Contents

1. General information 2
2. Structure of the Faculty of Electronics and Telecommunications 4
2.1. Applied Electronics Department 6
2.2. Communications Department 7
2.3. Measurements and Optical Electronics Department 9
3. Educational activity 11
3.1. The "College of Higher Education" level 11
Curriculum for the Academic Year 2005 - 2006 13
3.2. The "License Engineer" level 17
Entry Standards and Student Performance 17
Curriculum for the Academic Year 2005 - 2006 20
3.3. The "Master" level 36
Curriculum for the Academic Year 2005-2006 37
3.4. The "PhD Engineer" level 40
4. Research 49
4.1 Intelligent Industrial Electronic Systems - IIES Research Center 49
4.2 Research Center On Instrumentation, Measurement And Electromagnetic Compatibility (IMCEM) 57
4.3 Communications Department Research Activity 64
5. Publications 80
5.1 Papers 80
5.2 Books 92
6. Other activities 93
6.1. International cooperation 93
6.2 The International Symposium of Electronics and Telecommunications – "ETc 2006" 96
6.3 Student Research Activities 116
6.4 Social life 118

1. General information

This booklet presents an overview of the activities taking place at the Faculty of Electronics and Telecommunications from the "Politehnica" University of Timişoara.

It emphasizes the activities of 2006. Information about the structure of the faculty, its position in the "Politehnica" University, and data concerning educational and research activities are presented.

This booklet contains only a short description. More detailed information can be obtained through the faculty and department secretariates.

You can also find more information visiting our site on the INTERNET:

http://www.etc.upt.ro

The "Politehnica" University of Timişoara was founded in 1920, with the purpose of serving the technical education and research needs in western Romania. The University is public, and consists of 9 faculties.

The study of Electronics at the "Politehnica" University of Timişoara was introduced in 1931, by the late Prof. Remus Răduleţ, member of the Romanian Academy.

In 1970 the specialization of "Electronics and Telecommunications" was set up at the Faculty of Electrical Engineering. In 1974 the department of "Electronics-Automation-Measurements" was founded. In 1976 the Faculty of Electric Engineering moved its headquarters to the present building. In this way, the number of laboratories and the endowment increased substantially.

In 1990 the specialization of "Electronics and Telecommunications" became the "Faculty of Electronics and Telecommunications". Starting 1991, a short-cycle higher education program (College level) has been created, but the activity will end in 2007.

In 1994 the "Master" program was introduced.

Our Faculty provides specialized training of engineers in Electronics and Telecommunications. It provides two areas of specialization: Applied Electronics and Telecommunications. The College provided specialized training in the field of Electronics, Communications and Postal Services, and also Audio-Video and Multimedia Technologies.

The teaching activities are organized in three levels of study:

- short duration programs (college);
- long duration programs (license);
- postgraduate programs (Master and Ph.D.).

The "short duration" education level is organized over a 3-year period, and is equivalent with a College of Higher Education.

The "long duration" education level is organized over a 4-year period. Students graduating from this educational form obtain an "engineer" degree.

The Master educational level consists of a 2-year program of study.

A Ph.D. degree must be completed in three years.

The faculty has three departments:

- **Applied Electronics;**
- **Communications;**
- **Measurements and Optical Electronics,**

and cooperates with other faculties and departments like Mathematics, Physics, Electrical Engineering, Computer Science, Mechanical Engineering, Management, etc.

Education is based on modern methods, especially with respect to practical activities. Special attention is paid to applied informatics. The teaching staff devotes a considerable amount of time to research.

The activities tacking place in the faculty are organized in several research teams, lead by professors who are also Ph.D. advisors. These teams are presented in the next chapters.

The governing authorities of the Faculty of Electronics and Telecommunications are:

- the Faculty council;
- the Executive Board of the Faculty Council;

The Administrative Officers and the Executive Board of the Faculty Council are in charge of the ordinary activities in the faculty.

2. Structure of the Faculty of Electronics and Telecommunications

The Executive Board of the faculty is composed of:

- Dean: Prof. dr. eng. Marius OTEŞTEANU ;
- Vice Dean: Prof. dr. eng. Alimpie IGNEA;
- Vice Dean: Prof. dr. eng. Aurel GONTEAN;
- Scientific Secretary: Prof. dr. eng. Aldo DE SABATA.

Faculty address:

Bd. Vasile Pârvan No. 2,
Postal code: 300223, City: Timişoara, Country: Romania.

Phone (Dean's office, secretariate):

- direct: (+40)-(0)256-403291
- fax: (+40)-(0)256-403295
- e-mail: dean@etc.utt.ro

Secretariat: Chief Secretary Gabriela VINTILĂ, secretariat@etc.utt.ro
Simona SOMOŞAN, Oana TRANCOTĂ, Minerva POPA

Secretariat of the Applied Electronics (AE) Department:

- office no. B101,
- phone: (+40)-(0)256-403331;

Secretariat of Communications (COM) Department:

- office no. B201,
- phone: (+40)-(0)256-403301;

Secretariat of the Measurements and Optical Electronics (MOE) Department:

- office no. B301,
- phone: (+40)-(0)256-403362.

Faculty Council:

1. Prof. dr. eng. Ivan BOGDANOV, Head of Departament AE
2. Prof. dr. eng. Aldo DE SABATA, Scientific Secretary
3. Prof. dr. eng. Aurel GONTEAN, Vice Dean
4. Prof. dr. eng. Alimpie IGNEA, Vice Dean
5. Prof. dr. eng. Alexandru ISAR
6. Prof. dr. eng. Traian JURCA, Head of Departament MOE
7. Prof. dr. eng. Ioan NAFORNIȚĂ, Head of Departament COM
8. Prof. dr. eng. Marius OTEŞTEANU, Dean
9. Prof. dr. eng. Viorel POPESCU
10. Prof. dr. eng. Mihail TĂNASE
11. Prof. dr. eng. Corneliu TOMA
12. Prof. dr. eng. Liviu TOMA
13. Prof. dr. eng. Radu VASIU
14. Assoc. Prof. dr. eng. Dorina ISAR
15. Assoc. Prof. dr. eng. Dan LASCU
16. Assoc. Prof. dr. eng. Eugen MÂRZA
17. Lect. Dr. eng. Georgeta BUDURA
18. Adrian BERINDE, student V AE
19. Diana BUDEA, student IV TC
20. Cristina COMAN, student II
21. Cristina ŞERBAN, student III TC
22. Lucian ALEXANDRESCU, student II A
23. Emilia CARAGEA, student III ETc

2.1. Applied Electronics Department

Phone/Fax: +40-(0)256-403331 / +40-(0)256-403362
Web page: http://www.etc.utt.ro/ea
E-mail: ivan.bogdanov@etc.upt.ro

Department board:

- Prof. dr. eng. Ivan BOGDANOV - head of department
- Prof. dr. eng. Mircea CIUGUDEAN
- Prof. dr. eng. Virgil TIPONUȚ
- Assoc. Prof. dr. eng. Dan LASCU
- Lect. eng. Mircea BĂBĂIȚĂ

Staff

- Prof. dr. eng. Ivan BOGDANOV: Industrial Robots, Computer control of electrical drives;
- Prof. dr. eng. Horia CÂRSTEA: Electronic Technology. Electric Equipment Testing;
- Prof. dr. eng. Mircea CIUGUDEAN: Conception of Analogic Integrated Circuits and their Applications;
- Prof. dr. eng. Sabin IONEL: DSP applications. Statistical signal processing. Failure diagnosis;
- Prof. dr. eng. Tiberiu MUREŞAN: Digital Circuits. Industrial Robot Driving. Switched Mode Power Supplies;
- Prof. dr. eng. Viorel POPESCU: Power Electronics, Switched-Mode Power Supplies;
- Prof. dr. eng. Mihail Eugen TĂNASE: Doppler Telemetry;
- Prof. dr. eng. Virgil TIPONUȚ: Analog Electronic Circuits. Logic Programmed Systems. Sensors and Transducers. Neural Networks;
- Assoc. Prof. dr. eng. Dan ANDREICIUC: Industrial Robots, Mobile Robots.
- Prof. dr. eng. Aurel GONTEAN: Programmed Logic Systems. Digital Circuits;
- Assoc. Prof. dr. eng. Dorina ISAR: Industrial Process Control Equipment. Signal Processing for Signal/Noise Ratio Enhancement;
- Assoc. Prof. dr. eng. Ioan JIVEȚ: Designing the ASIC (VLSI) Circuits. Design of Digital Systems with Micro-Controllers and Micro-Processors. Clinical applications of electrical bio-impedance. Tomography;
- Assoc. Prof. dr. eng. Dan LASCU: High Frequency Power Processors, Power Factor Correction Circuits; Modeling and CAD in Power Electronics
- Lect. Dr. eng. Cătălin CĂLEANU: Electronic Devices and Circuits
- Lect. Dr. eng. Lucian JURCA: Analog Electronic Circuits;

- Lect. Dr. eng. Adrian POPOVICI: Industrial Electronics; Materials for Electronics.
- Assist. Eng. Mircea BĂBĂIȚĂ: Digital Circuits; Electrical Drives
- Assist. Eng. Marlene DĂNEȚI: DSP applications. Statistical signal processing. Failure diagnosis. Multimedia.
- Assist. Beniamin DRĂGOI: Conception of Analog Integrated Circuits.
- Assist. Eng. Aurel FILIP: Analog Electronic Circuits;
- Assist. Eng. Ioan LIE: Electronics. Doppler Telemetry.
- Assist. Eng. Valentin MARANESCU: Conception of Analog Integrated Circuits.
- Assist. Eng. Dan NEGOIȚESCU: Industrial Electronics, Power Factor Correction Circuits;
- Assist. Eng. Petru PAPAZIAN: Digital Circuits.
- Assist. Eng. Sorin POPESCU: Analog Electronic Circuits. Logic Programmed Systems.
- Teaching Assist. Eng. Bogdan MARINCA: Doppler Telemetry.

Other employees: 2 principal technicians, 5 technicians and 2 secretaries.

2.2. Communications Department

Phone/Fax: +40-(0)256-403301
Web page: http://www.etc.utt.ro
E-mail: ioan.nafornita@etc.utt.ro

Department board:

- Prof. dr. eng. Ioan NAFORNIȚĂ - head of department;
- Prof. dr. eng. Alexandru ISAR;
- Assoc. Prof. dr. eng. Florin ALEXA;
- Assoc. Prof. dr. eng. Eugen MÂRZA;

Staff

- Prof. dr. eng. Andrei CÂMPEANU: Telecommunication Equipment Technology, Telecommunication Circuits;
- Prof. dr. eng. Vasile GUI: Image Processing. Electronic Circuits and Devices;
- Prof. dr. eng. Alexandru ISAR: Signals, Circuits and Systems. Wavelets theory's applications. Time-frequency representations. Compression. Coding;
- Prof. dr. eng. Ioan NAFORNIȚĂ: Signals, Circuits and Systems. Adaptive Signal Processing. Time-frequency representations. Wavelets theory's applications. Microwave Technique;

- Prof. dr. eng. Miranda NAFORNIȚĂ: Theory of Information and Coding. Data Transmission. Signals, Circuits and Systems. Modern Communication Networks;
- Prof. dr. eng. Marius OTEȘTEANU: Television, Telephone Transmission Systems, and Information Recording Techniques;
- Cons. Prof. dr. eng. Anton POLICEC: Medical Electronics; Radio communications;
- Prof. dr. eng. Corneliu TOMA: Television. Analogue Electronics; Image Compression, Motion Analysis, Pattern Recognition, Multimedia Technologies;
- Prof. dr. eng. Radu VASIU: Telecommunication Equipment Testing, Television and Digital Television; Multimedia Applications Development;
- Assoc. Prof. Dr. eng. Florin ALEXA: Television; Sound Technique; Multimedia;
- Assoc. Professor Dr. eng. Lorin FORTUNA: Switching Systems for Telecommunications. Mail Traffic;
- Assoc. Prof. dr. eng. Eugen MÂRZA: Radio communications, Mobile Radio, Radio Systems Engineering;
- Lect. Prof. Eng. Muguraş MOCOFAN: Machine Vision and Pattern Recognition; Multimedia; Studio Equipment; Video Production;
- Lect. Dr. eng. Corina BOTOCA: Microwave Technique. Signals, Circuits and Systems. Neural networks;
- Lect. Dr. eng. Georgeta BUDURA: Signals, Circuits and Systems. Nonlinear Signal Processing, Telecommunication Circuits;
- Assistant Prof. Eng. Cornel BALINT: Switching Systems for Telecommunications;
- Assist. Prof. Eng. Horia BALTĂ: Optical Transmission and Processing of Information. Statistical Theory of Information Transmission, Theory of Information and Coding;
- Assist. Prof. Eng. Mirela BIANU: Microwave Technique;
- Tech. Assist. Eng. Constantin M. BUCOS: Multimedia; Studio Equipment; Video Production;
- Assist. Prof. Eng. Janos GAL: Signals, Circuits and Systems. Telecommunication Circuits;
- Assist. Prof. Eng. Maria KOVACI: Statistical Theory of Information Transmission, Theory of Information and Coding, Signals Circuits and Systems;
- Assist. Prof. Eng. Eugen LONTIŞ: Telephone Transmission Systems; Medical Electronics;
- Assist. Prof. Eng. Radu LUCACIU: Optical Transmission and Processing of Information;
- Assist. Prof. Eng. Nicolae MICLĂU: Optical Transmission and Processing of Information, Theory of Information and Coding;
- Assist. Prof. Eng. Tiberiu MUNTEAN: Optical Transmission and Processing of Information, Theory of Information and Coding, Radiocommunications;

- Assist. Prof. Eng. Marius OLTEAN: Data Transmission on Radio Channels;
- Assist. Prof. Eng. Marius SALAGEAN: Signals, Circuits and Systems;
- Assist. Prof. Eng. Călin SIMU: Medical Electronics, Radio communications;
- Assist. Prof. Eng. Andy VESA: Signals, Circuits and Systems. Mobile Radiocommunications;
- Teach. Assist. Eng. Adina DABA: Television, Telephone Transmission Systems, and Information Recording Techniques;
- Teach. Assist. Eng. Corina NAFORNITA: Digital Signal Processing. Digital Watermarking;

2.3. Measurements and Optical Electronics Department

Phone/Fax: +40-(0)256-403361 / +40-(0)256-403362,
Web page: http://www.meo.etc.utt.ro
E-mail: traian.jurca@etc.utt.ro.

