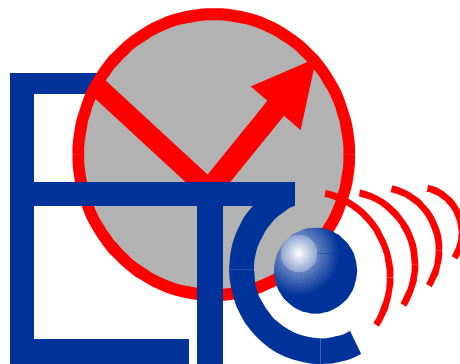# FACULTY OF ELECTRONICS AND TELECOMMUNICATIONS ENGINEERING

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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. Identification 88 / 25.06.2010

Titlu: *Advanced PSICE Modeling and Simulation*
Value: 4200 Euro + VAT (all on 2010)
Director: Aurel GONTEAN
Members: Ioan LIE, Marius RANGU

FIELD AND GRANT DESCRIPTION

Simulation strategies; custom modeling; datasheets constraints

ACTIVITIES AND RESULTS
The customer (Honeywell Safety Romania) received all the required knowledge.

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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. **Identification number**: PN II, CAPACITATI, Modul III, proiecte de cercetare bilaterale, România-China, cod 39-5/2008, nr. contract ANCS 222/15.04.2009

Title: Research on Emotional Facial Expression recognition in Complicated Environment

Value: 29 304 lei Total (18 755 lei on 2010)
Director: Conf. dr. ing. Cătălin-Daniel CĂLEANU, *Members:* Prof. dr. ing. Radu VASIU, Prof. dr. ing. Virgil TIPONUȚ, Prof. dr. ing. Vasile GUI, Prof. dr. ing. Florin ALEXA, Conf. dr. ing. Corina BOTOCA, Drd. ing. Radu MÎRȘU, Drd. ing. Dan IANCHIȘ, Drd. ing. 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

- **Activities for 2010**:
  Several major face imagery processing topics have been addressed, e.g.:
- an overview of the current state of the art systems/algorithms/methodology was performed;
- data acquisition: some of the experiments were performed using Beihang University facial expression database and with images acquired from real environments with complex backgrounds, large variety of emotional states, occlusions;
- preprocessing: we have employed robust techniques for mean shift segmentation, background estimation, tracking;
- feature extraction: a novel method for facial expression recognition which is robust to facial occlusion has been proposed. The face to be recognized is reconstructed using robust principal component analysis (RPCA), and saliency detection is used on the difference image of reconstructed face and the face to be recognized to obtain the facial occlusion region. For improving the nonlinear alignment performance of Active Appearance Models (AAM), we apply a nonlinear manifold learning algorithm, Local Linear Embedded, to model shape-texture manifold.
- classification: some possibilities regarding the use of novel neural architectures (e.g. Liquid State Machine) for processing the facial expression have been analyzed. Also a reweighted AdaBoost classifier has shown good results with respect some public databases of faces, e.g. JAFFE;
- optimization: we have been proposed the application of the Pattern Search Optimization for feature extraction and classification parameters;
- face expression synthesis: novel model of layered fuzzy facial expression generation has been proposed. A novel layered fuzzy facial expression generation language is also developed for conveniently controlling facial expression generation of virtual agent.

According the initial activities plan, four Chinese researchers had visited Romania between 23 - 30 June, 2009. Mission of the four Romanian researchers in P. R. China took place between 27 April – 06 Mai, 2010.

- **Results for 2010**:
1. YuLi Xue, Xia Mao, C.D. Căleanu, ShanWei Lv., "Layered Fuzzy Facial

Expression Generation of Virtual Agent", Chinese Journal of Electronics, Vol. 19, No.1, pag. 69-74, 2010.

2. 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), vol. 4, no. 36, 2010.

3. X.K. Wang, X. Mao, C.D. Căleanu,"Nonlinear Shape-Texture Manifold Learning", IEICE Transactions on Information and Systems, vol. E93-D, no. 7, pag. 2016-2019, Iulie 2010.

4. C.D. Căleanu, X. Mao, V. Tiponuţ, Y. Xue, "Direct Search as Unsupervised Training Algorithm for Neural Networks", 14th WSEAS International Conference on SYSTEMS , Latest Trends on Systems, Vol. I, pag. 575-579, Corfu Island, Greece ISSN: 1792-4235, ISBN: 978-960-474-214-1, Iulie 22-24, 2010.

5. YuLi Xue, Xia Mao, C.D. Căleanu, Q. Chang, "Layered fuzzy facial expression generation based on sociality, emotion and physiology", Pattern Recognition and Artificial Intelligence, Volume 23, Issue 5, Pages 663-670, ISSN: 1003-6059, http://mssbyrgzn.periodicals.net.cn/default.html, October 2010.

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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 TEAM

Prof.dr.eng. Viorel POPESCU – head of the group
Prof.dr.eng. Tiberiu MURESAN
Assoc.prof.dr.eng. Dan LASCU
Lect.dr.eng. Adrian POPOVICI
Lect.dr.eng. Dan NEGOITESCU
Lect.eng. Mircea BABAITA

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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). (53,345 LEI for 2010)
Director: Lecturer.dr.eng. Marius RANGU
Members: Drd.eng. Daniela Mihet
        Drd.eng. Paul Constantinescu
        Dr.eng. Marian Bucos
        Conf.dr. Romeo Negrea
Partners:

- o SIPS Design SRL, Deva, Romania, Coordinator of project
- o Polytechnic University of Timisoara(UPT), Romania, Partner 1
- o 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.

