare neparametrică de densitate de probabilitate*, PhD advisor: Prof. dr. eng. Corneliu TOMA
- Mircea TOMOROGA: *Contributions at the conception and design of the analogue integrated circuits in CMOS technology*, PhD advisor: Prof. dr. eng. Corneliu TOMA and Prof. dr. eng. Mircea CIUGUDEAN
- Georgiana SÂRBU-DOAGĂ, *A Compositional Approach to Hand Gesture Recognition*, PhD advisor: Prof. dr. eng. Marius OTEŞTEANU
- Iasmina ERMALAI, *Contributions to the Use of New Information Technologies in e-Learning*, PhD advisor: Prof. dr. eng. Radu VASIU

RESEARCH TEAM

- Prof. dr. eng. Corneliu TOMA: *Television, Analogue Electronics, Image Compression, Motion Analysis, Pattern, Recognition, Multimedia Technologies*;
- Prof. dr. eng. Marius OTEŞTEANU: *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*;
- prof. dr. eng. Florin ALEXA: *Image and Sound Processing*;
- Lect. dr. eng. Mugur MOCOFAN: *Machine Vision and Pattern Recognition, Multimedia, Studio Equipment, Video Production*;
- Assoc. lect. dr. eng. Diana ANDONE: *Multimedia Applications, E-learning, Adaptive and Adaptable Technology, Media Research*;
- Assoc. lect. eng. Daniel HAIDUC: *Computer Graphics, Animation Techniques*;

- Assist. eng. Constantin Marian BUCOS: *Multimedia Databases, Object Oriented Programming*;
- Assist. eng. Mihai ONITA: *Audio-video Compression, Digital Television, Multimedia Applications.*

Contact Person

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

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GENERAL PRESENTATION

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

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 TO 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. 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*
- Assoc. prof. 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.

GRANTS AND CONTRACTS

1. *Platform for the Study of Electrical, Electronical and Chemical Concurent Phenomena that Occur in the Thermo-Solar Conversion Process and in the Photo-Voltaic Effect. Automation of Functioning and Exploitation of Solar Assets Based on Thermo-Solar and Photo-Voltaic Conversion*

Granted by the Ministery of Education and Research
Director: Prof.dr.eng. Nicolae ROBU, Rector of the "Politehnica" University
Chief of the Electronics Laboratory: Prof.dr.eng. Aldo DE SABATA
Duration: three years, 2006-2008
Total value: 4.232.764 RON

PROJECT OUTLINE

Researches on the use of new sources of energy and quality of the environment are developing at a high pace in the European Union in the present. For example, a 5,5 million EURO Energetically Independent Solar House has been built in Germany, at Freiburg. In all countries of the EU, an intense campaign is directed for drawing attention and education of the public on energy problems such as decrease of home and industrial consumption and economy of classical energy resources.
In order for the know-how and experience gained at the "Politehnica" University of Timisoara in the field of alternate sources of energy to be effectively applied, it is necessary to educate students and staff in solar techniques. In this way, our research in this inter- and multi-disciplinary field can be further developped, by taking advantage of oportunities provided by accessing the European Union.
Th efficiency of solar pannels varies between 30 and 50%, and it is considered good, the efficiency of photovoltaic pannels is between 9 and 24%, and it is considered satisfactory, the efficiency of thermal stocking is about 60%, the efficiency of electrical stocking is approximately 80%. The efficiency of stocking as hydrogen reaction heat is larger than 96%, and the efficiency of nanostructured cells is about 4%.
Consequently, it is necessary to create diatherman materials with very high transmittance in the visible domain, atherman materials with very high absorbtion properties on a large wavelength spectrum, insulating materials with very low thermal conductivity, selective layers, antireflection layers and semiconductor materials with efficiency of 30%, nanostructured cells with efficiency of about 12%.
The "Politehnica" University of Timisoara has built its Solar House as an energetic system in 1982-1986. The asset, built by self funding, has been designed by specialists from the Civil Engineering Faculty, and it contains two floors and underground. The best construction materials that could be found at that time have been used, in order to minimize thermal losses.
We want to create a platform of five integrated, electronically connected laboratories around the Solar House, at five faculties: Energetics, Automatics, Electronics, Architecture and Civil Engineering, and Physics. The purpose is to create, study, and measure new materials, measure solar radiation in our region, design new structures of solar architecture, find new ways of thermal and electrical stocking of solar energy, design and built home and industrial solar energy systems. We propose to introduce new subjects for license, master, and doctoral students.
These objectives can be realized by the rehabilitation of the Solar House and of its energetic chain based on thermo-solar conversion and photo-voltaic effect, by the creation and connection of the five laboratories, and acquisition of modern equipment.