Department board:

- Prof. dr. eng. Traian JURCA- head of department;
- Prof. dr. eng. Liviu TOMA
- Prof. dr. eng. Dan STOICIU

Staff

- Prof. dr. eng. Mircea CHIVU: Electronic and Electric Measurements, Measuring of the Electrical and Not Electrical Quantities. Television Channels Broadcasted Via Satellite;
- Consultant Prof. dr. eng. Sever CRIŞAN: Optical Electronics. Electrical Measurement, Sensors and Transducers;
- Prof. dr. eng. Aldo De SABATA: Adaptive Methods in Measurements, Signal Processing, Microwaves;
- Prof. dr. eng. Alimpie IGNEA: Electronic and Electric Measurements, Measuring in Industrial Process. Measuring Systems in the Electromagnetic Compatibility; Electromagnetically Supervising of sites, Antennas calibration, Nonlinearities study of high frequency devices;
- Prof. dr. eng. Traian JURCA: Electronic Measuring Instruments. Structural Components of Precision Instrumentation. Programmable Measuring Systems;
- Consultant Prof. dr. eng. Eugen POP: General Theory of Measurement, Digital Processing of Signals in Measuring Instruments;

- Prof. dr. eng. Dan STOICIU: Electronic Measuring Instruments, Metrology, Quality and Maintenance. Measuring in Industrial Process;
- Prof. dr. eng. Liviu TOMA: Data Acquisition Systems. Microprocessor System Architecture. Digital Processing Structures;
- Assoc. Prof. dr. eng. Mihaela LASCU: Measuring of the Electrical and Not Electrical Quantities. Electrical Measuring of the Non Electrical Quantities. Measuring in Industrial Process; Virtual Instrumentation;
- Lect. dr. eng. Daniel BELEGA: Measuring Systems in the Electromagnetic Compatibility. Instruments for Measurements. Digital Processing Structures;
- Lect. dr. eng. Septimiu MISCHIE: Electronic and Electric Measuring. Programmable Measuring Systems. Structural Components of Precision Instrumentation.
- Lect. dr. eng. Adrian VÂRTOSU: Microwaves, Microwaves and Optoelectronics Measurement, Television Channels Broadcasted Via Satellite;
- Assist. Eng. Emil LUZAN: Measuring of Environmental Factors, Measuring of the Electrical and Non Electrical Quantities;
- Assist. dr. eng. Robert PASZITKA: Microprocessor System Architecture. AC calibrators.
- Assist. Eng. Ciprian DUGHIR: Electromagnetical Supervising of Sites, Antennas calibration.
- Assist. eng. Liliana STOICA: Electromagnetic Compatibility, Signal Processing, Electronic Devices
- Assist. eng. Cora IFTODE, Electromagnetic Compatibility, Signal Processing, Electronic Devices
- Assist. eng. Adrian MIHAIUTI, Antenna Theory and Calibration, Electromagnetic Compatibility, Signal Processing

Other employees: 2 technicians, 1 secretary and 1 computer operator.

3. Educational activity

- The Faculty of Electronics and Telecommunications provides education in electronic engineering in general and industrial electronics, telecommunications and measurement in particular. The Faculty offers three educational programs:
- A three year short-cycle higher education program (College of Higher Education level). Graduation is conditioned by the passing of two examinations (a theoretical one and a practical one) and by the oral defence of a graduating project. A B.S. equivalent degree in Engineering is awarded. The College will cease its activity at the end of 2007.
- A four - year - program. Graduation is conditioned by the passing of the Licence examination and the oral defence of the graduation project. If these requirements are met, the Licence Engineer degree is awarded.
- A two - year - program of Master Study. A successful oral defence of the dissertation leads to graduation and the award of the Master degree.
- A second stage of the postgraduate program leads to the Doctor Engineer degree.

Education is organized according to the transferable credits system (ECTS).
The license-Master-doctorate (LMD) system, in accordance with the Bologna Declaration, has been introduces in 2005.

3.1. The "College of Higher Education" level

For careers in: Production, design, development and testing in Industrial Electronics, Communications and Multimedia Engineering. The College will end its activity in 2007.

Program content

All students take core units in the first year in : mathematics, physics, general electronics and measurement. Students cover three specializations related to the general field of Electronics Engineering:

- Electronics;
- Communications and Postal Services;
- Audio-video and Multimedia Technologies.

Specific units related with the specialization are covered in the second and the third year.

Electronics (E):

This specialization involves theoretical or practical and hands-on courses in: industrial electronics, robotics, control, testing of electronics equipment, numerical control of industrial processes. The E develops product test, design and development skills required in industry.

Communications and Postal Services (CPS)

This specialization involves theoretical or practical and hands-on courses in: data communications, radio and optical communications, telecommunication circuitry, postal traffic. The CPS develops product test, design and development skills required by the communication industry.

Audio-video and Multimedia Technologies (AMT)

This specialization involves theoretical or practical and hands-on courses in: communications, multimedia production and applications, audio-video production, aesthetic and philosophical trends of communications. The AMT develops production and broadcasting skills required by the television, radio and communication industry.

Number of students 2005/2006

Year of study	Spec.	Total number of students	Number of graduated students	Number of ungraduated students	Number of drop-out students
Second year	AMT	57	8	37	12
Third year	AMT	38	25	8	5

Curriculum for the Academic Year 2005 - 2006

Students' training in the fields of Electronics, Communications and Postal Services, and Audio-Video and Multimedia Technologies is done according to the following curricula:

First Year of Study for Bachelor-level

Sem.	Course Title	Structure [hours/week]				Credit points
		C	S	L	P	
I	Computer Basics and Programming 1 **	2	0	2	0	5
	Electrotechnique	2	2	0	0	4
	Physics	2	1	1	0	4
	Matehamatical Analysis	3	2	0	0	5
	Linear Algebra, Analytical and Differrential Geometry	3	2	0	0	5
	Electronic Devices and Circuits 1 **	1	0	1	0	3
	Foreign Languages 1* **	0	2	0	0	2
	Sports 1	0	2	0	0	-
	Practical training 45 hours					2
II	Computer Basics and Programming 2	2	0	2	0	4
	Electronic Devices and Circuits 2	3	0	3	0	6
	Materials and Passive Electronic Components **	2	0	1	0	3
	Signal Processing	3	0	2	0	6
	Electric and Electronic Measurements	2	0	2	0	4
	Management and Marketing **	2	1	0	0	3
	Foreign Languages 2* **	0	2	0	0	2
	Sports 2	0	2	0	0	-
	Practical training 45 Hours					2

* A foreign language is chosen from: English, French or German.
** Coll.

Second Year of Study for Electronics

Sem.	Course Title	Structure [hours/week]				Credit Points
		C	S	L	P	
I	Electrical machines	2	0	2	0	4
	Analog Integrated Circuits	3	0	2	0	6
	Equipment Testing	2	0	1	0	3
	Electronic Technology **	2	0	1	0	3
	Digital Integrated Circuits	3	0	3	0	5
	Measurements in Industrial Processes	3	0	3	0	6
	Sports 3 **	0	2	0	0	1
	Practical Training 45 hours					2
II	Television	3	0	2	0	6
	Radiocommunications	3	0	3	0	6
	Microprocessors and Microcontrollers	3	0	2	0	6
	Industrial Electronics 1	3	1	2	0	6
	Medical Electronics **	2	0	2	0	4
	Practical Training 45 Hours					2

** Coll.

Second Year of Study for Communications and Postal Services

Sem.	Course Title	Structure [hours/week.]				Credit points
		C	S	L	P	
I	Analog Integrated Circuits	3	0	2	0	6
	Communications Basics **	3	0	2	0	5
	Telecommunications Circuits	2	0	3	0	5
	Communications Equipment Testing	2	0	1	0	3
	Electronic Technology **	2	0	1	0	3
	Digital Integrated Circuits	3	0	3	0	5
	Sports 3 **	0	2	0	0	1
	Practical Training 45 hours					2
II	Optical and Microwave Comm. **	3	0	2	0	5
	Television	3	0	2	0	6
	Radiocommunicatons	3	0	3	0	6
	Microprocessors and Microcontrollers	3	0	2	0	6
	Multiple Transmission Systems	3	0	2	0	5
	Practical training 45 Hours					2

** Coll.

Second Year of Study for Audio-Video and Multimedia Technologies

Sem.	Course Title	Structure [hours/week]				Credit Points
		C	S	L	P	
I	Integrated Circuits	3	0	2	0	6
	Multimedia Applications Development 1	3	0	3	0	6
	Operating Systems	2	0	2	0	4
	Virtual Reality and Graphics	2	0	2	0	5
	Internet-Intranet. Protocols and Applications	2	0	2	0	4
	Law **	2	1	0	0	3
	Practical Training 45 hours					2
II	Object Oriented Programming	2	0	4	0	6
	Television	3	0	2	0	6
	Multimedia Applications Development 2 **	0	0	2	0	2
	Studio Equipment **	3	0	2	0	5
	Technics of Sound	2	0	2	0	5
	Data Bases	2	0	2	0	4
	Practical Training 45 Hours					2

** Coll.

Third Year of Study for Electronics

Sem.	Course Title	Structure [hours/week]				No. of weeks	Credit Points
		C	S	L	P		
I	Electronic Systems for Automatic Control	3	0	2	0	7	3
	Industrial Electronics 2	4	0	4	0	7	4
	Control Equipment	3	0	4	0	7	4
	Robotics basics	3	0	3	0	7	4
	Graduation Thesis Preparation					7	15
II	Practical Training 420 hours					14	30

Third Year of Study for Communications and Postal Services

Sem.	Course Title	Structure [hours/week]				No. of weeks	Credit Points
		C	S	L	P		
I	Switching Systems	4	0	4	0	7	4
	Data Communications	5	0	4	0	7	4
	Postal Services	2	0	2	0	7	3
	Telecommunication networks	2	0	3	0	7	4
	Graduation Thesis Preparation					7	15
II	Practical Training 420 hours					14	30

Third Year of Study for Audio-Video and Multimedia Technologies

Sem.	Course Title	Structure [hours/week]				No. of weeks	Credit Points
		C	S	L	P		
I	Audio-Video Production	5	0	4	0	7	4
	Multimedia Applications Development 3	2	0	3	0	7	4
	Computer Networks	3	0	3	0	7	4
	Radio-TV Journalism	3	0	3	0	7	3
	Graduation Thesis Preparation					7	15
II	Practical Training 420 hours					14	30

3.2. The "License Engineer" level

The educational goals of this level are:

- to give students comprehensive theoretical and practical knowledge in the field of electronic engineering;
- to provide students with practical skills for manufacturing electronic equipment and to be introduced to the most recently developed techniques and devices in the design of electronic equipment;
- to familiarize students with permanent intellectual work;
- to accustom students to informatics and computer technology with the purpose of using Computer Aided Design;
- to give adequate knowledge in economics and business management, enabling graduates to take part directly in industrial activities or to work as managers;
- to teach students foreign languages, to integrate themselves in the mobility programs promoted by the European Community and to enable their participation to international cooperation and research programs;
- to provide students with knowledge in humanities for professional inter-communication.

Entry Standards and Student Performance

Entry requirements

Enrolment of students in the first year follows an admission examination, where candidates'general knowledge in mathematics are assessed.

Details of entry standards

The admission examinations are of the MCQ (Multiple-Choice Queries) type, with a maximum score of 100. A successful candidate must obtain a minimum score of 44. The final score is calculated by taking into account the Baccalaureate score, which is weighting 20 %. The actual entrance minimum score may vary according to the number and level of the candidates. A statistics over the last years is presented below.

Years	Number of candidates	Number of admitted	Minimum entry score
2003/2004	375 for public funded places	218 public funded 100 self funded	7.31/10 5.57/10
2004/2005	605 for public funded places	216 public funded 81 self funded	7.90/10 5.00/10
2005/2006	377 for public funded places	280 public funded 39 self funded	7.29/10 5.04/10
2006/2007	356 for public funded places	295 public funded 25 self funded	6.437/10 5.271/10

Arrangements for direct entry

Graduates of other faculties that were awarded a licence diploma can be directly enrolled in an appropriate year of study, in accordance with ECTS.

College graduates that were awarded a license diploma can enrol in the third year of the 5-year cycle, after passing a number of difference examinations.

A certain number of candidates can follow the courses and obtain a diploma if they choose to finance their studies and obtain a minimum score of 5/10 at the admission exam.

Number of students

2002/2003

Year of study	Spec.	Total number of students	Number of graduated students	Number of ungraduated students	Number of drop-out students
First year	AE + TC	348	91	167	90
Second year	AE + TC	291	66	130	95
Third year	AE	81	21	32	28
Fourth year	AE	102	25	71	6
Fifth year	AE	86	57	28	1
Third year	TC	134	46	63	25
Fourth year	TC	83	56	23	4
Fifth year	TC	83	80	1	2

2003/2004

Year of study	Spec.	Total number of students	Number of graduated students	Number of ungraduated students	Number of drop-out students
First year	AE + TC	359	249	10	100
Second year	AE + TC	334	179	6	149
Third year	AE	133	97	2	34
Fourth year	AE	101	83	3	15
Fifth year	AE	102	96	0	6
Third year	TC	139	116	2	21
Fourth year	TC	117	112	0	5
Fifth year	TC	83	79	1	3

2004/2005

Year of study	Spec.	Total number of students	Number of graduated students	Number of ungraduated students	Number of drop-out students
First year	AE + TC	307	212	11	84
Second year	AE + TC	324	244	9	71
Third year	AE	141	109	5	27
Fourth year	AE	106	90	2	14
Fifth year	AE	168	145	2	21
Third year	TC	150	111	4	35
Fourth year	TC	116	103	2	11
Fifth year	TC	146	136	0	10

2005/2006

Year of study	Spec.	Total number of students	Number of graduated students	Number of ungraduated students	Number of drop-out students
First year	AE + TC	313	53	192	34
Second year	AE + TC	237	54	149	17
Third year	AE	119	26	66	27
Fourth year	AE	103	22	61	20
Fifth year	AE	86	70	12	4
Third year	TC	119	22	61	36
Fourth year	TC	116	44	60	12
Fifth year	TC	108	78	24	6

AE=Applied Electronics
TC=Telecommunications
Note: The third coloumn in the above tables includes reenrolled students who were dropped out in past years.

Average duration of study for the last years:

Year of study	Specialization	Average duration of study
2003/2004	AE	5.23 years
	TC	5.61 years
2004/2005	AE	5.87 years
	TC	5.57 years
2005/2006	AE	5.60 years
	TC	5.22 years

Note: AE = Applied Electronics, TC = Telecommunications.

Structure of the Academic Year

The academic year consists of two 14-week semesters and 3 examination sessions. The license and dissertation (Master) examinations take place in June and February. The Entrance examinations take place in July and September.

The holidays are:

1. Christmas holiday (two weeks);
2. after the winter session of examinations (one week);
3. Easter holiday (one week);
4. Summer holiday (three months).

Participation to the teaching activities

The teaching activity is organized in: courses, seminars, laboratory and project classes. Each academic session has as a prerequisite 100 % attendance of the laboratory classes.

Examinations and continuous assessment

Each subject ends with an examination or another assessment form as stipulated in the curriculum. The form of the examination (either written or oral) is proposed by the department and approved by the Faculty Council.

Students can take their examinations and continuous assessments no more than three times, reexamination for grade improvement being included.

Dismissal and Reiteration

At the end of a year, a student must have obtained a minimum number of 40 credit points from a total of 60/year, from which a minimum number of 30 after the summer session. If these conditions are not accomplished, students are removed from the faculty registers. They can register again in the next year, on their own expenses, until the missing obligations are completed.