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PhD RESEARCH ACTIVITIES

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

PhD students
➢ 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*
➢ Daniel IANCHIȘ: *Cercetari privind sistemele de detectie a obstacolelor pentru nevazatori*
➢ Zoltan HARASZY: *Human-machine interfaces using acoustics virtual reality*
➢ Robert LORINCZ: *Driver circuit optimization for BLCD motors*
➢ Radu MARȘU: *Visual information processing using spiking neuronal network*
➢ Sebastian MICUȚ: *Reserch on e-Nose devices*
➢ David CRISTEA: *Universal circuit for biological sensors*
➢ Mihai-Emanuel BASCH: *Neuromorf circuits for obstacle detection*
➢ Teodor-Valentin SANDU: *Research on auditive implants optimization*
➢ Kristian MOZIK: *Biometric methods for person identification*
➢ Mihai POMARLAN: *Dinamic programming for robots moving planning*

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*
➢ Beniamin DRAGOI: *Researches on CMOS Integrated Digital Correlator Conception and Design*
➢ Iosif MUDRA: *Researches on CMOS Integrated Fast Synchronous Comparators*
➢ Bogdan MARINCA: *Ultrasonic Investigation Optimization by Algorithms Implemented in Dedicated Integrated Circuits.*
➢ Andrei PASCA: *Clock signal distribution network*
➢ George ROSU: *Analogue circuits for fuzzy systems*

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 ȘCHIOP: *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*

➢ Ioana-Monica POP: *Contributions to theoretical and experimental study regarding optimization of energy converters from solar power station*

5. Scientific supervisor: *Prof.dr.eng. Aurel GONTEAN*

   PhD students:

➢ Oana-Silvana POPESCU: *Digital modulation with FPGA*

➢ Paul HARFAS: *Wind turbine diagnostics using signal processing*

➢ Mihail-Octavian CERNAIANU: *Intelligent control for wind turbin motors*

➢ Cosmin CIRSTEA: *Wireless sensors networks*

➢ Ruxandra-Ioana RUSNAC: *Algorithms for mobile target detection*

➢ Liviu CRISAN: *Group coportament for mobile robots*

➢ Adrian-Constantin BERINDE: *Neural networks applications in robotics.*

➢ Emilian-Silviou GAVRILA: *Solutions for automotive testing*

6. Scientific supervisor: *Prof.dr.eng. Dan LASCU*

   PhD students:

➢ Mircea GURBINA: *Contributions to nonlinear phenomena study in power converters*

➢ Aurel CIRESAN: *Soft-switching converters with applications in green power processing*

➢ Vasile-Daniel DRAGHICI: *Contributions regarding intelligent driven for power converters*

PHD THESES SUSTAINED

➢ Mircea BĂBĂIȚĂ: *Contributions to improve the quality of absorbed power in a.c.-d.c. power supply*, scientific supervisor Prof.dr.eng. Viorel POPESCU

➢ Benjamin DRAGOI: *Research on the conception and design of sinusoidal oscillators integrated in CMOS technology,* scientific supervisor Prof.dr.eng. Mircea CIUGUDEAN

PUBLICATIONS

BOOKS

1. Cătălin-Daniel CALEANU, Virgil TIPINUT, Aurel FILIP, Valentin MARANESCU, *Electronic Devices*, Politehnica Publishing House, 182 pages, ISBN 978-606-554-042-2

2. Cătălin-Daniel CALEANU, Aurel FILIP, Virgil TIPINUT, *Electronic Devices and Electronic Circuit*, Politehnica Publishing House, 195 pages (published in Romanian), ISBN 978-606-554-160-3

3. Virgil TIPONUT, Ioan GAVRILUT, Alexandru GAVCSADI, *Autonomous Mobile Robots Driven with Artificial Neuronal Networks*, Politehnica Publishing House, 2009, 286 pages, ISBN 978-606-554-167-2 (published in Romanian)

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1. Y. Xue, X. Mao, Caleanu Catalin, ShanWei Lv; *Layered Fuzzy Facial Expression Generation of Virtual Agent*; Chinese Journal of Electronics; Vol. 19, No.1, pp.69-74, ISSN 1022-4653

2. N.D. Trip, S. Lungu, V. Popescu; *Modelling of Switched Mode Fly-back Supply for Engineering Education*; Advances in Electrical and Computer Engineering, 2010, Vol. 10, Nr. 1., pp.100-105, e-ISSN 1844-7600

3. Isar Alexandru, Moga Sorin, Isar Dorina; *Denoising Images using a New Type of Bishrink Filter*; Revue Roumaine des Sciences Techniques - Serie Électrotechnique et Énergétique; 55 (1), pp.59-68, ISSN 0035-4066

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14. Marllene Daneti; *A model based approach for pipeline monitoring and leak locating*; MELECON 2010 - 2010 15th IEEE Mediterranean Electrotechnical Conference ; pp.624-629, ISBN 978-1-4244-5793-9

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24. Szabo R., Gontean Aurel-Stefan, Lie Ioan, Babaita, Mircea; *Comparison between Agilent and National Instruments functional test systems*; 8th International Symposium on Intelligent Systems and Informatics (SISY), 2010 ; pp.87-92, ISBN 978-1-4244-7394-6