The University might have financial benefits by providing spectro-photometric measurements and customized solar design.
We can introduce now 12 new license laboratory subjects, e.g. *Solar Energy Supplied Electrolysis.* We can introduce at this moment 14 master laboratory subjects, e.g. *Study of an Integrated Thermal-Photovoltaic System*. For the PHD school we can introduce now 4 themes, e.g. *Complete Analysis of the Energy Chain in a Photovoltaic Pannel*. We have now 13 research subjects pending by lack of financement, e.g. *Creation of New, High Transmittance Materials*. We have 12 new chapters to be introduced for the master/PHD school.
The Platform facilities will be used for research, design of solar systems and buildings, publishing of books and papers in journals, organization and participation at national and international conferences and exhibitions, license, master, and doctoral schools on alternative sources of energy, public demonstrations, home and industrial solutions and design.

2. *Partnership grant for projects execution Nr.3/21039/2007, Researches concerning the elaboration and promotion for solar architectural solar solutions for PV systems integrated in buildings.* (PASOR)
Director: Prof.dr.eng. Traian JURCA
Finance: State Budget – Education, Research and Young Ministery, Partnership Programs in Prioritary Domains
Value: 360.000 RON (49.551 RON on 2009)
Members: Prof.dr.ing. Ignea Alimpie,
Prof.dr.ing. DeSabata Aldo
Prof.dr.ing. Stoiciu Dan
Prof.dr.arhitect. Bica Smaranda
Assoc. prof. dr. eng. Lascu Mihaela
Assoc. prof. dr. eng. Mischie Septimiu
Lector dr. Luminosu Ioan
Assist. prof. eng. Matiu Liliana
Assist. prof. eng. Dughir Ciprian
Assist. arh. Silvasan Claudiu
Assist. arh. Oprita Razvan
Lector dr. eng.Pazsitka Robert
Assist. prof. eng. Vasiu Gabriel
Assist. prof. eng. Iftode Cora
Duration: 36 months
Contractor: Trading Society for Research, Design and Equipment Production and Automatization
Partner P3: Politehnica University of Timisoara

FIELD AND GRANT DESCRIPTION

The major purpose of the project is to demonstrate the efficiency of integrating various PV elements in buildings, to test them and to make them known so that they can be used on a large scale. At the same time, the project will provide the architects and the PV community in general with advanced planning tools.

ACTIVITIES AND RESULTS

1. Development of surveys and solution analyses on the technical aspects of solar photovoltaic architecture in Romania;
2. Research, measurements and technical solutions for pilot integrated PV system installations, including: setting up meteorological parameters measurement centres (in Timisoara); sizing integrated PV systems and preparing the technical documentation; planning and monitoring the integrated PV systems (a dedicated software); developing the project website (http://solar.physics.uvt.ro/srms/)
3. Implementing and testing demonstrative/ experimental integrated PV systems; Analysing the monitored parameters;
Designing models in order to calculate irradiation in tilted surfaces.

Contact person: Traian Jurca
E-mail: traian.jurca@etc.upt.ro

3. Contract *19496/18.11.08 Study of the renewable energy potential in the Department of Timiş,* in the framework of *PHARE CBC RO-HU 2006, contract RO-2006/018-446.01.01.01.07*
Value: 17.017 RON
Members of the research group:
Prof. Dr. Eng. Aldo De Sabata, director
Prof. Dr. Eng. Ivan Bogdanov

FIELD AND GRANT DESCRIPTION

A document containing requirements for a correct evaluation of renewable energy potential in the Department of Timiş have been devised. This work has been performed for the Town of Jimbolia Mayor's office, under the PHARE CBC Ro-Hu 2006, contract RO-2006/018-446.01.01.01.07.

ACTIVITIES AND RESULTS

The document has been used for the selection between the participants to a public bid. The winner has been Fraunhofer AG, Germany, and the results of the evaluation have been published.

Contact person: Aldo De Sabata
aldo.desabata@etc.upt.ro

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. 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 magnetooptic and piezoelectric sensors. An I^2C interface has been experimented.