Curriculum for the Academic Year 2005 - 2006

Before the introduction of the LMD system, the curriculum for the licensed engineer level was divided in two cycles:

- First - cycle (along the first and the second year of study),
- Second - cycle (along the third, forth, and fifth year of study).

In 2005/2006, this system has been followed by students from the second to the fifth year. The corresponding curriculum is presented below.

First Year of Study for Electronics (First - cycle)

Sem.	Course Title	Structure [hours/week]				Credit points
		C	S	L	P	
I	Math Analysis 1	3	2	0	0	5
	Algebra and Geometry	3	2	0	0	5
	Programming Languages and Techniques 1	2	1	2	0	5
	Physics 1	2	1	1	0	4
	Mechanical Engineering **	2	0	1	0	4
	Philosophy **	0.5	0.5	0	0	2
	Foreign Languages * **	0	2	0	0	2
	Sport 1 **	0	2	0	0	1
	Practical Training 45 hours					2
II	Math Analysis 2	2	2	0	0	4
	Physics 2	2	0	1	0	3
	Special Mathematics 1	2	2	0	0	4
	Programming Languages and Techniques 2 **	1	0	2	0	3
	Internet-Intranet **	2	0	2	0	4
	Electrotechnics 1	4	1	1	0	5
	History of Culture and Civilization **	0.5	0.5	0	0	2
	Foreign Languages * **	0	2	0	0	2
	Sport 2 **	0	2	0	0	1
	Practical Training 45 hours					2

* A foreign language is chosen from: English, French or German.
** Coll.

Second Year of Study for Electronics (First - cycle)

Sem.	Course Title	Structure [hours/week]				Credit points
		C	S	L	P	
I	Special Mathematics 2	2	2	0	0	4
	Electrotechnics 2 **	2	1	1	0	4
	Materials and Electronic Components	3	0	1	0	4
	Electronic Devices and Circuits 1	3	1	2	0	7
	Electric and Electronic Measurements 1	3	1	1	0	6
	Foreign Language* **	0	2	0	0	2
	Sport 3 **	0	1	0	0	1
	Practical Training 45 hours					2
II	Computer assisted design **	2	0	1	0	3
	Electronic Devices and Circuits 2	3	1	1	1	6
	Optical Electronics	2	0	2	0	4
	Signals, Circuits and Systems 1	3	0	3	0	6
	Digital Integrated Circuits 1	3	1	1	0	5
	Economy 1 **	2	1	0	0	3
	Sport 4 **	0	1	0	0	1
	Practical Training 45 hours					2

* A foreign language is chosen: English, French or German.
** Coll

Third Year of Study for Applied Electronics (Second - cycle)

Sem.	Course Title	Structure [hours/week]				Credit points
		C	S	L	P	
I	Signals, Circuits and Systems 2	3	0	2	0	5
	Electronic Measuring Instruments	2	0	2	0	5
	Digital Integrated Circuits 2	2	0	1	1	5
	Analog Integrated Circuits 1	3	0	2	0	5
	Microprocessor Systems Architecture ***	2	0	2	1	6
	Opt 1** Economy 2 *** Financial Analysis for Companies	1	1	0	0	2
	Practical Training 45 hours					2
II	Theory of Information Transmission	2	0	2	0	5
	Data Acquisition Systems	2	0	2	0	4
	Electronic Systems for Automatic Control	2	0	1	0	3
	Electrical Machines and Drives ***	2	0	1	0	3
	Microwaves	2	0	2	0	4
	Robotics Basics 1 ***	2	0	1	0	3
	Opt. 2* Programmed Logic Structures *** Programmable Measuring Systems Analogic Integrated Circuits 2	2	0	2	0	4
	Opt. 3** Management *** Marketing ***	1	1	0	0	2
	Practical Training 45 hours					2

* It will be chosen a course from the recommended list or a course ("Obl."or "Opt.") from the same study year from another direction.
** It will be chosen a course from the recommended list.
*** Coll.

Third Year of Study for Communications (Second - cycle)

Sem.	Course Title	Structure [hours/week]				Credit points
		C	S	L	P	
I	Signals, Circuits and Systems 2	3	0	2	0	6
	Theory of Information Transmission 1	3	0	2	0	6
	Digital Integrated Circuits 2	2	0	1	1	5
	Analog Integrated Circuits	3	0	2	0	5
	Microwaves	2	0	2	0	4
	Opt 1** Economy 2 *** Financial Analysis for Companies	1	1	0	0	2
	Practical Training 45 hours					2
II	Theory of Information Transmission 2	2	0	2	0	4
	Data Communications 1	2	0	2	0	4
	Telecommunications Circuits ***	2	0	2	0	4
	Electronic Measuring Instruments	2	0	2	0	4
	Microprocessor Systems Architecture	2	0	2	1	6
	Opt. 2* Microwave Circuits *** Electronic Supplies	2	0	2	0	4
	Opt. 3** Management *** Marketing	1	1	0	0	2
	Practical Training 45 hours					2

* It will be chosen a course from the recommended list or a course ("Obl", "Opt" or "Pack") from the same study year from another direction.
** It will be chosen a course from the recommended list.
*** Coll.

Fourth Year of Study for Applied Electronics (Second - cycle)

Sem.	Course Type	Course Title / Domain			Structure [hours/week]				Credit Points
		Power Electronics	Industrial Robots	Instruments For Measurement And Research	C	S	L	P	
I	Obl.	VLSI Circuits Design 1			3	0	2	0	5
	Obl.	Digital Structures For Processing 1			2	0	2	1	5
	Obl.	Industrial Electronics 1			3	0	2	0	5
	Obl.	Electromagnetic Compatibility			2	0	2	0	4
	Obl.	Audio-Radio-Video Systems ***			3	1	1	0	5
	Opt. 3*	Management; Marketing ***			1	1	0	0	4
	Obl.	Practical Training 45 Hours							2
II	Obl.	Industrial Electronics 2			2	0	2	1	6
	Obl.	Construction And Technology Of Electronic Equipment			3	0	1	1	6
	Pack. 1	Driving Electronic Equipment	Robots Driving	Precision Instrumentation	3	0	2	1	6
		DSP Applications In Power Electronics	Automatically Guided Vehicles	Graphical Programming	3	0	2	0	6
	Opt. 4*	Medical Electronics *** Neural Networks VLSI Circuits Design 2 Signal Processors Applications Fuzzy Systems			2	0	2	0	4
	Obl.	Practical Training 45 Hours							2

*** Coll.

Forth Year of Study for Communications (Second - cycle)

Sem.	Course Type	Course Title / Domain			Structure [hours/week]				Credit points
		Integrated Communications Systems	Communication Networks	Multimedia	C	S	L	P	
I	Obl.	Digital Processing Structures			2	0	2	1	6
	Obl.	Data Communications Networks			3	0	2	0	6
	Obl.	Thelephony Transmission 1			3	0	2	1	6
	Obl.	Radio-Communications 1			3	0	2	1	6
	Opt. 3*	Marketing *** Industrial Engineering			1	1	0	0	4
	Obl.	Practical Training							2
II	Obl.	Television			3	0	2	0	5
	Obl.	Digitally Switching Systems			3	0	2	0	5
	Obl.	Optical Communications 1			2	0	1	1	6
	Pack. 1	Integrated Digital Networks	Integrated Digital Networks	Multimedia Production	3	0	2	0	4
	Pack. 2	Radio-Communications 2	Communications Protocols	Graphics And Image Processing	3	0	2	0	4
	Opt. 4*	Power Electronics For Telecommunications *** Object Oriented Programming			2	0	2	0	4
	Obl.	Practical Training 45 Hours							2

* It will be choose a course from the recommended list or a course ("Obl", "Opt" or "Pack") from the same study year from another direction.
** It will be chosen a course from the recommended list.
*** Coll.

Fifth Year of Study for Applied Electronics (Second - cycle)

Sem.	Course Type	Course Title / Domain			Structure [hours/week]				Credit points
		Power Electronics	Industrial Robots	Instruments for Measurement and Research	C	S	L	P	
I	Pack. 3	Electronic Driving Equipment	Computer Controlled Electrical Driving	Metrology	3	0	2	1	7
	Pack. 4	Ultrasonic Electronic Systems	Electronic Equipment Testing	Microwaves and Optoelectronic Instrumentation	3	0	2	0	6
	Pack. 5	DSP Applications in Power Electronics	Artificial Vision And Pattern Recognition	Senzors and Transducers	3	0	2	1	7
	Pack. 6	CAD for Power Converters	Intelligent Sensors	Modelling and Simulation	3	0	2	1	6
	Opt. 5*	Environment Parameters Measurement *** Kinematics and Dynamics of Industrial Robots DSP in Process Control			2	0	2	0	4

* It will be chosen a course from the recommended list or a course ("Obl", "Opt" or "Pack") from the same study year from another direction.
** It will be chosen a course from the recommended list.
*** Coll.

Fifth Year of Study for Communications (Second - cycle)

Sem.	Course Type	Course Title			Structure [hours/week]				Credit points
		Domain							
		Telecommunications Integrated Systems	Communication Networks	Multimedia	C	S	L	P	
I	Pack. 3	Communications Software	Communications Software	Multimedia Databases	3	0	2	1	7
	Pack. 4	Communication Equipment Testing	Telecommunications Traffic	Audio-Video Compression	3	0	2	0	6
	Pack. 5	Mobile Communications	Networks Optimisation	Audio-Video Production	3	0	2	0	7
	Pack. 6	Digital Switching Systems 2	Adaptive Signal Processing	Recording Techniques	3	0	2	0	6
	Opt. 4*	Telecommunications Terminals Radiorelays And Satellite Communications Modern Telecommunications Techniques Internet Information Transmission Security			2	0	2	0	4

* It will be choosen a course from the recommended list or a course ("Obl", "Opt" or "Pack") from the same study year from another direction.

** It will be choosen a course from the recommended list.

Note: in the examination modes, (E) means examination and (C) means continuous assessment

As mentioned above, in 2005 a new curriculum has been introduced, for the License-Master-Doctorate system, according to the Bologna Declaration. The License level curriculum has been adopted and followed at this moment by students from the first year. This curriculum follows.

Field: Electronic Engineering and Telecommunications

No.	Teaching Line	C	S	L	P	Ex	Cr.
First Year First Semester							
1	Math Analysis	2	2			E	4
2	Algebra and Geometry	2	2			E	4
3	Mechanical Engineering Fundamentals	2		1		DE	3
4	Computer Practice	2		2		DE	4
5	Electrical Circuits	2	1	1		DE	5
6	Materials, Components and Electronic Technology	2	1	1		E	4
7	Foreign Languages*		2			DE	2
8	Sport		1			DE	1
9	Practical Training					C	2
	Total	12	9	5		26	29
First Year Second Semester							
1	Special Mathematics	2	2			E	4
2	Computer Assisted Mathematics	2	1	1		DE	4
3	Physics	2	1	1		E	4
4	Optoelectronic and Electronic Devices	3		2		E	6
5	Computer Programming	2		2		DE	4
6	Electric and Electronic Measurements	2	1	1		E	4
7	Foreign Languages*		2			DE	2
8	Sport		1			DE	1
9	Practical Training					C	2
	Total	13	8	7		28	31

***A foreign language is chosen from: English, French or German.**

Field: Electronic Engineering and Telecommunications

No.	Teaching Line	C	S	L	P	Tot	Cr.
Second Year Third Semester							
1	Digital Integrated Circuits	2		2			4
2	Computer Network Architecture	2		2			4
3	Fields and Electromagnetic Waves	2	1	1			4
4	Signals and Systems	2	1	1			4
5	Culture and Civilization	1	1				2
6	Fundamental Electronic Circuits	2		2			5
7	Computer Aided Design	2		2			4
8	Sport		1				1
9	Practical Training						2
	Total	13	4	10		27	30
Second Year Fourth Semester							
1	Microeconomics	2	1				4
2	Signal Processing	2		2			5
3	High Frequency Technique	2	1	1			4
4	Processor Based on Digital Processing Systems	2,5	0,5	2			5
5	Analogic Integrated Circuits	2		2			4
6	Object Oriented Programming	2		2			4
7	Electronic Circuits Project				2		2
8	Practical Training						2
	Total	13	2	9	2	26	30

Field: Electronic Engineering and Telecommunications - Specialization: Applied Electronics

No.	Teaching Line	C	S	L	P	T	Cr
Third Year Fith Semester							
1	Management and Marketing	2	2				4
2	Industrial Electronics	2	1	1			5
3	Data Acquisition Systems	2		2			5
4	Programmable Logic Structures	2		2			4
5	Radio-Audio-Video Communications	2		2			4
6	Electronic Measuring Instruments	2		2			4
7	Decide on a teaching line from another specialization	2		2			4
8	Practical Training						2
	Total	14	3	11	0	28	32
Third Year Sixth Semester							
1	Construction and Technology of Electronic Equipment	2		2			5
2	Switching Power Electronics	2		2			5
3	Electronic Equipment Testing	2		2			4
4	Robotics Basics	2		2			4
5	Electromagnetic Compatibility	2		2			4
6	Decide on a teaching line from another specialization	2		2			4
7	Practical Training						2
	Total	12	0	12	0	24	28

Field: Electronic Engineering and Telecommunications - Specialization: Applied Electronics

No.	Teaching Line			C	S	L	P	T	Cr
Fourth Year Seventh Semester									
1	Electronic Driving Systems	Electronic Driving Systems	Precision Instrumentation	3		2			6
2	Non-pollutant Converters	Mobile Robots	Medical Electronics	3		2			6
3	Algorithms and Methods for Numerical Control	Automatic Control Systems	Metrology and Quality	3		2			6
	External lectures			2		2			3
5	Decide on a teaching line from another option			3		2			5
6	Processors Project						2		4
	Total			14	0	10	2	26	30
Fourth Year Eigth Semester									
1	Interface Electronic Equipments	Sensors and Transducers	Sensors and Transducers	2		2			3
2	Energy Converters Modelling and Simulation	Artificial Vision	Microwaves and Optoelectronic Instrumentation	2		2			3
3	Ultrasonic Electronic Systems	Robots Driving	Virtual Instrumentation	2		2			3
4	Decide on a teaching line from another option			2		2			3
5	Software Project						2		3
6	DIPLOMA						8		15
	Total			8		8	2	26	30

Field: Electronic Engineering and Telecommunications - Specialization: Telecommunications

No.	Teaching Line	C	S	L	P	T	Cr
Third Year Fifth Semester							
1	Management and Marketing	2	2				4
2	Information Theory and Coding	2	1	1			5
3	Data Communications	2		2			5
4	Telecommunications Circuits	2		2			4
5	Power Electronics	2		2			4
6	Measurements in Telecommunications	2		2			4
7	Decide on a teaching line from another specialization	2		2			4
8	Practical Training						2
	Total	14	3	11	0	28	32
Third Year Sixth Semester							
1	Decision and Estimation in Information Theory	2		2			5
2	Radio-Communications Basics	2		2			5
3	Telephony Transmission	2		2			4
4	Digital Switching Systems	2		2			4
5	Television Systems	2		2			4
6	Decide on a teaching line from another specialization	2		2			4
7	Practical Training						2
	Total	12	0	12	0	24	28