25. Gherban-Draut P., Raul Ionel, Gontean Aurel-Stefan, Ioana Ionel; *A new approach for carbon monoxide measurement using virtual instrumentation*; The 6th WSEAS International Conference on ENERGY, ENVIRONMENT, ECOSYSTEMS and SUSTAINABLE DEVELOPMENT (EEESD'10) Selected Topics in Energy, Environment, Sustainable Development and Landscaping; pp.267-271; ISBN 978-960-474-237-0

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37. Roland Szabo, Gontean Aurel-Stefan, Ioan Lie; *Sound Based Coin Recognition and Clapper*; Proceedings of the 16th International Conference on Soft Computing, Brno, Czech Republic; Mendel 2010, pp.509-516, ISBN 978-80-214-4120-0

38. Gavrila S., Gontean Aurel-Stefan; *Greenhouse Energy Balance Modeling Review and Perspectives*; Proceedings of the 10th International IFAC Workshop on Programmable Devices and Embedded Systems, 2010; pp.189-194, ISSN 1474-6670

39. Szabo R., Gontean Aurel-Stefan, Lie I.; *The Oscilloscope as a Digital Display*; Proceedings of the 10th International IFAC Workshop on Programmable Devices and Embedded Systems, 2010; pp.195-200, ISSN 1474-6670

40. Dragoi Beniamin; *Improved First Generation Current Conveyor Based on Self-Cascode Current Mirror*; 18th Telecommunications forum TELFOR 2010, Serbia, Belgrade, November 23-25, 2010; pp.799-802, ISBN 978-86-7466-392-9

RESEARCH INTERESTS

➢ Prof.dr.eng. Mircea CIUGUDEAN: *Conception of Analog Integrated Circuits and their Applications*

➢ Prof.dr.eng. Tiberiu MUREŞAN: *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*

➢ 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.dr.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

RESEARCH PROJECTS

1. CNCSIS IDEI, ID_930, 667/207679/ 19.01.2009, Using Wavelets Theory for Decision Making

Director: Alexandru Isar
Value: 999,000 RON (174998.85 RON on 2010)
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 bandwidth). 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, alternative representations of information are frequently used. 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.

ACTIVITIES AND RESULTS
Selected Publications
(http://www.etc.upt.ro/isprc/publications.html)
ISI Journals
- Advances in Electrical and Computer Engineering,
- Rev. Roum. Sci. Techn.-Electrotechn. et Energ,

IEEE Proceedings
- OPTIM 2010 Conference,
- Communications 2010 Conference,
- ISETc 2010 Conference,
- ECCS 2010 Conference.

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

PUBLICATIONS

BOOKS

1. Ioan Buciu, Ioan Nafornita and Cornelia Gordan; *Facial Expression Synthesis and Animation*; Affective Computing and Interaction: Psychological, Cognitive and Neuroscientific Perspectives; Didem Gokcay and Gulsen Yildirim (Eds.); IGI-Global; 438; 22 personal contributions; ISBN 978-1-61692-892-6

2. Lucaciu Radu; Contributions to development of the optical communications systems with

OCDMA; PhD Thesis (in romanian), Politehnica Publishing House, 140; ISBN 978-606-554-208-2

PAPERS

1. Isar Alexandru, Moga Sorin, Isar Dorina; *Denoising Images using a New Type of Bishrink Filter*; Rev. Roum. Sci. Techn.– Électrotechn. et Énerg.; 55 (1), 2010, pp. 59-68, ISSN 0035-4066

2. Isar Alexandru, Moga Sorin, Isar Dorina; *Denoising SONAR Images Using a Bishrink Filter with Reduced Sensitivity*; Rev. Roum. Sci. Techn.– Électrotechn. et Énerg.; 55 (2), 2010, pp. 181-190, ISSN 0035-4066

3. Firoiu Ioana, Naforniţă Corina, Boucher Jean-Marc, Isar Alexandru; *Searching Appropriate Mother Wavelets for Hyperanalytic Denoising*; Advances in Electrical and Computer Engineering; 10 (4), 2010, pp. 125-128, ISSN 1582-7445

4. Corina Botoca, Razvan Bardan, Mircea Botoca, Florin Alexa; *Prostate Cancer Prognosis Evaluation Assisted by Neural Networks*; WSEAS TRANSACTIONS on COMPUTERS; Issue 2, Volume 9, February 2010, 164-173, ISSN 1109-2750

5. Lucaciu Radu, Mihăescu Adrian; *Deconvolutional OCDMA for Indoor Wireless Optical Communications*; Carpathian Journal of Electronic and Computer Engineering; vol. 3, 2010, pp.53-56, ISSN 1844-9689

6. Marius Oltean, Miranda Nafornita; "*Wavelet OFDM Performance in Frequency Selective Fading Channels*"; Proceedings of IEEE International Conference Communications 2010, Bucuresti, Romania, June 10-12; pp.343-346, ISBN 978-1-4244-6363-3

7. Kovaci Maria, Balta Horia; *Comparing the Performance of Duo-Binary Turbo Codes on Rayleigh Channel*; Proceedings of IEEE International Conference, Optim 2010, Brasov, Romania, vol. IV; pp.953-956, ISBN 1-4244-1545-4

8. Janos Gal, Andrei Campeanu, Ioan Nafornita; *Noncoherent Demodulation of Continouos Phase Modulation Signals using Extended Kalman Filtering*; Proceedings of the 12th International Conference on Optimization of Electrical and Electronic Equipment, 20-22 May, Brasov; p.724-727, ISBN 1-4244-1545-4