RESEARCH TEAM

- Prof.dr.eng. Sever CRIŞAN: *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

1. COST 2100 International Program

Prof. Dan STOICIU is representative of the "Politehnica" University of Timişoara.

PhD RESEARCH ACTIVITIES

1. Scientific Supervisor: Prof. dr. eng. Alimpie IGNEA

PhD students:

- Liliana STOICA: *Contributions to Digital Signal Processing*
- Ciprian DUGHIR: *Contributions to anntenas calibration*
- Cristina VĂLIU: *Contributions to the nonlinearities study of high-frequency circuits*
- Cora IFTODE: *Electromagnetic field effects on living organism*
- Gabriel GĂŞPĂRESC: *Perturbation monitoring in electrical networks*
- Adrian MIHĂIUŢ: *Contributions in anntenas calibration*
- Doru Lucian COCOŞ, *Neural Networks and Fuzzy Logic applications to electronic meter calibration*
- Teodor PETRIŢA, *Contributions to radiofrequency disturbances monitoring*
- Michael Kleinkes (Germany): *Mathematical analysis of off-line programmed robots in industrial application cells monitoring.*

PHD THESIS SUSTAINED

- Michael Kleinkes (Germany), *Mathematical analysis of off-line programmed robots in industrial application cells monitorings,* PhD advisor: Prof. dr. eng. Alimpie IGNEA

PUBLICATIONS

BOOKS

1. Jurca Traian, *Măsurări electrice şi electronice*, "Politehnica" Publishing House, Timisoara, 2009, 107 pages, ISBN 978-606-554-028-6 (published in Romanian)
2. Vârtosu Adrian, *Tehnica frecvenţelor înalte*, Manual pentru studenti, "Politehnica" Publishing House, Timisoara 2009, 139 pages (published in Romanian).

PAPERS

1. D. Belega, S. Zaporojan, *Assessment of Influence of Systematic Errors on the Precision with which the Normalized Frequency of a Sinusoidal Signal is Determined by Means of a Discrete Fourier Transformation with Interpolation*, Measurement Technique (translated from Izmenitel'naya Tekhnika) vol. 52, no. 2, pp. 148-154, ISSN 0543-1972, 2009
2. D. Belega, D. Dallet, *Multifrequency Signal Analysis by Interpolated DFT Method with Maximum Sidelobe Decay Windows*, Measurement vol. 42, no. 3, pp. 420-426, ISSN 0263-2241, 2009
3. D. Belega, D. Dallet, *Amplitude Estimation by a Multipoint Interpolated DFT Approach*, IEEE Transactions on Instrumentation and Measurement, vol. 58, no. 5, pp. 1316-1323, ISSN 0016-9456, 2009
4. D. Belega, D. Dallet, *Choice of the Acquisition Parameters for Frequency Estimation of a Sine Wave by Interpolated DFT Method*, Computer Standards & Interfaces, vol. 31, no. 5, pp. 962-968, ISSN 0920-5489, 2009

5. Daniel Belega, Dominique Dallet, Dan Stoiciu, *Choice of the Window Used in the Interpolated Discrete Fourier Transform Method*, Revue Roumaine des Sciences Techniques Serie Electrotechnique et Energetique, vol. 54, no. 4, pp. 365-374, ISSN 0035-4066, 2009

6. Liviu Toma, Aldo De Sabata, Robert Pazsitka, *Iterative procedure for real single-tone frequency estimation*, Revue Roumaine de Sciences Techniques, Serie Electrotechnique et Energétique, vol. 54, 3, pp. 253-260, ISSN 0035-4066, 2009

7. D. Belega, D. Dallet, *Multipoint Interpolated DFT Method for Frequency Estimation*, Proceedings of the IEEE 6th International Multi-Conference on Systems, Signals, and Devices, Djerba-Tunisia, March 23-26, 2009, pp. 1-6, ISBN 978-1-4244-4345-1

8. D. Belega, D. Dallet, D. Slepicka, *Accurate Amplitude Estimation of a Sine-Wave Harmonic Component by Frequency-Domain Approach*, Proceedings of the I2MTC IEEE International Instrumentation and Measurement Technology Conference, Singapore, May 5-7, 2009, pp. 1315-1320, ISSN 0018-9456