Field: Electronic Engineering and Telecommunications - Specialization: Telecommunications

No.	Teaching Line		C	S	L	P	T	Cr
Fourth Year Seventh Semester								
1	Radio-Communications Systems	Communications Protocols	3		2			6
2	Telecommunication Equipment Testing	Telecommunications Traffic	3		2			6
3	Integrated Digital Networks	Integrated Digital Networks	3		2			6
	External lectures		2		2			3
5	Decide on a teaching line from another option		3		2			5
6	Processors Project					2		4
	Total		14	0	10	2	26	30
Fourth Year Eigth Semester								
1	Mobile Communications	Networks and Applications Security	2		2			3
2	Optical Communications	Networks Optimisation	2		2			3
3	Telecommunications Software	Telecommunications Software	2		2			3
4	Decide on a teaching line from another option		2		2			3
5	Software Project					2		3
6	DIPLOMA					8		15
	Total		8		8	2	26	30

Field: Electronic Engineering and Telecommunications - Specialization: Audio-Video and Multimedia Technologies

No.	Teaching Line	C	S	L	P	T	Cr
Third Year Fifth Semester							
1	Management and Marketing	2	2				4
2	Information and Coding Theory	2	1	1			5
3	Multimedia Technologies	2		2			5
4	Multimedia Basics	2		2			4
5	Radio-Audio-Video Communications	2		2			4
6	Measurements in Telecommunications	2		2			4
7	Teaching line from another specialization	2		2			4
8	Practical Training						2
	Total	14	3	11	0	28	32
Third Year Sixth Semester							
1	Computer Graphics	2		2			5
2	Audio-Digital Production	2		2			5
3	Multimedia Applications Development	2		2			4
4	Dabases Structures	2		2			4
5	Television Systems	2		2			4
6	Teaching line from another specialization	2		2			4
7	Practical Training						2
	Total	12	0	12	0	24	28
Fourth Year Seventh Semester							
1	Audio-Video Compression	3		2			6
2	Multimedia Databases	3		2			6
3	Digital Video Production	3		2			6
4	External lectures	2		2			3
5	Teaching line from another option	3		2			5
6	Multimedia Project				2		4
	Total	14	0	10	2	26	30
Fourth Year Eigth Semester							
1	Networks and Applications Security	2		2			3
2	Artificial Vision	2		2			3
3	E-content Applications	2		2			3
4	Teaching line from another option	2		2			3
5	Software Project				2		3
6	DIPLOMA				8		15
	Total	8		8	2	26	30

3.3. The "Master" level

This program is intended for the best graduates of the "Licensed engineer" level with the purpose of training young engineers for research activity. Only graduates of the "Diploma Engineer" level with a final grade of 8/10 can be admitted to this level.

Thus, the educational activity in this level is treated by the teaching staff with increased care. From the graduates of this level, young engineers are selected to be the next generation of professors and research staff of our faculty.

The goals of this program are:

- to familiarize the young engineers with the permanent intellectual activity;
- to stirr the scientific curiosity of the students, but also to get them used to the stresses and accuracy of scientific research;
- to give students the opportunity to work individually, as well as in a team;
- to get students accustomed to research activity.

The structure of this program is similar to that of the "Licensed engineer" program. The main features are:

- deep individual study;
- 1 year period of study (extended to 2 years for the LMD system);
- the students (young engineers) graduate this level with a dissertation.

Each of the three faculty departments offers at least one "Master" program:

- **Applied Electronics:** ***"Electronics of Intelligent Industrial Systems",***
- **Communications:**
  - ***"Adaptive Digital Signal Processing of Telecommunication Signals"***
  - ***"Traitement du Signal"*** (Signal processing), in French
- **Measurement and Optical Electronics:** ***"Electronic Instrumentation"***

Starting with the academic year 2005-2006, a new 2-year Master program has been introduced, following requests from our economic partners: Advanced Design and Testing Techniques in Electronics. The curriculum is oriented to PCBA design and production, process test and control applications development, and test and measuring systems up to radiofrequencies.

Number of students 2005/2006

	Total number	Graduated	Drop out
EIIS	20	13	7
ADPTS	14	10	4
EI	11	6	5
TS	15	11	4
ADTTE	20	14	6

Curriculum for the Academic Year 2005-2006

Electronics of Inteligent Industrial Systems

Sem.	Course Title	Structure [hours/week]				Credit points
		C	S	L	P	
I	Fuzzy Systems. Applications in Automatic Control	2	0	1	1	7
	High Frequency Power Processors. Analysis and Modelling	2	0	2	1	7
	Computer Aided Design of Applications Oriented Integrated Circuits	1	0	2	1	6
II	Processing Techniques with Neural Networks in Robotics	2	0	2	1	7
	Statistical Signal Processing Algorithms / Flexible Manufacturing Systems	3	0	2	1	7
	Functional Parameters Optimization of Energy Conversion Electronic Systems	2	0	1	1	6
	Disertation Exam					20

Adaptive Digital Processing for Telecommunications Signals

Sem.	Course Title	Structure [hours/week]				Credit points
		C	S	L	P	
I	Modern Communication Networks 1	2	0	2	0	7
	Engineering and Security of Radio Digital Communications	2	0	2	0	7
	Adaptive Signal Processing	2	0	2	0	6
II	Modern Communication Networks 2	2	0	2	0	7
	Digital Signals Detection and Estimation	2	0	2	0	7
	Multimedia Architectures and Processing	2	0	2	0	6
	Disertation Exam					20

Electronic Instrumentation

Sem.	Course Title	Structure [hours/week]				Credit points
		C	S	L	P	
I	General Theory of Measurement	2	0	2	0	7
	Signal Processors in Measurement Instrumentation	2	0	2	0	7
	Measuring Systems in Electromagnetic Compatibility	2	0	2	0	6
II	Methods and Algorithms for Spectral Estimation	2	0	2	0	7
	High Frequency Instrumentation	2	0	2	0	7
	Fuzzy Logic and Neural Networks	2	0	2	0	6
	Disertation Exam					20

Signal Processing (*Traitement du Signal - in French*)

Sem.	Course Title	Structure [hours/week]				Credit points
		C	S	L	P	
I	Wavelet Functions Theory	2	0	2	0	7
	Adaptive Signal Processing	2	0	2	0	7
	Image Processing	2	0	2	0	6
II	Modern Telecommunications Techniques	2	0	2	0	7
	Mathematical Morphology	2	0	2	0	7
	Statistical Signal Processing	2	0	2	0	6
	Disertation Exam					20

Advanced Design and Testing Techniques in Electronics

FIRST SEMESTER			
Course Title	Structure [hours/week], 14 weeks C S L P	Evaluation	Credit Points
PCBA design and manufacturing	2 0 2 0	E	8
PCBA design and manufacturing (project)	0 0 0 2	P	4
Radio-frequency measurements	2 0 2 0	E	8
Modern programming techniques	1 0 1 0	E	4
Digital communications	2 0 1 0	E	6
TOTAL	**7 0 6 2**		**30**

SECOND SEMESTER			
Course Title	Structure [hours/week], 14 weeks C S L P	Evaluation	Credit Points
Test and measurements interfacing systems	3 0 2 0	E	8
Statistical methods for process control	2 0 1 0	E	4
Virtual instrumentation	2 0 1 2	E	8
Elaboration of the M.Sc. Thesis (**)			10
TOTAL	**7 0 4 2**		**30**

3.4. The "PhD Engineer" level

The Ph.D. degree, in the field of Electronics and Telecommunications, is the highest that can be attained in a course of study at our faculty. The purpose is to certify the qualities as a "Scientific Researcher" of the participants in this program.

The first step of this training program is the admission examination. After passing this examination, there are further three or four examinations in specific subjects to be taken. Having successfully passed these examinations the doctoral candidates must present two or three essays about their research activity in faculty meetings, thus giving others the opportunity to familiarize with their research activity and to debate upon their scientific preoccupations. Candidates can complete the Ph.D. degree in three to six years (limited to three years in the LMD system). The last step of this program is the elaboration and oral defense of the Ph. D. thesis.

The goals of this educational program are:

- to familiarize the candidates with the latest results in their field of study. The thesis must provide original contributions in the research field;
- to develop the theoretical background and practical skills of the candidates with respect to the research field and their original thinking manner;
- to disseminate the preoccupations of our research staff on national and international scale.

Starting with 1998, some of our Ph.D. students are preparing their Ph.D. thesis in a co-tutelary system, having two Ph.D. advisor professors, one from our faculty and one from abroad (usually from a West European University).

PHD ADVISORS

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

PhD students:

- Alexandru DARIE: *Optimizing the Performance of a Mobile Robot Society.*
- Ciprian GAVRINCEA: *Researches on a Neural Network Implementation for Processing the Signals Generated by Muscle System.*
- Liviu LUCACIU: *Contributions to the Biometric Systems Development and Implementation.*
- Marian BURSAŞIU: *Contributions to the Optimization of Neural Network Applications Development.*
- Alin BRÎNDUŞESCU: *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*
- Ioan GAVRILUȚ: *Contributions to the Autonomous Mobile Robot Navigation Using CNN*

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

3. Scientific supervisor: Prof.dr.eng. Mircea CIUGUDEAN
PhD students:
- Aurel FILIP: *Researches on CMOS Frequency References*
- Marllene 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.*

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*
- Corina IVAN: *Energy parameters optimization in dc-dc converters*
- Marin TOMȘE: *Contributions to theoretical and experimental study of inductive heating power supplies*
- Daniel ALBU: *Contributions regarding improved capabilities of switched mode converters with PFC applications*
- Dorin CIZMAȘIU: *Power factor control in ac-dc conversion systems*

- Dan SIMU: *Adaptive systems for unconventional technologies*
- Lucian PĂUN: *DC/DC converters with optimized energy parameters*
- Adrian ŞCHIOP: *Contributions to theoretical and experimental study of power converters with ac motor drive applications*
- Cristian VRÂNCILĂ: *Theoretical and experimental contributions regarding active power filters*

5. Scientific supervisor: Prof.dr.eng. Horia 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 MIŢARIU: *Contributions to the improvement of autotesting equipment in digital data conditioning and transmission*
- Mirel BURLACU: *Research regarding CMOS analog integrated circuits based on unconventional principles*
- Corneliu TRIPA: *Contributions to the development of fault diagnose and identification tests in applied electronics equipment*
- Mircea RIF: *Automated system for data acquisition, processing and management in industry*
- Mircea MIHĂESCU: *Contributions to the development of dynamical diagnose and reconfiguration tests in digital fault redundant systems*
- Liviu ION: *Contributions to the development of digital regulation in electrical driven industrial processes*
- 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 CHIŞ: *Contributions to pattern recognition test development in automated visual control.*
- Călin SÂRBU: *Contributions to predictive test development concerning electrostatic discharge in electronic industry.*

6. Scientific Supervisor: Prof. dr. eng. Ioan NAFORNIŢĂ

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*
- Ciprian DAVID, *Contributions on faults detection using image processing techniques*
- 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.

7. Scientific Supervisor: Prof. dr. eng. Miranda NAFORNIȚĂ
PhD students:

- Horia BALTA, *Hierarchical coding for spread spectrum transmission systems*
- Radu LUCACIU, *Optical communication systems with OCDMA*
- Maria KOVACI, *N-PSK multiresolution modulations in the COFDM hierarchical systems*
- Caius ULITA, *Equalizers for radio channel modems*
- Mirela VIOR, *Quality transmission improvement using turbo codes*
- Sorin POPA, *Synchronization techniques improvement for radio channel transmission systems*
- Marius OLTEAN, *Radio channel equalization using cyclic prefix*
- Florin Lucian MORGOS, *Radio channels equalization techniques improvement*

8. Scientific Supervisor: Prof. dr. eng. Alexandru ISAR
PhD students:

- Ioana ADAM, *Phd Title: The despecklisation of SONAR images by multi-resolution filtering*

Mircea BORA, *Phd Title: The Signal to Noise Ratio Enhancement in Communication Systems Using Wavelets*

Scientific Supervisor: 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. IOANEȘIU: *Contributions at the network security by the using of the virtual private networks (VPN).*

- Daniel C. HAIDUC: *Contributions in the color digital reproduction field .*
- Constantin M. BUCOS: *Modeling and analysis of mobile virtual organizations.*
- Radu TĂNASE: *Ultrasound electronic systems for the movement evaluation in the fluid environment .*
- Mihai I. ONIȚĂ: *Video communications in multimedia applications.*
- Mircea TOMOROGA: *Contributions at the conception and design of the analog integrated circuits in CMOS technology*
- Florin-Josef LĂTĂREȚU: *Contributions at the intelligent telecommunication network achievement.*
- Daniela Narcisa FUIOREA – BULUCEA: first year student
- Alin SCOROŞANU: first year student

9. Scientific Supervisor: Prof. dr. eng. Marius OTEŞTEANU
PhD students:
- Sandra RUGINA
- Georgiana SÂRBU-DOAGĂ
- Hay BOENKE
- Daniel POPA

10. Scientific Supervisor: Prof.dr.eng. Radu VASIU
PhD students:
- Iasmina ERMALAI, *Contributions to the Use of New Information Technologies in e-Learning*
- Artur SRAUM, *Contributions to Interactive Web Programming*
- Cristian TECU, *Contributions to the Use of Video, Photo and Audio Applications in Professional Presentations*
- Andrei TERNAUCIUC, first year student
- Virgil ROTARU, first year student

11. Scientific Supervisor: Prof.dr.eng. Eugen POP
PhD students:
- Liliana STOICA: *Contributions to Digital Signal Processing*

12. Scientific Supervisor: Prof. dr. eng. Sever CRIŞAN
PhD students:
- Octavian LUCA: *Spectral analysis of bioelectrical signals*
- Ovidiu VETRES: *Perturbations study of low frequency electromagnetic fields*

13. Scientific Supervisor: Prof.dr.eng. Alimpie IGNEA
PhD students:

- 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.*
- Raul IONEL: *Contributions to noise sources detection algorithms using virtual instrumentation*
- Michael KLEINKES (Germany): *Mathematical analysis of off-line programmed robots in industrial application cells*

PHD THESIS DEFENDED

1. Valentin I. MARANESCU *Contributions to the improvement of voltage stabilizers performances using interconnected integrated voltage regulators*, PhD Advisor: Prof. dr. eng. Corneliu TOMA.

2. Codruţ N. Ianăşi, *Nonparametric density estimation technigues for background substraction in video surveillance*, PhD Advisor: Prof. dr. eng. Corneliu TOMA.

3. Ioan LIE, *Contributions to the Optimization of the Methods and Electronic Equipments for Ultrasonic Investigation*, PhD Advisor: Prof.dr.eng. Tiberiu MUREŞAN.

4. Dan Simu: *Contributions in Configuring Automated Testers Structures with Applicability in Avionics*, PhD Advisor: Prof.dr.eng. Viorel POPESCU

DOCTORAL PREPARATION ESSAYS

1. Aurel FILIP, *High-frequency RC oscillators applied in the transducer interface*, PhD Advisor: Prof.dr.eng. Mircea CIUGUDEAN.