9. Firoiu Ioana, Isar Alexandru, Isar Dorina; *A Maximum A Posteriori Approach of Hyperanalytic Wavelet Based Image Denoising in a Multi-Wavelet Context*; Proceedings of the 9th WSEAS International Conference on SIGNAL PROCESSING (SIP '10), Catania, Italy; p.113-119, ISBN 978-0470-29025-5

10. Arvinti Beatrice, Toader Dumitru Costache Marius, Isar Alexandru ; *Electrocardiogram Baseline Wander Removal Using Stationary Wavelet Approximations*; Proceedings of IEEE International Conference, Optim 2010, Brasov, Romania, vol. IV; p.890-895, ISBN 1-4244-1545-4

11. Corina Nafornita, Ioana Firoiu, Dorina Isar, Jean-Marc Boucher, Alexandru Isar; *A Second Order Statistical Analysis of the 2D Discrete Wavelet Transform*; Proceedings of IEEE International Conference Communications 2010, Bucuresti, Romania, June 10-12; p.145-148, ISBN 978-1-4244-6363-3

12. Balta Maria, Nafornita Miranda, Kovaci Maria, Balta Horia; *Designing Convolutional Codes used in Multi-Binary Turbo Codes*; Proceedings of IEEE International Conference Communications 2010, Bucuresti, Romania; p.195-198, ISBN 978-1-4244-6363-3

13. Janos Gal, Andrei Campeanu, Ioan Nafornita; *Kalman Noncoherent Detection of CPFSK Signal*; The 8th International Conference on Communication COMM2010, 10-12 June, Bucuresti; p.65-68, ISBN 978-1-4244-6363-3

14. Stolojescu Cristina, Moga Sorin, Lenca Philippe, Isar Alexandru; *A Wavelet Based Prediction Method for Time Series*; Stochastic Modeling Time Series Techniques and Data Analysis International Conference (SMTDA2010); p.126-133, ISBN 978-988-17012-9-9

15. Marius Oltean, Miranda Nafornita; *Wavelet OFDM Performance in Frequency Selective Fading Channels*; Proceedings of IEEE International Conference Communications 2010, Bucuresti, Romania; p.343-346, ISBN 978-1-4244-6363-3

16. Lucaciu Radu, Mihăescu Adrian, Vlădeanu Călin; *Dynamic OCDMA Coding for Indoor Wireless Optical Communications*; Proceedings of the 8th International Conference on Communications "COMM 2010", Communications Networks and Systems, Bucharest; p.347-350, ISBN 978-1-4244-6360-2

17. M. Mangri, M. Nafornita; *Tracing systems for user&Control-Plan traffic of Packet Core of GPRS-UMTS network*; 2010 Proceedings of the 4th International Workshop on Soft Computing Applications (SOFA), 15-17 July 2010 Arad, p.89 - 94, ISBN 978-1-4244-7985-6

18. M. Mangri, M. Nafornita; *MEGACO Correlation Method*; ICCOM'10 Proceedings of the 14th WSEAS international conference on Communications World Scientific and Engineering Academy and Society (WSEAS) Stevens Point, Wisconsin, USA, 2010; p.252-258, ISBN 978-960-474-200-4

19. Corina Nafornita, Ioana Firoiu, Dorina Isar, Jean-Marc Boucher, A. Isar; *A Second Order Statistical Analysis of the Hyperanalytic Wavelet Transform*; Proceedings of the 9th IEEE International Symposium of Electronics and Telecommunications, ISETC 2010, Timisoara, Romania, November 2010; p.311-314, ISBN 978-1-4244-8458-4

20. Balta Horia, Kovaci Maria, Nafornita Miranda, Balta Maria; *Multi-Binary Turbo-Code Design based on Convergence of Iterative Turbo-Decoding Process*; Proceedings of the 5th European Conference on Circuits and Systems for Communications (ECCSC'10), Belgrade, Serbia; p.240-243, ISBN 978-86-7466-394-3

21. Kovaci Maria, Balta Horia; *Comparing the Performance of Duo-Binary Turbo Codes on Rice Flat Fading Channel*; Proceedings of the 9th IEEE International Symposium of Electronics and Telecommunications, ISETC 2010, Timisoara, Romania; p.217-220, ISBN 978-1-4244-8458-4

22. Andor Ioan Eugen, Ardelean Lucian, Baltă Horia, Kovaci Maria, Oltean Marius, Isar Alexandru; *A Study of the Permutation Schemes Used in Mobile Wireless Communications*; Proceedings of the 9th IEEE International Symposium of Electronics and Telecommunications, ISETC 2010, Timisoara, Romania; p.169-172, ISBN 978-1-4244-8458-4

23. Oltean Marius, Kovaci Maria, Mountassir Jamal, Isar Alexandru, Lazar Petru; *A physical layer simulator for WiMAX*; Proceedings of the 9th IEEE International Symposium of Electronics and Telecommunications, ISETC 2010, Timisoara, Romania; p.133-136, ISBN 978-1-4244-8458-4

24. Beatrice Arvinti, Marius Oltean, Alexandru Isar, Dumitru Toader, Marius Costache; *ECG Statistical Denoising in the Wavelet Domain*; Proceedings of the 9th IEEE International Symposium of Electronics and Telecommunications, ISETC 2010, Timisoara, Romania; p.307-310, ISBN 978-1-4244-8458-4

25. Ioan Eugen Andor, Lucian Ardelean, Horia Balta, Maria Kovaci, Marius Oltean, Alexandru Isar; *A Study of the Permutation Schemes Used in Mobile Wireless Communications*; Proceedings of the 9th IEEE International Symposium of Electronics and Telecommunications, ISETC 2010, Timisoara, Romania; p.169-172, ISBN 978-1-4244-8458-4