9. D. Belega, D. Dallet, D. Petri, *Uncertainty Analysis of the Normalized Frequency Estimation by Multipoint Interpolated DFT Approach*, Proceedings of the IEEE Workshop on Advanced Methods for Uncertainty Estimation Measurement (AMUEM), Bucharest, Romania, July 6-7, 2009. pp. 34-38, ISBN 978-1-4244-3593-7

10. Daniel Belega, Dominique Dallet, *Efficiency of the Three-Point Interpolated DFT Method on the Normalized Frequency Estimation of a Sine-Wave*, Proceedings of the IEEE Workshop on Intelligent Data Acquisition and Advanced Computing Systems: Technology and Applications (IDAACS), Rende (Cosenza), Italy, September 21-23, 2009, pp. 13-17, ISBN 978-1-4244-4882

11. Gabriel Găşpăresc, Modeling *Algorithms for Sags with Exponential Fronts and Other Types of Electromagnetic Disturbances from Power Supply Network*, 2009 IEEE Bucharest PowerTech, ISBN 978-1-4244-2235-7

12. D. Belega, D. Dallet, *Accurate ADC Dynamic Testing by Means of the Three-Parameter Sine-Fit Algorithm*, Proceedings of the 15th IEEE-International Mixed-Signals, Sensors, and Systems Test Workshop (IMS3TW), pp. 1-6, Scottsdale, Arizona, USA, June 10-12, 2009, pp. 1-6, ISBN 978-1-4244-4618-6

13. Adrian Mihaiuti, Alimpie Ignea, *Concentration Ellipse, a Statistical Method to Analyse Radio Communications Analyse Radio Communications Measurement – Prediction Pair Data*, Proceedings EuCAP 2009, 3rd European Conference on Antennas and Propagation; 23-27 March 2009, Berlin, Germany, 4 pp., ISBN 978-1-4244-4753-4

14. Dughir Ciprian Vartosu Adrian Prostean Gabriela Voicu Groza, *Quality Monitoring of Electrical Power Distribution Network Using a Low-power Microcontroller*, Proceedings of the 2009 IEEE Electrical Power & Energy Conference, October 22-23, 2009, Montreal, Quebec, Canada, ISBN 978-1-4244-4509-7

15. A. De Sabata, L. Toma, *Analysis of an Algorithm for Real Tone Frequqency Estimation*, Proc. of the Int. Symp. on Signals, Circuits and Systems ISSCS 2009, July 9-10 2009, vol. 1, pp. 113-116, IEEE Catalog Number CFP09816-PRT, ISBN 978-1-4244-3784-9

16. A. De Sabata, L. Toma, *Application of Bandpass Filtering in Real Tone Frequency Estimation*, 5th International Symposium on Applied Computational Intelligence and Informatics, May 28–29, 2009, Timişoara, Romania, pp. 429-433, IEEE Catalog Number: CFP0945C-CDR, ISBN 978-1-4244-4478-6

17. Ioan Luminosu, Aldo De Sabata, Coleta De Sabata, *Thermally Autonomous Residence in the Western Part of Romania*, 5th International Symposium on Applied Computational Intelligence and Informatics, May 28–29, 2009 – Timişoara, Romania, pp. 229-234, IEEE Catalog Number: CFP0945C-CDR ISBN 978-1-4244-4478-6, Library of Congress: 2009903350

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19. Pavol Bauer, Dan Lascu, Mihaela Lascu, Viorel Popescu, Dan Negoiţescu, Mircea Băbăiţă, Adrian Popovici, *E-learning Practical Teaching of Uncontrolled Rectifiers*, EPE 2009, 8-10 September, Barcelona, 13th European Conference on Power Electronics and Applications, P1-P10, ISBN 978-9-0758-1150-09

20. Ioan Luminosu, Coleta De Sabata, Aldo De Sabata, Traian Jurca, *On the use of magnetic*

fluids in solar energy installations, Buletinul AGIR anul XIV, nr. 2-3, pp. 66-69, aprilie-septembrie 2009, ISSN 1224-7928