2. Andy BERCOVICI, *Circuit elements in hybrid integrated circuits technology*, PhD Advisor: Prof.dr.eng. Horia CÂRSTEA.

3. Andy BERCOVICI, *Reliability, mentenability and availability management of electronic equipment*, PhD Advisor: Prof.dr.eng. Horia CÂRSTEA.

4. Dumitru MĂRGELOIU, *Strategies of fault tolerance implementation in digital electronic systems*, PhD Advisor: Prof.dr.eng. Horia CÂRSTEA.

5. Dumitru MĂRGELOIU, *Actual stage of autotesting electronic equipment*, PhD Advisor: Prof.dr.eng. Horia CÂRSTEA.

6. Dumitru MĂRGELOIU, *Error detecting and correcting codes for fault protective redundance implementation in autotesting electronic equipment*, PhD Advisor: Prof.dr.eng. Horia CÂRSTEA.

7. Lucian PĂUN, *Electrical energy converters,* PhD Advisor: Prof. dr. eng. Viorel POPESCU.

8. Lucian PĂUN, *Non-dissipative commutation converters,* PhD Advisor: Prof. dr. eng. Viorel POPESCU.

9. Marin TOMŞE, *Own realisations concerning the optimisation of inductive heating sources*, PhD Advisor: Prof. dr. eng. Viorel POPESCU.

10. Ciprian GAVRINCEA, *Actual research regarding the implementation of a neural network for processing the signals generated by the muscle and nervous system,* PhD Advisor: Prof. dr. eng. Virgil TIPONUȚ.

11. Ciprian GAVRINCEA, *Analysis of solutions for implementation of a neural network dedicated to muscle signal processing*, PhD Advisor: Prof. dr. eng. Virgil TIPONUȚ

12. Ciprian GAVRINCEA, *Theoretical and experimental results regarding the implementation of a neural for processing the signals generated by the muscle and nervous system,* PhD Advisor: Prof. dr. eng. Virgil TIPONUȚ

13. Ionuț MIREL, *Image deinterlacing methods*, PhD Advisor: Prof. dr. eng. Virgil TIPONUȚ

14. Ionuț MIREL, *New solutions for image filtering and rescaling*, PhD Advisor: Prof. dr. eng. Virgil TIPONUȚ.

15. Ionuț MIREL, *Contour detection methods*. Nonlinear image processing, PhD Advisor: Prof. dr. eng. Virgil TIPONUȚ.

16. Janos GAL, *Kalman filtering,* PhD Advisor:: Prof. dr. eng. Ioan NAFORNIȚĂ;

17. Romulus REIS, *Use of time-frequency representations for non-stationary signal description*, PhD Advisor: Prof. dr. eng. Ioan NAFORNIȚĂ;

18. Sorin POPA, *Radio Transmission Systems Syncronization Methods,* PhD Advisor: Prof. dr. eng. Miranda NAFORNIȚĂ;

19. Florin Lucian MORGOS, *Radio Channels,* PhD Advisor: Prof. dr. eng. Miranda NAFORNIȚĂ;

20. Radu LUCACIU, *Optical systems with OCDMA performance analysis*, PhD Advisor: Prof. dr. eng. Miranda NAFORNIȚĂ;

21. Mihai I. ONIȚĂ, *Mobile telephony and internet networks streaming technology*, PhD Advisor: Prof. dr. eng. Corneliu TOMA.

22. Daniel C. HAIDUC, *The present and outlook stage in the image display technologies*, PhD Advisor: Prof. dr. eng. Corneliu TOMA.

23. Daniel C. HAIDUC, *Calibration of the image displays. Color management systems*, PhD Advisor: Prof. dr. eng. Corneliu TOMA.

24. Mircea TOMOROGA, *The models of the digital-to-analog converter using in the design,* PhD Advisor: Prof. dr. eng. Corneliu TOMA.

25. Mirela L. IOANEŞIU, *Data security by cryptography,* PhD Advisor: Prof. dr. eng. Corneliu TOMA.

26. Mirela L. IOANEȘIU, *VoIP service extension using adaptive personal mobile communication*, PhD Advisor: Prof. dr. eng. Corneliu TOMA.

27. Sandra RUGINĂ, *Analysis, Modeling and Measuring Rain Characteristics,* PhD Advisor: Prof. dr. eng. Marius OTEŞTEANU;

28. Georgiana SÂRBU-DOAGĂ, *Study of Functions and Components Required for Building a Rain Simulator,* PhD Advisor: Prof. dr. eng. Marius OTEŞTEANU;

29. Sandra RUGINĂ, *Software Envorniment for the Laster Precipitation Monitor,* PhD Advisor: Prof. dr. eng. Marius OTEŞTEANU;

30. Georgiana SÂRBU-DOAGĂ, *Programming Siemens Simatic S7-200. LabView-PLC Communication, PhD* Advisor: Prof. dr. eng. Marius OTEŞTEANU.

31. Iasmina ERMALAI, *The Use of New Information Technologies in e-Learning,* PhD Advisor: Prof. dr. eng. Radu VASIU.

32. Cristian TECU, *The Use of Video, Photo and Audio Applications in Professional Presentations,* PhD Advisor: Prof. dr. eng. Radu VASIU.

33. Gabriel GĂŞPĂRESC, *Soft Programms for Data Compression*, May 2006, PhD Advisor: Prof. dr. eng. Alimpie IGNEA.

34. Adrian MIHĂIUȚI, *Antennas Characteristics Measurements*, PhD Advisor: Prof. dr. eng. Alimpie IGNEA.

35. Teodor PETRIȚA,: *Radiofrequency Perturbations Monitoring*, PhD Advisor: Prof. dr. eng. Alimpie IGNEA.

36. Adrian MIHĂIUȚI, *Nonlinearity Antennas Study*, PhD Advisor: Prof. dr. eng. Alimpie IGNEA.

37. Raul IONEL, VIRTUAL INSTRUMENTATION – Actual Stage and Perspectives, PhD Advisor: Prof. dr. eng. Alimpie IGNEA.

38. Raul IONEL, *Automated Spectral Analysis of Noise Sources Generated Signals*, PhD Advisor: Prof. dr. eng. Alimpie IGNEA.

39. Michael KLEINKES, *Frequency Analysis of 3-Dimensional Movements*, PhD Advisor: Prof. dr. eng. Alimpie IGNEA.

40. Michael KLEINKES, *Accuracy Effecting Elements in the Drive-Train of Industrial Robots*, PhD Advisor: Prof. dr. eng. Alimpie IGNEA.

41. Michael KLEINKES, *Application of Denavit-Hartenberg Parameters for Forward and Reverse Robot Kinematics*, PhD Advisor: Prof. dr. eng. Alimpie IGNEA.

PHD Theses Sustained in Department Meetings

- Ciprian GAVRINCEA: *Researches on a Neural Network Implementation for Processing the Signals Generated by Muscle System.*
- Ionuț MIREL: *Methods for Digital Video Images Processing.*

4. Research

The research activity is performed within two Research Centers and various research teams, as follows.

4.1 Intelligent Industrial Electronic Systems - IIES Research Center

The center IIES director is:
Prof.PhD.Eng. Mircea CIUGUDEAN.
Web page: http://www.etc.utt.ro/ea
E-mail: mircea.ciugudean@ etc.utt.ro.
The center functions in accordance with certificate CNCSIS, nr. 106/CC-C/11.05.2001..

RESEARCH PROJECTS, CONTRACTS AND GRANTS

1. CNCSIS grant A, nr. 639
Integrated environment for assisted movement of visualy impaired persons
Value: 30,000 RON
Director: Prof. dr. eng. Virgil TIPONUT
Members:
Prof. dr. eng. Alexandru GACSADI
Assoc. prof. dr. eng. Stefan ONIGA
Lect. eng. Calin LAR
Lect. Eng. Ioan GAVRILUT
Lect. Eng. Ciprian GAVRINCEA
Assist. Eng. Laviniu TEPELEA

FIELD AND GRANT DESCRIPTION

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

ACTIVITIES AND RESULTS

The research activity within the project has been focused in this year in the following main area of interest:

- Development of a sensorial module capable to give information on the presence and the position of obstacles in front of the subject; the same unit is

responsible for the attitude of the blind person (the position of the head in both horizontal and vertical plains),
- Development of the supervising system, which monitors the position of the subject in his movement to reach the target,
- Research and experiments in order to develop a simple and efficient man-machine interface that will allow the communication between the subject and the electronic system.

A wearable prototype that meets all the above requirements will be developed by the end of this year.

2. CNCSIS grant A, nr. 2739/ 19.05.2006, theme 8, CNCSIS code 351
Image quality improvement in sonar systems by speckle noise reduction

Value: 9500 RON
Director: Assoc. prof. dr. eng. Dorina ISAR
Members: Prof. dr. eng. Sabin IONEL
Prof. dr. eng. Andrei CÂMPEANU
Prof. dr. eng. Alexandru ISAR
Lect. dr. Eng. Cornel BALINT
Assist. eng. Sorin POPESCU
Assist. eng. Maria KOVACI
Assist. eng. Andy VESA
Assist. eng. Marius SĂLĂGEAN
PhD Stud. Ioana ADAM
PhD Stud. Mircea BORA

FIELD AND GRANT DESCRIPTION

The images obtained using a set of sound or ultrasound transducers such the SAR images used in aerial navigation or the sea floor images acquired with sonar or the echo graphic images are perturbed by a multiplicative acquisition noise, called speckle noise. For the correct interpretation of the information contained in these images, the enhancement of the quality of those images, based on the rejection of the speckle noise is required. For this purpose the wavelets theory is used more often today. An algorithm dedicated to the reduction of the speckle noise has the following steps: the speckle noise is transformed into an additive noise by the computation of the logarithm of the acquired image; the discrete wavelet transform of the obtained result is then computed; then the non-linear filtering of the new result is performed, reducing the noise; the inverse discrete wavelet transform is then computed and the anti-logarithm of the new result is computed. So, the noise-free estimation of the acquired image is obtained. The purpose of our grant is to match this denoising algorithm to the specificities of the sea floor images acquired with sonar images: the statistics of the information contained, the

statistics of the speckle noise, the time required for acquisition. The results obtained will be used for the realization of some computing programmes dedicated to the use of geologists for the interpretation of sea floor images, to study the tectonic changes, for the appreciation of the age of different components or of the relief modifications tendencies or for the ecology or military control of different regions. The performances of those programmes will be superior to the performances of the programmes already conceived, affecting less the statistics of the useful image contained into the images to be processed, being faster and using less memory.

ACTIVITIES AND RESULTS

Our researches concentrated this year on the choice of the best wavelet transform for sonar image processing. At the beginning we had used the enhanced diversity wavelet transform, DEDWT, invented in our research team few years ago. Using this transform we decreased the sensitivity of the discrete wavelet transform with respect to the mother wavelet involved. Some diversification mechanisms were developed in the paper "Alexandru Isar, Sorin Moga, Corina Naforniţă, Marius Oltean, Ioana Adam, *Image Denoising Using Wavelet Transforms With Enhanced Diversity*, Proceedings of International Conference Communications 2006, Bucharest, June, 3-4, 2006."
The theoretical proof for the synthesis of partial results used in DEDWT computation can be found in "Quinquis A., Isar D., Isar A., *Multi-scale MAP Denoising of SAR Images*, Proceedings of IEEE International Conference Oceans'06, Boston, USA, September 20-23", because SAR images represent a more general case that SONAR images.
Later we found more useful a complex wavelet transform, namely the double tree complex wavelet transform, DTCWT. Its use for denoising SONAR images is treated in the paper "Alexandru Isar, Dorina Isar, Ioana Adam, *Denoising Sonar Images*, Proceedings of The Romanian Academy, Series A, Volume 7 , Number 2 May - August 2006, pp. 1-14", where we presented a comparison between our results and the results obtained using classical filters for SONAR images denoising, i.e. Lee and Frost filters. Discussing the subject whit the members of a research team from IFREMER Brest in France we agreed that the results obtained using DTCWT are better because it is a translation quasi-invariant transform with an enhanced directional selectivity. But the complex transform is very sensitive with the choice of wavelet mother. Consequently we proposed ourselves an other objective: the design of diversity enhanced complex wavelet transform. The one-dimensional form of this transform, invented in our research team, was published in Proceedings of International Symposium ETc 2006:
"I. Adam, M. Oltean, M. Bora, *A New Quasi Shift Invariant Non-Redundant Complex Wavelet Transform,* Proceedings of International Symposium ETc 2006, September 21-22, 2006, Timişoara".

3. CNCSIS grant AT MedC, AT41, nr. 2739/ 19.06.2006 C SHARP/DOT NET Implementation for a Facial Detection and Recognition Neural System.

Value: 20,000 RON
Director: Lect. dr. eng. Cătălin-Daniel CĂLEANU
Members: Lect. dr. eng. Muguraş MOCOFAN
Lect. dr. eng. Adrian AVRAM
Assist. dr. eng. Valentin MARANESCU
Radu CACIORA, student
Adrian HAREA, student

FIELD AND GRANT DESCRIPTION

The aim of this project is to develop a system for automatic face detection and recognition using a new and powerful programming language and technology, namely C Sharp and DOT NET. It is based on one of the most promising Artificial Intelligence's paradigm – Neural Networks, combined with advanced digital image processing techniques, e.g. Gabor filters. The motivations underlying chosen software are in relation with the need of a real time operation mode and a versatile implementation of the following stages required by above mentioned system: interfacing videocapturing devices and manipulate video streams; image acquisition and theirs Internet broadcasting; image processing; object oriented neural networks implementation; Internet services; create/access/maintain multimedia databases. Among applications of such facial detection and recognition system, are: continuous monitoring of public places, e.g. rail stations, airports, in order to locate certain individuals, searching large mug shot databases, sensitive areas access control, etc.

ACTIVITIES AND RESULTS

The knowledge dissemination of the research activity was done by proposing the following papers to some international journals and conferences:

1. C.D. Căleanu, C. Botoca, "C# Solutions for a Face Detection and Recognition System", FACTA UNIVERSITATIS, Ser. Elec. Energ., Nis, Yugoslavia, 2006.
2. C.D. Căleanu, V. Gui, F. Alexa, "Face Recognition via Direct Search Optimized Gabor
Filters", The 5th WSEAS International Conference on System Science and Simulation in Engineering, (ICOSSE'06) Tenerife, Canary Islands, Spain, December 16-18, 2006 - accepted paper, to be
printed in dec. 2006.

3. C. D. Căleanu, V. Gui, F. Alexa, Direct Search Optimized Feature Extraction, WSEAS Transactions on Systems and Control, 2006 – accepted paper, to be printed in dec. 2006.

All above mentioned papers have been accepted for publishing. The following paper was proposed for publishing into a Romanian Academy journal and is still currently under evaluation:

1. C. D. Căleanu, G. Pradel, V. Maranescu, F. Alexa, "Combined Pattern Search Optimization of Feature Extraction and Classification Parameters in Facial Recognition", Romanian Journal of Information Science and Technology, 2006.