26. Cristina Stolojescu; *Long-Range Dependence in WiMAX Traffic*; Proceedings of the 9'th IEEE International Symposium on Electronics and Communications, ISETC 2010, Timisoara; P.241-244, ISBN 978-1-4244-8458-4

27. Cristina Stolojescu, Ion Railean, Sorin Moga, Alexandru Isar; *Comparison of Wavelet Families with Application to WiMAX Traffic Forecasting*; Proceedings of the 12th International Conference on Optimization of Electrical and Electronic Equipment, OPTIM 2010, Brasov. p.932-937, ISBN 978-1-4244-1545-4

28. Firoiu Ioana, Nafornita Corina, Isar Dorina, Boucher J.-M, Isar Alexandru; *An Asymptotic Statistical Analysis of the Hyperanalytic Wavelet Transform*; Proceedings of the 5th European Conference on Circuits and Systems for Communications (ECCSC'10) Belgrade, Serbia; p.274-277, ISBN 978-86-7466-394-3

29. Marius Oltean, Ioana Firoiu; *BER per Scale Performance of a Wavelet OFDM Transmission through Time and Frequency Selective Channels*; Proceedings of 5th European Conference on Circuits and Systems for Communications (ECCSC'10); p.212-215, ISBN 978-1-61284-400-8

30. Andy VESA, Arpad IOZSA; *Direction – of – Arrival Eestimation for Uniform Sensor Arrays*; Proceedings of the 9th IEEE International Symposium on Electronics and Telecommunications, Timisoara, 11-12 noiembrie 2010; p.249-252, ISBN 978-1-4244-8458-4

31. Arpad IOZSA, Andy VESA; *The ESPRIT Algorithm. Variants and precision*; Proceedings of the 9th, International Symposium on Electronics and Telecommunications, Timisoara, 11-12 noiembrie 2010; p.165-168, ISBN 978-1-4244-8458-4

32. Lucaciu Radu; *Multipath Interference Reduction Using Deconvolution in OCDMA Wireless Optical System*; Proceedings of the 9th IEEE International Symposium of Electronics and Telecommunications, ISETC 2010, Timisoara, Romania, November 2010; p.277-280, ISBN 978-1-4244-8457-7

33. Vlădeanu Călin, Păun Adrian Florin, Lucaciu Radu, El Assad Safwan; *Parallel Turbo-TCM Schemes using Recursive Convolutional GF(2N) Encoders over Frequency Non-Selective Fading Channel*; Proceedings of the 9th IEEE International Symposium of

Electronics and Telecommunications, ISETC 2010, Timisoara, Romania, November 2010; p.285-288, ISBN 978-1-4244-8457-4

34. Simu Calin, Eugen Marza; *An Error Study on some Digital Interpolation Kernels for Body Surface Potential Maps*; Proceedings of the 9th IEEE International Symposium of Electronics and Telecommunications, ISETC 2010, Timisoara, Romania, November 2010; p.377-380, ISBN 978-1-4244-8458-4

35. Balint Cornel, Budura Georgeta, Marza Eugen; *Scheduling techniques evaluation in LTE systems with mixed data traffic*; Proceedings of the 9th IEEE International Symposium of Electronics and Telecommunications, ISETC 2010, Timisoara, Romania, November 2010; p.221-224, ISBN 978-1-4244-8458-4

36. Lucaciu Radu, Mihăescu Adrian, Vlădeanu Călin; *Receiver Mobility Influence on OCDMA Indoor Wireless Communications System Performances*; Proceedings of the 9th WSEAS International Conference on Circuits, Systems, Electronics, Control & Signal Processing "CSECS 2010", Recent Researches in Circuits, Systems, Electronics, Control & Signal Processing, Vouliagmeni, Athens, Greece; p.76-80, ISBN 978-960-474-262-2; ISSN 1792-7315

37. Andy VESA, Arpad IOZSA, Florin ALEXA; *The influence of the Phase Current of a Linear Array over the Directivity Pattern*; IEEE International Joint Conferences on Computational Cybernetics and Technical Informatics (ICCC-CONTI 2010), Timisoara, 27-29 Mai 2010; p.131-134, ISBN 978-1-4244-7431-8

38. Simu Calin, Eugen Marza; *Digital Interpolation of Body Surface Potential Maps*; Journal of Electronics Engineering; Vol. 3, Nr.1, 2010, p.197-200, ISSN 1844-6035

39. Simu Calin; *Interpolation techniques applied on sparsely sampled ECG signals – part one: methods and kernels*; Buletinul Ştiinţific al Universităţii "Politehnica" din Timişoara; Tom 55 (69), fasc.1, 2010, p21-24, ISSN 1583-3380

40. Simu Calin; *Interpolation techniques applied on sparsely sampled ECG signals – part two: error evaluation*; Buletinul Ştiinţific al Universităţii "Politehnica" din Timişoara; Tom 55 (69), fasc.1, 2010, P.25-28, ISSN 1583-3380

41. Lucaciu Radu, Mihăescu Adrian; *Simulation Program for FIR Filter Approximation of Indoor Wireless Optical Channel*; Scientific Bulletin of the "Politehnica" University of Timisoara, Transactions on Electronics and Communications, TOM 55(69); Fasc.1, p.8-12, ISSN 1583-3380