21. Coleta De Sabata, Ioan Luminosu, Aldo De Sabata, Traian Jurca, *On the use of magnetic fluids in solar energy installations*, Buletinul AGIR anul XIV, nr. 2-3, pp. 70-75, aprilie-septembrie 2009, ISSN 1224-7928
22. Gabriel Găşpăresc, *Virtual Instrument for ECG Signals Generation and Filtering*, Annals of the University of Craiova, Series: Automation, Computers and Mechatronics 6(33), nr.1, 30, ISSN 1841-0626
23. C. De Sabata, I. Luminosu, A. De Sabata, T. Jurca, *Summer Climatization Based on Solar Energy: Considerations and Experimental Results*, Bul. St. Univ. "Politehnica" din Timisoara, Trans. on Mechanics, Tom 53(67), Fasc. 3, pp. 65-68, ISSN 1224-6077
24. Vartosu Adrian, Dughir Ciprian, *The electric properties for biological structures in the case of mobile telephony*, Annal of Univesity of Craiova vol. 6, 6 pp., ISSN 1841-0626
25. Daniel Belega, Dominique Dallet, *Accurate Normalized Frequency Estimation by the Three-Point Interpolated DFT Method with Rectangular Window*, 17th European Signal Processing Conference (EUSIPCO), Glasgow, Scotland, August 24-28, 2009, EUSIPCO 2009 Proceedings, pp. 1329-1333
26. Daniel Belega, Dominique Dallet, *Fast and Accurate Measurement of the rms Value of a Noncoherent Sampled Sine-Wave*, XIX IMEKO World Congress Fundamental and Applied Metrology, Lisbon, Portugal, September 6-11, 2009, IMEKO Proceedings pp. 792-796, ISBN 978-963-884190-0-1
27. Daniel Belega, Ciprian Dughir, *Acquisition Signals from Electromagnetic Field-Meters Using Digital Multimeters with Event Logging Mode*, XIX IMEKO World Congress Fundamental and Applied Metrology, Lisbon, Portugal, September 6-11, 2009. IMEKO Proceedings, pp. 2188-2192, ISBN 978-963-884190-0-1
28. Septimiu Mischie Liviu Toma, *On Using Kullback Leibler Distance to Estimate Vector Quantization Performance*, Recent Advances in Signals and Systems, Proceedings of the 9-th WSEAS International Conference on Signal, Speech and Image Processing, Budapest 3-5 sept. 2009, pp. 96-101, ISBN 978-960-474-114-4, ISSN 1790-5109
29. Aldo De Sabata, Ladislau Matekovits, Andrei Silaghi, Ulrich Rohde, Marius Silaghi, *Investigation on surface waves related properties of some periodic structures, Conference on Microwave and High Frequqency Heating*, Proceedings of the 12th International Conference on Microwave and High Frequqency Heating, Ampere 2009, 7-10 Sept. 2009, Karlsruhe, Germany, pp. 364-367
30. Ladislau Matekovits, Aldo De Sabata, *Analysis of the gap bandwidth of some high impedance surfaces*, 6th Japanese – Mediterranean Workshop on Applied Electromegnetic Engineering for Magnetic, Superconducting and nano Materials JAPMED'6 July 27-29, 2009, Extended Abstracts Proceedings, Politehnica University of Bucharest: Printech Pub, 2009, pp. 155-156, ISBN 978-606-521-346-3
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32. C. De Sabata, F. Barvinschi, A. De Sabata, I. Luminosu, *Ecological waste water cleaning for swine farms using solar energy*, International UAB – BENA Conference "Management and Sustainable Protection of Environment", Alba Iulia, Romania, 6-7 May 2009, Book of Abstracts, Aeternitas Pub., 2009, pp. 213, ISBN 978-973-1890-30-2
33. T. Jurca, M. Paulescu, A. De Sabata, I. Luminosu, C. Dughir, M. Lascu, E. Paulescu, C. De Sabata, *Recent measurements on solar radiation in Timisoara, Romania*, Unconventional Energies in the Carpathian and Danubian Area, Arad, Romania, 27-28 November 2009, "Technical and Economical Ecology Issues and the Medical and Social Aspects" Abstracts
34. Adrian Mihaiuti, *Statistical characterisation of the radio channel measurements in mobile communications*, The XIth International Symposium Young People and Multidisciplinary Research, 12-13 November 2009, Timisoara, 4 pp., ISSN 1843-6609
35. Adrian Mihaiuti, Alimpie Ignea, *The influence of the mobile communications receiver antenna height in the urban propagation scenario*, Doctor Etc 2009, 24-25 septembrie 2009, Timisoara, Lucrarile din sesiunea de comunicari stiintifice "Doctor ETc 2009", pp. 67-70, ISSN 2066-883x