INTERNATIONAL CONTRACTS AND GRANTS

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

Program: EU Sixth Framework Programe
FP6- 017146, 2005

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

Value for the ETc Faculty, 2006: 2000 EURO

Director: Prof. dr. eng. Ivan BOGDANOV

Members:Prof. dr. eng. Tiberiu MURESAN
Prof. dr. eng. Virgil TIPONUT
Prof. dr. eng. Vasile GUI
Prof. dr. eng. Alimpie IGNEA
Prof. dr. eng. Dan STOICIU
Lect. dr. eng. Cătălin CĂLEANU
Assist. eng. Dan ANDREICIUC

Partners:

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

FIELD AND GRANT DESCRIPTION

The project concerns about the novel concept "skill-based manufacturing", i.e. production units with embedded knowledge about their skills being able to interact to solve a given manufacturing task. Given the situation of the existing highly automated

manufacturing systems, the automate design and/or reconfiguration of the known manufacturing systems has to be achieved.

ACTIVITIES AND RESULTS

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

Contact person:
Prof. Ivan Bogdanov
Tel: +40-256-403338
E-mail: ivan.bogdanov@etc.upt.ro

5. LEONARDO DA VINCI
Community Vocational Training Action Programme
***E-learning Distance Interactive Practical Education (EDIPE)* CZ/06/B/PP-168022**
Value: 25,000 EURO
Director: Assoc. prof. dr. eng. Dan LASCU
Members: Prof.dr. eng. Viorel POPESCU
Assoc. prof. dr. eng. Mihaela LASCU
Lect. dr. eng. Adrian POPOVICI
Lect. dr. eng. Dan NEGOIȚESCU
Lect. dr.eng. Adrian POPOVICI
Assist. eng, Mircea BĂBĂIȚĂ
Partners:

1. Technical University of Brno
2. Technische Universiteit Delft
3. Technische Universität Wien
4. Institut für Elektrische Antriebe und Maschinen, Wien
5. Ruhr Universität Bochum
6. National Technical University of Athens
7. Institut National Polytechnique de Lorraine
8. Budapest Muszaki es Gazdasagtudomanyi Egyetem
9. Simulation Research CASPOC.
10. "Politehnica" University of Timişoara, Romania.

11. Fakulta elektrotechniky a informatiky Technická univerzita V Košiciach, Slovakia
12. Trencianska Univerzita Alexandra Dubceka v Trencine, Slovakia.
13. University of Maribor FERI, Slovenia

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 a 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 estabilished.

Contact person
Assoc. prof. dr.eng. Dan LASCU
Tel: +40 256 403343
E-mail: dan.lascu@etc.upt.ro

6. National Instruments Educational Equipment Grant
Director: Assoc. prof. dr. eng. Dan LASCU
Members: Assoc. prof. dr. eng. Mihaela LASCU
Prof.dr.eng. Viorel POPESCU
Lect. dr. eng. Dan NEGOIȚESCU

FIELD DESCRIPTION

In order to encourage the use of computer-based learning in academic classrooms and instructional laboratories, National Instruments has developed an educational equipment grant program for qualifying institutions.

The following equipment grants was provided: LabVIEW 8.20 Professional, NI Elvis 6070, NI PCI-6070E, SCB-68.

The equipment started to be included and will be used in the Graphical Programming and Power Electronics Laboratories.

4.2 Research Center On Instrumentation, Measurement And Electromagnetic Compatibility (IMCEM)

The research center IMEMC director is:
Prof. dr. eng. Alimpie IGNEA.
Web page: http://www.meo.etc.utt.ro/imcem/
E-mail: alimpie.ignea@ etc.utt.ro.
The Center functions in accordance with certificate CNCSIS, nr. 102/CC-C/11.05.2001.

Research contracts and Grants

1. ***Platform for Study of Physical, Energetical, 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
Total value from MEC: 3 385 000 RON
Total value from "Politehnica": 700 000 RON
Value for the Faculty of Electronics and Telecommunications in 2006: 83,000 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, 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, electrnically connected laboratories around the Solar House, at five faculties: Energetics, Automatics, Electronics, Architecture and Civil Engeneering, 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 energetical 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. Contract 551/2006 ***A new model of a lead acid battery***
Value: 630 Euro (2210,73 lei)
Members of the research group:
Lect. dr.eng. Septimiu MISCHIE, director
Techn. Cornel CRISTA

Beneficiary**:** SIEMENS VDO AUTOMOTIVE S.R.L.

FIELD DESCRIPTION

This project presents a new and improved model of a lead acid battery that takes into account the variations of the received or delivered battery current. The method of parameterizing the model parameters and experimental results are also presented.

ACTIVITIES AND RESULTS

The structure of the proposed model has been obtained following the behavior of a lead acid battery in four different cases, as by experiments was obtained.

This model is a dynamic one, that is it takes into account the variations of the received or delivered battery current. It is valid for time intervals of a few minutes, so the SOC (state of charge) of the battery can be approximated as being constant.

The parameters of the battery model has been determined by measuring the current through the battery and the voltage across the battery during the following sequence: discharge, rest, charge and again rest. For this purpose, an experimental bench was set up. It contains the battery, a resistive load, a power supply, two relays and a resistive shunt, that is used to current through battery measurement. The voltage across the battery and the voltage across the shunt are acquired with a National Instruments PCI 6023 data acquisition board.

The presented model contains elements that take account to different behavior of the battery in charging state, in discharging state or in the rest period.

3. CNCSIS Grant Theme No. 19, Code 173, *Electromagnetic monitoring in Spitalul Clinic Judetean No.1 Timisoara*
Director: Prof.dr.eng. Alimpie IGNEA
Value: 28.000 RON
Members: Prof.dr.eng. Traian JURCA
Prof.dr.eng. Aldo De SABATA
Prof.dr.eng. Mircea CHIVU
Assoc.prof.dr.eng. Mihaela LASCU
Assist.eng. Ciprian DUGHIR
Assist.eng. Adrian MIHAIUTI

Assist.eng. Cora IFTODE
Assist.eng. Liliana STOICA

FIELD AND GRANT DESCRIPTION

Considering the increase of electromagnetic pollution, electromagnetic monitoring becomes very important at locations with a specific destination, especially the ones that include life protection. Spitalul Clinic Judetean nr.1 of Timisoara (Department Hospital) is a high-class unit, with modern equipment, which performs a wide range of surgical interventions. From the point of view of electromagnetic compatibility, the hospital is a large electric power consumer, built in a place with high electromagnetic perturbations (radio and TV emitting antennas, tramway and trolleybus lines, big enterprises around, mobile communication networks, its own electric and electronic equipment, etc). The electromagnetic monitoring in the hospital is recomended because: it allows identification of the quiet zones, the ones with major risk level and the means to reduce that level, the placement of some equipments, etc. Monitoring assumes identification of perturbation sources, followed by measurements of perturbations level. Measurements are done daily, weekly or for a long term, correlated with other events (tramways passing by, lightings, etc). The conducted perturbations will be supervised in the electrical supply network and other networks. The monitoring of radiated perturbations concerns RF emissions, and the hospital's perturbing sources (the existing ISM equipments). Determining the correlation between perturbations, their sources and the transmission means allow for the reduction of their level. The information we get during the monitoring process will be arranged into a map of perturbations distribution according to their characteristics: continuous or intermittent behaviour, level, frequency range, etc. During measurements we will use the telemetry on INTERNET and wireless technology.

ACTIVITIES AND RESULTS

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

4. Contract for realising a postuniversitary lecture: ***Design techniques for the compliance assurance concerning the CEM standards***
Director: Prof.dr.eng. Alimpie IGNEA
Members: Lect..dr.eng. Ioan LIE
Ass. eng. Marius RANGU
Beneficiary: SC NOVAR Honeywell Life Safety, Lugoj
Value: 21.000 RON

FIELD AND GRANT DESCRIPTION

The lecture is postuniversitary level with following task: in 60 hours of lectures and practical activities the design engineers have to familiarize with specific electromagnetic compatibility problems and the use of some modern design techniques for the compliance realisation in correspondence with these standards. In the theoretical part there have been treated the EMC standards, the electromagnetic coupling, the modality of realising the safeguard protection and shielding, EMC design of PCBs and electronic equipments. The practical part is concerning to the design and simulation of PCB using the computer for the compliance assurance with the EMC standards. The lecture finishes with the realisation of an PCB project by each one, choosed in concordance with the beneficiary.

5. PNCDI-INFRAS Program nr. 247 / 2004 ***Interlaboratory tests for uncertainty measurements evaluation in electromagnetic compatibility***
Director: Prof. dr. eng. Alimpie IGNEA
Value: 23,500 RON
Members: Prof. dr. eng. Traian JURCA
Prof. dr. eng. Aldo De SABATA
Assist. eng. Adrian MIHAIUTI
Assist. eng. Cora IFTODE

FIELD DESCRIPTION

- Study concerning the testing methodology on perturbations receivers used for measuring electromagnetic interferences in the electromagnetic compatibility settled domain;
- Elaborating the interlaboratory comparation size scheme in Round Robin system (circular test);
- Design and realization of verifying systems concerning the perturbations receivers and preparing the testing procedures;
- Design and realization of unit source for mobile perturbations;
- Interlaboratory attempts with perturbations receivers for each partner;
- Processing and evaluation of interlaboratory measurements results.

ACTIVITIES AND RESULTS

In the first phase was made a study concerning the electromagnetic perturbations sources used in CEM which is part of the research report concerning all the participants to the INFRAS contract .

In the second phase there have been realised 6 exemplars of a comb generator that have been distributed to the contract participants. One of the generators has been used using the method "round robin" for testing the measuring receivers belonging to the contract participants.

WORK-SHOP CO- ORGANISATION

a) Workshop: ***Where are we running from***, organised in Bucureşti inside the CERF exposition 2006, date 5 May 2006, with the participation of following paper: Prof.Dr.Eng. Alimpie Ignea, *ELECTROMAGNETIC FIELD INTERACTION –LIVING ORGANISM*

b) Workshop: ***Romanian Regulations Harmonised with the European Directives*** Bucharest on 22 June 2006
Investigated domains: Low Voltage, Electromagnetic Compatibility, Radio Equipments and Telecommunications
Paper presented:
Prof.Dr.Eng. Alimpie Ignea, *MEASUREMENT SPACES/EMC TESTING*

c) Workshop: ***Harmonised Roumanian Regulations with the European Directives***
Investigated domains: Voltage, Electromagnetic Compatibility, Radio Equipments and Telecommunications, Craiova December 22 2006, Paper presented:
Prof. Dr. Eng. Alimpie Ignea, *ANTENNAS CALIBRATION.*

6. CNCSIS grant No. 2, CODE 340, type A,
Title: Dynamic Characterization and Modelling of the Analog-to-Digital Converters Used in High-Speed Data Communications
Director: - Assoc. Prof. Dr. Eng. Daniel BELEGA
Value: - 7200 RON
Members: - Assist. Eng. Dughir CIPRIAN
- Assist. Eng. Dragoi BENIAMIN

FIELD AND GRANT DESCRIPTION

- Presentation of a new method for dynamic testing of analog-to-digital converters by ramp testing signals.
- Development of a test system for analog-to-digital converters (ADCs) in which the ADC dynamic parameters are estimated by the proposed method.
- Determination of a constraint for the normalized frequency used in the three-parameter sine-fit algorithm for estimating with high accuracy of the dynamic parameters of an ADC by means of this algorithm.
- Determination of the theoretical expressions for calculating the parameters of a multifrequency signal by means of the interpolated discrete Fourier transform (DFT) method with a *H*-term maximum sidelobe decay windows ($H \geq 2$).

7. CNCSIS grant No. 58GR/19.05.2006, Theme No. 9, Code CNCSIS 369, *Modern Techniques for Biomedical Signal Processing and Hypermedia Transmitting*

Director: Assoc. prof. dr. eng. Mihaela LASCU
Value: 10000 RON
Members: Prof. dr. eng. Alimpie IGNEA
Prof. dr. eng. Traian JURCA
Prof. dr. eng. Aldo DE SABATA
Assist. eng. Liliana STOICA
Assist. eng. Gabriel GĂŞPĂRESC
Assist.eng. Cora IFTODE
Assist.eng. Adrian MIHAIUTI
Master student Adrian Val HAREA
Master student Marius Ady MIKLOS

FIELD AND GRANT DESCRIPTION

The purpose of the present project is biosignal acquisition, processing and modeling as well as presenting different analysis techniques and implementing the most effective methods for information storage, sorting and display. The clinically relevant information in the signal is often hidden by noise and interference, and the signal features may not be readily comprehensible by the visual or auditory systems of a human observer. In most of the cases biomedical signal processing requires a filtering operation for noise and power-line interference removal; spectral analysis is performed to understand the frequency characteristics of the signals and while modeling is necessary for feature representation and parameterization. Computer analysis of biomedical signals has the potential to add objective strength to the interpretation of the expert. Thus it becomes possible to improve the diagnostic confidence or accuracy

even for an expert with many years of experience. This approach to improved health care could be labeled as computer-aided diagnosis. The main task is biomedical signal acquisition, data base realisation and the development of algorithms for biomedical signal analysis. It is intended to setup comparative performance study regarding the different implemented methods that lead to a correct diagnosis. The project will contribute to high quality human resources (PhD's, graduating students, postgraduate students).

ACTIVITIES AND RESULTS

The research results will be disseminated by publishing books, papers and by direct contact with the interested hospitals. The main purpose is to have in future an illness diagnosis with a greater accuracy.
The project is fitting the strategy plan of Politehnica University Timisoara. The research activities will take place in the Electromagnetic Compatibility Laboratory, which is equipped with high performance measurement, acquisition and processing systems, as a result of different research projects.

8. COST 289 Spectrum and Power Eficient Broadband Communications
Prof. dr. eng.Aldo De SABATA is delegate 2 for Romania, representative of the "Politehnica" University of Timişoara: http://cost289.ee.hacettepe.edu.tr/

4.3 Communications Department Research Activity

Research and Educational Projects, Contracts and Grants

1. CNCSIS grant No. A1/GR181/19.05.06, CODE 637, type A,
Title Digital receivers performance increasing using wavelets theory
Director:Prof. dr .eng. Alexandru ISAR
Value: 16000 RON
Members:
Prof. dr. eng. Miranda NAFORNITA
Prof. dr. eng. Andrei CAMPEANU
Assoc. Prof. dr. eng. Dorina ISAR
Lect. Dr. eng. Cornel BALINT
Assist. Eng. Horia BALTA
Asist eng. Radu LUCACIU
Assist eng. Andy VESA
Assist. eng. Corina NAFORNITA
Techn. Virgil POPOVICI

FIELD AND GRANT DESCRIPTION

Every communication system is composed of an emission unit and a receiver. These two parts are connected through a communication channel. The information content of the signal at the output of the emission unit is affected by the channel noise. The complexity of the coder from the emission unit and of the decoder from the receiver, is selected in accordance with the channel noise charactersitics. For more difficult channels, more complex and expensive coding-decoding systems must be used. If the communication channel is more difficult than expected then this detection system produces some errors. This is the reason why communication systems must be classified using the Bit Error Rate, BER, a decreasing function of the Signal to Noise Ratio, SNR, of the communication channel. The optimization of this function can be performed optimizing the channel coding-decoding systems, very modern solution, where the best results are obtained using turbocodes, or by the enhancement of the SNR at the input of the detection unit from the receiver. The present research takes into account this second strategy, and uses the properties of the wavelet functions. We propose the inclusion of a denosing system in the structure of a protopype receiver between the digital to analog convertor output and the input of the decoder, working in three steps: the computation of the discrete wavelet transform of the input signal, the nonlinear filtering of the result and the computation of the inverse discret wavelet transform of the new result. When all the other bloks of the prototype receiver are not modified, the BER(SNR) characteristic of the new receiver is better than the BER(SNR) characteristic of the proptotype receiver. If the realization of the same BER(SNR) characteristic for the two receiverrs is requiered then the structure of the channel coding-decoding system can be simplified.