42. Ion Railean, Cristina Stolojescu, Sorin Moga, Philippe Lenca; *WIMAX Traffic Forecasting based on Neural Networks in Wavelet Domain*; The Fourth International Conference on Research Challenges in Information Science (RCIS); Proceedings of the Fourth International Conference on Research Challenges in Information Science (RCIS); p.447-455, ISBN 978-988-17012-9-9

43. Lucaciu Radu, Mihăescu Adrian; *Deconvolutional OCDMA for Indoor Wireless Optical Communications*; Proceedings of International Symposium on Embedded Systems Design and Applications, ESDA 2010, Baia Mare, 13-15 May; p.156-159, ISBN 978-606-536-096-9

44. Ion Railean, Sorin Moga, Monica Borda, Cristina Stolojescu; *Neural Networks vs Genetically Optimized Neural Networks in Time Series Prediction*; Proceedings of the Stochastic Modeling Techniques and Data Analysis International Conference (SMTDA 2010); 8 pag; ISBN 978-988-17012-9-9

45. Andy VESA; *Direction of Arrival Estimation using MUSIC and Root – MUSIC Algorithm*; Proceedings of the 18th Telecommunications Forum TELFOR 2010, Belgrad, 23-25 noiembrie 2010; p.582-585, ISBN 978-86-7466-392-9

46. 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 NAFORNIŢĂ*

   PhD students

➢ Mirela BIANU, *Contributions on adaptive signal processing in telecommunications*
➢ 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*,
➢ Teodora PELA, *Traffic Optimization on Metropolitan Area Networks*,
➢ Adina DABA, *Non-Stationary Signal Description by Non-Parametrical Method*,
➢ Arpad IOZSA, *Beamforming techniques*.

➢ Cristian-Alin MOS, *Security systems in road traffic.*

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

   PhD students:
➢ Radu LUCACIU, *Optical communication systems with OCDMA*
➢ 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, *Traffic predictions in wireless networks.*
➢ Victor CUTEANU, *Contributions in satellite receiver design.*
➢ Petru LAZAR, *Protocols in wireless communications networks.*
➢ Ioan ANDOR, *Security techniques used in wireless communications networks.*
➢ Beatrice, ARVINTI, *Tele monitoring for patients suffering from heart desease.*
➢ Lucian, ARDELEAN, *Interference reduction techniques in WiMAX technology.*
➢ Daniel BOJNEAGU, first year student.
➢ Jamal MOUNTASIR, *Study on LTE wireless networks.*

   PHD THESES SUSTAINED

➢ Marius OLTEAN, *Contributions to optimise the radio channel transmission using wavelet functions*, scientific supervisor Prof.dr.eng. Miranda NAFORNITA
➢ Radu LUCACIU, *Cotributions in development of the optical communication systems with OCDMA,* scientific supervisor Prof.dr.eng. Miranda NAFORNITA

➢ Calin SIMU, *Contributions to the ECG signal analysis and processing,* scientific supervisor Prof.dr.eng. Miranda NAFORNITA
➢ Janos GAL, *Contributions on Kalman Filters Use in Telecommunications,* Scientific supervisor Prof.dr.eng. Ioan NAFORNITA
➢ Ioana Firoiu (Adam), *Complex wavelet transform: applications to denoising,* scientific supervisor Prof.dr.eng. Alexandru ISAR

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

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: 150,000 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

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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 2010: 20,000 RON
Members: Prof.dr.eng. Corneliu TOMA
                Assoc.lect.eng. Diana ANDONE
                Lect.dr.eng. Mugur MOCOFAN
                Assist.eng. Marian BUCOS
                Assist.eng. Mihai ONITA
                Eng. Marius CONDREA
                PhD student Iasmina ERMALAI
                PhD student Andrei TERNAUCIUC
                PhD student Cristian TECU

Partners: PhD student Bogdan Dragulescu
Transilvnia 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 2010: 19,713 RON
Members: Prof.dr.eng. Corneliu TOMA
Assoc.lect.eng. Diana ANDONE
Lect.dr.eng. Mugur MOCOFAN
Assist.eng. Marian BUCOS
Assist.eng. Mihai ONITA
Eng. Marius CONDREA
PhD student Iasmina ERMALAI
PhD student Andrei TERNAUCIUC
PhD student Cristian TECU
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 is 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.

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
Assist.eng. Marian BUCOS
Assist.eng. Mihai ONITA
Eng. Marius CONDREA
Lucia RAZMERITA, journalist
Cristian TECU, PhD student
Iasmina ERMALAI, PhD student
Andrei TERNAUCIUC, PhD student
Bogdan DRAGULESCU, PhD student
Partners: University of 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

2. 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
     Assist.eng. Marian BUCOS
     Assist.eng. Mihai ONITA
     Cristian TECU, PhD student
     Iasmina ERMALAI, PhD student
     Andrei TERNAUCIUC, PhD student
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 & sustainably)
2. Creating a **Standard of Quality for Training of Innovationmanagement**, 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 sustainable 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)

PUBLICATIONS

PAPERS

1. Negrea Romeo, Eckstein Andrei, Alexa Florin; *Numerical solutions for a class of nonlinear systems and application to stochastic resonance*; WSEAS Transactions on Mathematics; Issue 3, Volume 9, March 2010, 161-170, ISSN 1109-2769

2. Ermalai Iasmina, Dragulescu Bogdan; *The usefulness and functionality of Microformats in a particular eLearning system*; IEEE International Joint Conferences on Computational Cybernetics and Technical Informatics (ICCC-CONTI 2010); p.387-390, ISBN 978-1-4244-7431-8

3. Andone Diana, Vasiu Radu, Ternauciuc Andrei, Dragulescu Bogdan; *The Use of Social Media Tools in ViCaDiS Virtual Campus*; IEEE International Joint Conference on Computational Cybernetics and Technical Informatics ICCC-CONTI 2010, Timisoara, Romania, 27-29 mai 2010; p. 305-310, ISBN 978-1-4244-7431-8

4. Lacrama Laurentiu, Alexa Florin; *Improved Structuring Element for Handwriting and Hand Printed Characters Skeleton*; Proceedings of the 14th International Conference on Computers, Corfu Island, Greece, 23-25 July 2010; p.403-408, ISSN 1792-4251

5. Vasiu Radu, Andone Diana; *Inter-University Co-operation by Using ViCaDiS Virtual Campus*; Proceedings of the 10th IEEE International Conference on Advanced Learning Technologies, ICALT 2010, Sousse, Tunisia, 5-7 July 2010; p.394-396, ISBN 978-0-7695-4055-9

6. Lacrama Laurentiu, Gherghes Vasile, Alexa Florin, Karnyanszky Tiberiu; *Automatic Survey Processing Ussing MLP Neural Net*; Proceedings of the 10th Symposium on Neural Network Applications in Electrical Engineering

NEUREL 2010, Sept; p.123-126, ISBN 978-1-4244-8821-6

7. Tecu Cristian, Popescu Adrian, Vasiu Radu; *Digital Slideshow Performed Live Using the "Motorway" Application*; Proceedings of the IADIS International Conference A*pplied Computing 2010*, Timisoara, 14-16 Octombrie 2010; p.291-293, ISBN 978-972-8939-30-4 (paper); 978-972-8939-29-8 (CD)

8. Lataretu Florin-Josef, Corneliu Toma; *Improving the Resilience of Multipath TCP by Latency Supervision*; Proceedings of the IADIS International Conference A*pplied Computing 2010*, Timisoara, 14-16 Octombrie 2010; p.281-283, ISBN 978-972-8939-30-4 (paper); 978-972-8939-29-8 (CD)

9. Ermalai Iasmina, Vasiu Radu; *Study Cases on the Current Use of Microformats*; Proceedings of the IADIS International Conference *WWW/Internet 2010*, Timisoara, 14-17 Octombrie 2010; p.387-390, ISBN 978-972-8939-25-0 (paper); 978-972-8939-26-7 (CD)

10. Bucos Marian, Dragulescu Bogdan, Veltan Marius; *Designing a semantic web ontology for E-learning in higher education*; Proceedings of the 9th International Symposium on Electronics and Telecommunications ISETC'10, Timisoara, Romania, 11-12 Noiembrie 2010; 415-418, 4; 978-1-4244-8458-4; 978-1-4244-8460-7 (CD); IEEE Catalog number: CFP1003L-PRT

11. Ermalai Iasmina, Onita Mihai, Vasiu Radu; *Testing the Viability of Podcasting in a Particular E-learning System*; Proceedings of the 9th International Symposium on Electronics and Telecommunications ISETC'10, Timisoara, Romania, 11-12 Noiembrie 2010; 411-414, 4; 978-1-4244-8458-4; 978-1-4244-8460-7 (CD); IEEE Catalog number: CFP1003L-PRT

12. Wolfgang Pross, Franz Quint, Marius Otesteanu; *Using PEG-LDPC Codes for object identification*; Proceedings of the 9th IEEE International Symposium of Electronics and Telecommunications, ISETC 2010, Timisoara, Romania, November 2010; p.225-228, ISBN 978-1-4244-8457-4

13. Vasile Horia Muntean, Marius Otesteanu; *WiMAX versus LTE. An overview of technical aspects for Next Generation Networks technologies*; Proceedings of the 9th IEEE International Symposium of Electronics and Telecommunications, ISETC 2010, Timisoara, Romania, November 2010; p.361-364, ISBN 978-1-4244-8457-4

14. Ermalai Iasmina, Onita Mihai, Mocofan Muguras, Vasiu Radu; *Inserting Microformats into Online Learning Environments*; Scientific Bulletin of "Politehnica" University of Timisoara, Transactions on Automatic Control and Computer Science; vol. 55(69) No. 1, March 2010, pp. 37-42, ISSN 1224-600X

15. V. H. Muntean, M. Otesteanu, G.M. Muntean; *QoS Parameter Mapping for E-learning Content Delivery over LTE Networks*; Scientific Bulletin of "Politehnica" University of Timisoara, Transactions on Automatic Control and Computer Science; Tom 55 (69), Vol 3, 2010, P.161-170, ISSN 1224-600X

16. Negrea Romeo, Eckstein Andrei, Alexa Florin; *On a numerical method for a class of backward stochastic differential equations and application to stochastic resonance*; Proceedings of the International Symposium on STOCHASTIC MODELS in RELIABILITY ENGINEERING, LIFE SCIENCE and OPERATIONS MANAGEMENT, Beer Sheva, February 8-11, 2010, Israel; p.744-753.