ACTIVITIES AND RESULTS

The coding techniques study was continued this year and the solution based on turbocodes was selected for our digital receiver. Different aspects regarding this solution were published by some of the members of our research team, coordinated by Prof. Dr. Eng. Miranda Nafornita, who collaborated with some well known researchers from abroad.

Another direction of our research, developed this year, was the study of digital detectors and of the wavelet modulation systems. The interfaces between these systems were also studied.

We have found that the best detectors are the soft ones. A solution based on neural networks was selected. It is described in few dissertations directed by some of the members of our research team.

We have made some simulations for the case of additive noise channels. The signal from the input of the detector is obtained at the output of a demodulation system. Because more and more recent studies recommend the wavelet modulation we started to investigate this kind of modulation. A wavelet modulation system consists in an Inverse Discrete Wavelet Transform (IDWT) computation block for the emission and in a Discrete Wavelet Transform (DWT) computation block for the receiver. In fact, a generalization of the Orthogonal Frequency Division Multiplexing, (OFDM), principle is obtained. This modulation type represents the subject of another PhD Thesis, directed by professor Miranda Nafornita. We have simulated a wavelet modulation system based on the DWT. The members of our research team frequently use this transform. Another example of its application is in the field of watermarking a telecommunication security technique. Another member of our research team, Corina Nafornita, explores this field, in the framework of her PhD Thesis. In her latest articles, she presented a very advanced watermark insertion in the DWT domain technique. The results obtained simulating the wavelet modulation were included in few dissertations directed by some of the members of our research team. The use of this type of modulation makes possible a redundant transmission facilitating the optimization of digital detectors. Now, we explore some new digital detectors that combine the advantages of denoising systems with the advantage of this extra redundancy. In the future we intend to study the efficiency of a wavelet modulation implemented with the aid of other wavelet transforms, exploited or invented in our research team: the double tree complex wavelet transform, DTCWT, the wavelet packets transform, WPT, and the Quaternionique wavelet transform, QWT.

2. CNCSIS grant No. –GR.226/14.09.2006 , CODE - 342, type - A,
Title Neural Networks Based System For The Diagnosis And Prognosis Of Urological Deseases
Director: - Assoc. prof. dr. eng. Corina Botoca
Value: - 30500
Members:
Prof. dr. eng. Vasile GUI
Assoc. prof. dr. eng.Budura GEORGETA,
Assoc. prof. dr. eng. Florin ALEXA
Assoc. prof. MD. Viorel BUCURAS
Assoc. prof. MD. Alice DEMA
Lecturer MD. Mircea BOTOCA
Asist eng. Nicolae MICLAU
Ass. MD. Alin CUMPANAS
Ass. MD. Razvan Bardan
MD. Razvan DRAGOI
Reseacher Iulia CHINDE
Reseacher Monica MOROVAN

FIELD AND GRANT DESCRIPTION

Thematic area: Advanced informatics systems and models for the assistance of medical diagnosis and preventive medicine. The diagnosis and prognosis of a patient are usually realized by processing clinical information. When the volume and the variety of the information become too demanding for the clinician, the need for supportive statistical prediction methods emerges. When the classical methods, like statistical modeling, are failing, due to computational complexity and to long processing times, the artificial neural networks (ANN) could offer effective solutions, being able to perform real-time prediction of the diagnosis and prognosis of a disease. Our project aims to develop and validate a neural integrated system, in an adequate programming medium, capable to offer urological problems solutions. The proposed system will contain a package of complex analyses and evaluation programs, similar with the evaluation-decision model from the clinical medicine. The system inputs will be variables carefully selected, with different weights, obtained from the real situations and anytime comparable with the real, functional, clinical model. In order to collect the clinical data necessary to develop a diagnosis and prognosis system for urology clinical trials will be completed, on patients with prostate cancer, bladder cancer, kidney cancer, benign prostatic hyperplasia and urinary lithiasis. Models of clinical urological applications will be developed using various ANN architectures, multilayers perceptrons, radial basis function and competitive ANN. The comparison of the performance of different ANN architectures and training algorithm will be accomplished and the model with the best accuracy/complexity ratio will be selected, in order to integrate it into a unitary diagnosis system. During the last year of the project the functionality of the implemented system will be analyzed and clinical diagnosis algorithms, using the predictions offered by the ANN will be elaborated. The experience acquired by the team will be shared with other interested research teams, forming a national research community in the field of NN applications in medicine.

ACTIVITIES AND RESULTS

A number of clinical trials protocols on patients with prostate cancer, bladder cancer, kidney cancer benign prostatic hyperplasia and urinary lithiasis have been developed, in order to collect the clinical data. The materials bases necessary for the system implementation was bought. The chemical materials necessary for the clinical trials have been aquired. Several portable systems and software programs for neural networks simulation have been studied and the most adequate package hard-software has been acquired. Scientific contacts with researches having the same preoccupations have been established in Prague, Czech Republic, in Wien, Austria and Nijmegen, Holland. A web site dedicated to the project research theme is under construction. The research results

have been fructified through participation to national and international congresses and conferences, through publishing in specialized journals, totalizing a number of 11 published papers.

3. CNCSIS grant no. 2930/2006, code 47, type TD, theme no. 9
Title Digital watermarking of images in the transform domain, phase "Image Watermarking Attacks Analysis"
Director: Assist eng. Corina NAFORNITA
Value (RON): 5500
Members: Corina NAFORNITA

FIELD AND GRANT DESCRIPTION

In the Internet communication era, the piracy of the multimedia products can be fought through watermarking. The watermark should carry valuable information about the owner and the original image. Watermarking for authentication of intellectual property should allow: marking the original image; extraction of the mark from the received image; comparison between the two marks. Current techniques for image watermarking are spatial domain or frequency domain methods. The second one is used frequently and is more versatile. A topic research subject in this matter is finding the best transform, invariant to usual operations (translation, rotation, scaling etc).

ACTIVITIES AND RESULTS

Research has been done to understand the present watermarking techniques and their applications. A research report has been published on the web page of the Communications Dept., which investigates the problem of fragile / semi-fragile watermarking. Two papers dealing with perceptual watermarking have been published at international conferences abroad and in Romania. Another paper proposes a new wavelet transform that might be used for watermarking.

4. CEEX Project, Contract Nr. CEX 60 / 28.07.2006, *Control and Monitoring from the Distance System for Intelligent Buildings „COMODICI"*, period 2006-2008, UPT partner
Director: Prof.dr.eng. Radu VASIU
Value 2006: 22,000 RON
Members: Prof.dr.eng. Radu VASIU
Lect.dr.eng. Mugur MOCOFAN
Assist.eng. Marian BUCOS
Assist.eng. Mihai ONITA

Partners: Technical University of Cluj-Napoca
"Transilvania" University of Brasov
Siemens PSE Brasov

FIELD AND GRANT DESCRIPTION

Intelligent buildings apply technologies to improve the building environment and functionality for occupants/tenants while controlling costs. Improving end user security, comfort and accessibility all help user productivity and comfort levels. The owner/operator wants to provide this functionality while reducing individual costs. Technologies make this possible. An effective energy management system, for example, provides lowest cost energy, avoids waste of energy by managing occupied space, and makes efficient use of staff through centralized control and integrating information from different sources. An efficient integrated system enables a modern, comprehensive access and security system to operate effectively and exchange information with other building systems. Fully integrated functionality includes the ability to open doors, notify responsible staff of unwanted intrusions and ensure that lighting, fire and other building management systems are informed of staff that arrive or depart the building. This information can then be used to manage the local environment and the resulting energy usage. Life safety systems, notably fire systems, are heavily regulated by stringent code requirements. These requirements do not, however, prevent the information from a fire system being provided to other systems. This opportunity can be exploited to open doors and illuminate a building when fire alarms are received. Transducers (detectors) can measure many building parameters, e.g., vibration, strain and moisture, to continually monitor the building's infrastructure condition. To integrate these systems and exchange information effectively, a ubiquitous and reliable communications infrastructure is needed. These systems are typically managed by personal computers (PCs) using data processing communication techniques and both wired and wireless communication technologies. The key communications issues are redundancy, resilience, security and the assurance for all users that "their data" is secure. Integration considerations may be addressed through standards and conventions, or manufacturers' protocols. Since proprietary solutions permeate the industry, total interworking is currently unattainable, but the future will require full interoperability, with information exchanged among all systems, hence we will need technologies that translate

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

Director: Assoc.prof.dr.eng. Marian MOCAN
Value 2006: 130,000 RON
Members: Prof.dr.eng. Radu VASIU
Prof.dr.eng. Marius OTESTEANU

Prof.dr.eng. Aldo DE SABATA
Assoc.lect.eng. Diana ANDONE
Lect.dr.eng. Mugur MOCOFAN
Assist.eng. Marian BUCOS
Assist.eng. Mihai ONITA
Eng. Marius CONDREA
Eng. Iasmina ERMALAI

Partners: I.N.C.S.M.P.S. Bucharest
I.P.A. SA Bucharest
CURS SA Bucharest
INOE Bucharest

FIELD AND GRANT DESCRIPTION

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

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

The project objectives are:

- to make an analysis of the strong points, of the weak points, of the effective and potential opportunities, of the effective and potential factors of risk resulting from the economical evolution on long term, medium term and short term
- to develop a strategy and a potential national plan for R & D
- to make proposals able to create the framework and the instruments needed for valorising the existing opportunities, for translating some potential opportunities into effective ones, for minimizing the existing risks and for preventing the identified potential risks
- to elaborate the main scenarios for the Romanian economical and social development until 2020, as a premise for the elaboration of a consolidated foresight endeavour, made up from „critical domains / technologies"
- to elaborate the National Plan for research – development – innovation, that will include the means and ways to encourage and support the critical domains / technologies, the modalities for their effective implementation, the monitoring and evaluation tools, the financing mechanisms and resource allocation principles, the modalities to promote excelency.

Project details can be found at:
www.cm.upt.ro/inofvor

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

Director: Assoc.prof.dr.eng. Marian MOCAN
Value 2006: 195,000 RON
Members: Prof.dr.eng. Radu VASIU
Assoc.lect.eng. Diana ANDONE
Lect.dr.eng. Mugur MOCOFAN
Assist.eng. Marian BUCOS
Assist.eng. Mihai ONITA
Eng. Marius CONDREA
Eng. Iasmina ERMALAI
Coordinator: I.N.C.S.M.P.S. Bucharest
Partners: I.P.A. SA Bucharest
CURS SA Bucharest
INOE Bucharest

FIELD AND GRANT DESCRIPTION

The Lisbon Agenda (2000) establishes as the main strategical objectiv that „the EU should become the most competitive and dynamic knowledge based economy in the world, capable of sustainable economical growth, with more and better work places and

with a bigger social cohesion". The project represents an effective contribution to the implementation of those desires.

The project objectives are:

- Realization of a report about the existing situation at international level, including in the EU, reffering to the concept of social cohesion
- Design of informatic instruments for documentation, communication, collaboration and implementation of some activities
- Elaboration of some empirical analyses regarding the existing situation in Romania, including the external dimension (Corporate Social Responsability – CSR)
- Elaboration of a methodology for the investigation of the internal dimension of IRS/CSR in Romania
- Elaboration of a methodology for the investigation of the dimension of IRS/CSR at the level of organisation in Romania
- Evaluation of the dimension of the economical, social and environmental aspects, at the elvel of organisation, in Romania
- Evaluation of the impact of IRS/CSR towards the competitivity, occupational quality, inclusion and social cohesion
- Determination of some directions of perspective in applying IRS/CSR in Romania, in European context.

Project details can be found at:
www.cm.upt.ro/rse&ue

7. CNCSIS grant No. 2738/19.05.06, A1/GR181/19.05.06 CODE 600 , type A,
Title Object tracking estimation in video sequences
Director: Assoc. prof. dr. eng. Florin ALEXA
Value (RON): 16000
Members:

Prof. dr. eng. Corneliu I TOMA
Prof. dr. eng Vasile GUI
Lect. dr. eng. Muguras MOCOFAN
Lect. dr. eng. Catalin CALEANU
Assist. eng. Andy VESA
Assist. eng. Ciprian DAVID
Assist. eng. Artur MULLER
Eng.Codrut IANASI
PhD student Andreea GALEANU
stud. Daniela CLIM

FIELD AND GRANT DESCRIPTION

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

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

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

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

International Contracts and Grants

8. ***Development of Software Defined Radio Platform: Optimal usage of radio resources and multiple air interface terminals***
Director: Philip CONSTANTINOU, Ioan NAFORNITA
Partners: National technical University of Athens, Greece, UPT, Timisoara, Romania
Beneficiary: Ministry of Development Greece, INTRACOM SA, Greece

9. GRANT TYPE: Brancusi,
TITLE: ***Débruitage des images SONAR en utilisant la théorie des ondelettes: applications aux systèmes d'aide à la decision pour la classification***
Director: Assoc. prof. dr. eng. Sorin MOGA, from ENST-Bretagne
Value: 3780 Euros
Partners : France and Romania
Members : ENST de Bretagne, Brest, France and UPT

Research team :
France: Assoc. Prof. Sorin Moga,
Prof. Jean-Marc Boucher,
Assoc. Prof. Dominique Pastor.
Romania: Prof. Ioan Nafornita,
Prof. Alexandru Isar,
Assoc. Prof. Dorina Isar,
Assoc. Prof. Corina Botoca.

FIELD AND GRANT DESCRIPTION

This is the second phase of a France-Romania bilateral research programme, called Brancusi, during two years. It facilitates the activity of an international research team, encouraging the mobility between the two countries. The city of Brest, where ENST-B is located, was declared a pole of excellence in oceanographic research. This is the reason why we selected a research field dealing with the ocean exploration.