17. Tecu Cristian, Popescu Adrian, Vasiu Radu; *PhotoSlide Toolbar: Using the Internet Browser for Managing Real-Time Digital Slideshow*; IADIS International Conference "E-Society" 2010, Porto, Portugal, 18-21 March 2010; Proceedings of the IADIS International Conference; p.503-506, ISBN 978-972-8939-06-9 (CD)

18. Vasiu Radu, Andone Diana, Robu Nicolae; *A Virtual Campus for Digital Students - Paradigms and Guidelines*; Proceedings of the EDEN 2010 Annual Conference "Media Inspirations for Learning. What Makes the Impact?", Valencia, Spain, 9-12 Iunie 2010; 6 pag.; ISBN 978-963-06-9429-2 (Book of abstracts); ISBN 978-963-06-9430-8 (CD)

19. Lătărețu Florin Josef, Toma Corneliu Ioan; *Improving the Resilience of Multipath TCP by Latency Supervision*; Proceedings of the IADIS International Conference "Applied Computing 2010", Timişoara, România, 14-16 October 2010; p.281-283, ISBN 978-972-8939-30-4

PhD RESEARCH ACTIVITIES

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

PhD students:

➢ 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.*

➢ Radu CLESIU, *Applications of the Petri networks in robotics.*

➢ Gheza-Gavril DOHI-TREPZSKER, *Video surveillance techniques for the detection of wathersed pollution using floats.*

➢ Sorin IVASCU, *Advanced techniques in image processing.*

➢ Dan-Cristian BOGOS, *Inteligent communications networks.*

➢ Dan-Mihai MIHAILESCU, first year student.

➢ Florentina-Anica BOTEZATU, first year student.

2. Prof. dr. eng. Marius Oteşteanu

   PhD students:

➢ Daniel POPA, *Object traking in videosequences.*

➢ Ion-Cosmin DITA, *Detections and recognitions of matrix codes.*

➢ Vasile-Horia MUNTEAN, *4G mobile communications networks.*

➢ Pross Wolfgang (Germania)*, Coding for error corrections for matrix codes.*

3. Prof.dr.eng. Radu VASIU

   PhD students:

➢ Mihai I. ONIȚĂ: *Using new information technologies in e-learning process.*

➢ Cristian TECU, *Contributions to the use new information technologies in digital slide show.*

➢ Andrei TERNAUCIUC, *Contributions to achievement of personalized learning environments.*

➢ Bogdan Dragulescu, *Semantic WEB ontologies in educational environment.*

➢ Andrei RUSAN, first year student

➢ Michaela CALOTESCU, *IT tools to increase managerial capacity in large institutions.*

➢ Daniel IVANC, *mLearning technologies.*

➢ Adrian POPESCU, *Intelligent interactive multimedia platform for e-learning.*

➢ Mohamed KUSSAY, *Video quality estimation over wireless network.*

➢ Alexandru-Sorin PETAN, *Contributions to the achievement of interoperability of e-learning platforms.*

➢ Andrei GABOR, first year student.

➢ George MULEC, *Contributions to the security of multi-hop ad-hoc wireless networks based on IEEE's 802.11 standard.*

➢ Andrei-Marius GABOR, firs year student.

PHD THESIS SUSTAINED

➢ Florin-Josef LĂTĂREȚU: *Methods to improve the performance of the resilience and recovery in communications network,* Scientific supervisor: Prof. dr. eng. Corneliu TOMA

➢ Mirela-Laura IOANEŞIU: *Contributons to improve voice transmission quality in wireless networks based on IEEE 802.11 standard,* Scientific supervisor: Prof. dr. eng. Corneliu TOMA

➢ Cristian TECU, *Contributions to the use new information technologies in digital slide show*, Scientific supervisor: 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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RO-300223 Timişoara,
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E-mail: alimpie.ignea@etc.upt.ro
           http://www.meo.etc.upt.ro/imcem/

GENERAL PRESENTATION

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

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. *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 lei (12380 RON on 2010)

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. The project is focused on the promotion of new architectural concepts which include active solar systems (photovoltaic generators) or passive solar systems (lighting systems). The proposed actions will contribute to the sustainable development of the national energy system by promoting the distributed photovoltaic systems, in accordance with the Government global objective to promote renewable energy sources in Romania. The advantages of using the distributed solar architecture are more conspicuous in the case of large network-connected PV systems, such as the PV systems in the urban area, installed on the buildings façades or roofs. These are complex installations with a high number of PV modules and they are incorporated under various angles and directions.

ACTIVITIES AND RESULTS

1. Surveys, research and solutions regarding the solar architecture in Romania.
2. Surveys, measurements and technical solutions for the pilot installations with integrated photovoltaic systems;
3. Construction of two demonstration pilot photovoltaic installations monitored at the West University Timisoara (UVT) and at the University of Architecture and Urban Planning "Ion Mincu" (UAUIM), Bucharest;
4. Experiments, tests and outcome analysis.
5. Large-scale dissemination, such as: brochures, posters, scientific articles presented at both national and international events, and last, but not the least, creation of a website by which all information

activities, training and the promotion of the concept of solar architecture will be achieved.

Contact person:
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Tel: +40-256-403359
E-mail: traian.jurca@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 GĂSPĂRESC: *Perturbation monitoring in electrical networks*

- Adrian MIHĂIUȚ: *Contributions in anntenas calibration*

- Doru Lucian COCOŞ, *Neural Networks and Fuzzy Logic applications to electronic meter calibration*

- Teodor PETRIȚA, *Contributions to radiofrequency disturbances monitoring*

PHD THESIS SUSTAINED

- Ciprian DUGHIR: *Contributions to the monitoring of the power quality*, Scientific supervisor: Prof. dr. eng. Alimpie IGNEA

PUBLICATIONS

BOOKS

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