ACTIVITIES AND RESULTS

In the first phase of this grant, last year, the three members of the French research team visited our faculty. They have presented their results in a series of conferences organized in the framework of our French master. Sorin Moga presented the theory of neural networks, Jean-Marc Boucher presented some classification strategies with application in the treatment of SONAR images and Dominique Pastor presented some new results in the statistical signal processing.
Three members of the Romanian research team visited, last year, ENST-B. Professor Nafornita sustained a conference about the basics of the statistical signal processing, Corina Botoca presented some new results in the field of neural networks theory and Alexandru Isar visited the section of IFREMER located in Brest.
This year this mobility will continue. Sorin Moga already visited our faculty and presented to our students his university and some mobility programs dedicated to students by the European Union. Two other French professors will visit our faculty. Three Romanian Professors will visit ENST-B also.
We have already published in common more than ten articles.

10. Research Contract 404 / 2006 with Siemens VDO Automotive, Germany:

Rain Simulator Design for Study of Environmental Parameters' Influence on Sensors Used in Automotive Industry
Director:

- prof. dr. eng. Marius OTEŞTEANU
Value: 29.000 Euro
Members:
Prof. dr. eng. Aurel GONTEAN
Prof. dr. eng. Vasile GUI
Eng. Ştefan DUNĂ
PhD student Sandra RUGINĂ
PhD student Georgina SARBU-DOAGĂ
Eng. Constantin ALECSA
Techn. Cornel CRISTA

ACTIVITIES AND RESULTS

The research studied the influence of various parameters for some sensors used in automotive industries. The theoretical work included phenomenon modelling and data analysis; practical experiments conducted in different environmental conditions established sensors the behaviour. Comparisons between modelled situation and real world measurement were also performed. The results included a simulator, automation and a database software, data logging and graphs, extensive conclusions.

11. CEEPUS GRANT CII-HU-0008-01-0607 *Telecommunication*
Director:
Prof. dr. eng. Marius OTEŞTEANU
Partners :
- Czech Technical University in Prague, Czech Republic
- University of Zagreb, Croatia
- Budapest Polytechnic, Hungary
- University of Maribor, Slovenia
- Slovak University of Technology in Bratislava, Slovakia
Members :
Prof. dr. eng. Vasile GUI
Assoc. prof. dr. eng. Florin ALEXA
PhD student Daniel POPA
PhD student Sandra RUGINA
student Iulia BUBLEA
student Liliana PÎRVA

12. Socrates Erasmus Curriculum Development project: *International On-Line Master in Multimedia (IMM – CD)*
Director: Prof.dr.eng. Radu VASIU

Value: 40,600 EURO
Members: Prof.dr.eng. Nicolae ROBU
Assoc.lect.eng. Diana ANDONE
Lect.dr.eng. Mugur MOCOFAN
Assoc.lect.eng. Daniel HAIDUC
Assist.eng. Marian BUCOS
Assist.eng. Mihai ONITA
Eng. Marius CONDREA
Iasmina ERMALAI, PhD student
Partners: Univ. of Nice, FR
JME Associates, UK
Univ. of Technology, Kaunas, LT
E-Collegium, Budapest, HU
Univ. of Godollo, HU
Mimoza Kft, Budapest, HU
Univ. of Zvolen, SK

FIELD DESCRIPTION

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

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

"Politehnica" University of Timisoara is the program coordinator and contractor.

Further details on the project can be found at:
www.immaster.net

13. Leonardo da Vinci II project: *Measure to Improve (METOIM)*
Director: Prof.dr.eng. Radu VASIU
Value: 51,476 EURO
Members: Assoc.lect.eng. Diana ANDONE
Assoc.lect.eng. Daniel HAIDUC

Assist.eng. Marian BUCOS
Assist.eng. Mihai ONITA
Eng. Marius CONDREA
Lucia RAZMERITA, journalist
Cristian TECU, PhD student

Partners: IAL Toscana, IT
BFI Steiermark Graz, AT
M2A Technologies, FR
Macedonian Institute of Employment (MAKINE), GR
OFA Kht., HU

FIELD DESCRIPTION

The project's main objectives are:

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

Further details on the project can be found at: www.metoim.org

14. Leonardo da Vinci II project: *e2Engineering*

Director: Prof.dr.eng. Radu VASIU
Value: 23,153 EURO
Members Assoc.lect.eng. Diana ANDONE
Assist.eng. Marian BUCOS
Assist.eng. Mihai ONITA
Prof.dr.eng. Doina DRAGULESCU
Prof.dr.eng. Mirela TOTH-TASCAU
Eng. Iasmina ERMALAI, PhD student

Eng. Cristian TECU, PhD student
Eng. Marius CONDREA
Lucia RAZMERITA, journalist
Partners: Univ. Godollo, HU
Univ. Miskolz, HU
EADTU – European Association of Distance Teaching Universities, NL
Univ. of Gdansk, PL
Univ. of Kosice, SK
Ethos Associates, UK

FIELD DESCRIPTION

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

15. Leonardo da Vinci II project: *E-REPORT. Transnational virtual study circles: e-learning supports for tutorship and learning groups*

Director: Prof.dr.eng. Radu VASIU
Value: 75,000 EURO
Members Assoc.lect.eng. Diana ANDONE
Assist.eng. Marian BUCOS
Assist.eng. Mihai ONITA
Lect.dr.eng. Matei TAMASILA
Eng. Iasmina ERMALAI, PhD student
Eng. Cristian TECU, PhD student
Eng. Andrei TERNAUCIUC, PhD student
Eng. Marius CONDREA
Lucia RAZMERITA, journalist
Partners: Università degli Studi di Palermo, IT
University of Salzburg, AT
Confederación Empresarial de la Provincia de Alicante – COEPA, ES
Gotland University, Gotland, SE
Karolinska Institute, Stockholm, SE

FIELD DESCRIPTION

E-REPORT project will contribute to set up a communitarian repertory of reference material with regard to the development of innovative methods and best practices in the field of e-learning system for VET (universities and vocational institutes). Particularly,

the project is aimed at setting up the basis for the constitution of a transnational virtual study circle.
This demands a comprehensive and transnational approach that implies:

- analyses of the educational and training needs in the field of e-learning;
- international comparison of the quality and the quantity of the existing online courses provided by both universities and vocational institutes;
- international comparison between contents, methods and services adopted in this field in order to standardize them;
- the elaboration of a shared repertory of contents, methodologies, services and training tools;
- the testing and validation of this repertory to a significant sample of the final users of the project's output;
- the promotion of processes of virtual mobility among european students and teachers/trainers;
- the transnational communication and exchange between universities and vocational centres, public and private;
- the ongoing valorisation and dissemination of the results during the project, involving the final users of the outputs

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

Director:	Assoc.lect.eng. Diana ANDONE
Value:	61,314 EURO
Members	Prof.dr.eng. Radu VASIU
	Lect.dr.eng. Mugur MOCOFAN
	Assoc.lect.eng. Daniel HAIDUC
	Assist.eng. Marian BUCOS
	Assist.eng. Mihai ONITA
	Eng. Marius CONDREA
	Lucia RAZMERITA, journalist
	Cristian TECU, PhD student
	Iasmina ERMALAI, PhD student
Partners:	Univ. Miskolcz, HU
	E-Collegium, Budapest, HU
	Univ. of Godollo, HU
	Mimoza Kft, Budapest, HU
	EADTU – European Association of Distance Teaching Universities, NL
	Univ. of East London, UK
	Univ. of Gdansk, PL
	Univ. of Kosice, SK
	Univ. of Plovdiv, BL

FIELD DESCRIPTION

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

5. Publications

5.1 Papers

1. Alexa, F., Gui, V., ***"****Planar Motion Estimation for very low Bit Rate Image Transmission*", WSEAS Transaction on Signal Processing, Issue 1, Volume 2, January 2006, pp.45-51, ISSN 1790-5022

2. Andone, D., Vasiu, R., Bucos, M., *The Implementation of an International Master in Multimedia – a model for a Europe Wide Degree*, Proceedings of the International Conference "Networking Entities" NETTIES 2006, Timisoara, Romania, 6-9 September, 2006, ISBN 973-638-262-1, pp. 112-117

3. Andone, D., Vasiu, R., Bucos, M., *Evaluation of the METOIM Web-Tool – Testing Competences Online*, Proceedings of the International Conference "Networking Entities" NETTIES 2006, Timisoara, Romania, 6-9 September, 2006, ISBN 973-638-262-1, pp. 139-144

4. Andone, D., Vasiu, R., Onita, M., Ermalai, I., *Testing the E-Tasters*, Proceedings of the International Conference "Networking Entities" NETTIES 2006, Timisoara, Romania, 6-9 September, 2006, ISBN 973-638-262-1, pp. 145-150

5. Andone, D., Vasiu, R., Onita, M., Ermalai, I., *E-Tasters–New Developments on E-Learning for Lifelong Learning*, in *E-Competences for Life, Employment and Innovation*, Editors: Andras Szucs, Ingeborg Bo, Published in Vienna, Austria by EDEN (European Distance and E-Learning Network), June 2006, ISBN 963 06 0063 3, pp. 393-398

6. Băbăiță M.**,** Popescu V., Popovici A., Papazian P., *Modeling, Analysis and Simulation Results Regarding a Power Factor Correction Rectifier*, Scientific Bulletin of the „Politehnica" University of Timişoara, Transactions on Electronics and Telecommunications, "ETc. 2006", Tom 51 (65), fasc. 1, 2006, ISSN 1583-3380, pp. 136-141.

7. Băbăiță, M., Popescu, V., Popovici, A., *A new technique for PFC rectifiers design,* Analele Universitatii din Oradea, Fasc. Electrot. Sect. Electronica, 2006, pp. 21-25.

8. Băbăiță, M.**,** Popescu, V., Popovici, A., Lascu, D., Negoițescu, D., *New Power Factor Correction Rectifiers with Fast Response*, WSEAS TRANSACTIONS on SYSTEMS, Issue 4, Volume 5, April 2006, ISSN: 1109-2777, pp. 727-734.

9. Băbăiță, M., Popescu, V., Popovici, A., *Modeling, analysis and simulation results regarding a PFC rectifier,* Scientific Bulletin of the „Politehnica" University of Timişoara, Transactions on Electronics and Telecommunications, Tom 51 , Fasc., 2006, pp. 136-142.

10. Belega, D., Dallet, D., *Dynamic Characterization of A/D Converters by Ramp Testing Signals*, XVIII IMEKO World Congress, 11th Workshop on ADC Modelling and Testing, September, 17-22, 2006, Rio de Janeiro, Brazil.

11. Botoca, C., Budura, G., Miclău, N., *Competitive Learning Algorithms for Data Clustering,* Facta Universitatis Nis, Vol.19, Issue no.2, August, 2006, ISSN 0353-3670, 2006, pp. 261-269

12. Botoca, C., Budura, G., *Neural Symbol Decision Equalizer using Competitive Learning,* WSEAS Transactions On Circuits And Systems**,** Issue 6, Volume 5, June, 2006, ISSN 1109-2734, pp. 829-836

13. Botoca, C., Budura, G., *Symbol decision equalizer using a radial basis function neural network,* Proceedings The 7th WSEAS International Conference on NEURAL NETWORKS (NN'06) Cavtat, Croatia, June 12-14, 2006

14. Botoca, C., Budura, G., *Complex data clustering using a new competitive learning algorithm*, Proceedings, Applied Electronics, Pilsen, 6-7 sept. 2006, pp.23-26, ISSN 0353-3670.

15. Budura,G., Botoca, C., *Efficient Implementation of the Third Order RLS Adaptive Volterra Filter*, Facta Universitatis (Nis), Ser.: Elec.Energ. vol.19,no.1, April 2006, pp.1-9, ISSN 0353-3670.

16. Budura,G., Botoca, C., *Some practical considerations regarding the identification of a nonlinear system*, Revue Roumaine De Sciences Techniques, Serie Electrotechnique et Energetique, Tome 51, 1, 2006, Pag.79-90, ISSN-0035-4066.

17. Budura,G., Botoca, C., *Modeling and Identification of Nonlinear Systems Using the LMS Volterra Filter*, Wseas Transactions On Signal Processing No.2, February, 2006, Pag.190-197, ISSN 1790-5022.

18. Căleanu, C. D., Gui, V., Alexa, F., *Direct Search Optimized Feature Extraction, WSEAS Transactions on Systems and Control,* 2006 – accepted paper, to appear in dec. 2006.

19. Căleanu, C.D., Botoca, C., *C# Solutions for a Face Detection and Recognition System*, Facta Universitatis, Ser. Elec. Energ., Nis, Yugoslavia, 2006.

20. Căleanu, C.D., Gui, V., Alexa, F., *Face Recognition via Direct Search Optimized Gabor Filters*, The 5th WSEAS International Conference on System Science and Simulation in Engineering, (ICOSSE'06) Tenerife, Canary Islands, Spain, December 16-18, 2006 - accepted paper, to appear in dec. 2006.

21. Câmpeanu A., Gal, J., *OTA-C Biquad Cells Emulation Of LC Ladder Filters*, Scientific Bulletin of the Politehnica University of Timisoara, Transactions on Electronics and Communications, Tom. 51(65), Fasc. 1, pp. 154-157 ISSN 1583-3380.

22. De Sabata, A., Ignea, A., *Sampling expansions on lattices for multidimensional, multiband signals*, WSEAS Transactions on Signal Processing, Issue 1, Vol. 2, Jan. 2006, pp. 60-66, ISSN 1790-5022.

23. Matekovits, L., De Sabata, A., Pirinoli, P., Orefice, M., *Broadband measurement of the refractive index using microstrip lines*, Bul. St. Univ. "Politehnica" din Timisoara, Trans. on Electronics and Telecomm., Tom 51(65), Fasc. 1, 2006, pp. 44-48, ISSN 1583-3380.

24. Dughir, C., Găşpăresc, G., *Preconditioning Circuit for Electrical Power System Disturbances Measurement,* Buletinul Stiintific al Universitatii "Politehnica" din Timisoara, septembrie 2006, Timisoara, Tom 51(65), Fascicola 1, 2006, ISSN 1583-3380, "Etc2006", p. 164-169.

25. Dughir, C., Găşpăresc, G., Stoica, L., *Remote Surveillance System Using Smartcat BL2100 Single Board Computer*, Lucrările ştiinţifice ale simpozionului internaţional multidisciplinar "Universitaria Simpro" 2006, Editura Universitas, Petroşani, 13-14 octombrie 2006, ISSN 1842-4449, p. 114-117.

26. Dughir, C., Găşpăresc, G., *Three Channels Analysis System for Electrical Power System Disturbances Measurement*, Buletinul Institutului Politehnic Iaşi, Tomul LII (LVI), Fasc. 5, 2006.

27. Fuiorea D., Pescaru D. Al., Gui V., Toma C. I., *Feature Based 2D Image Registration Using Mean Shift Parameter Estimation*, Scientific Bulletin of the "Politehnica" University, Timişoara, Transactions on Electronics and Telecommunication Tom 51(65), Fasc. 2, 2006, pp. 77-80, ISSN 1583-3380.

28. Pescaru D. Al., Fuiorea D., Gui V., Toma C. I., Muntean G. M., Doboli A., *Image-based Node Localization Algorithm for Wireless Video Sensor Networks*, The Sixth Information Technology and Telecommunication Conference IT&T'06, Carlow, Ireland, October 25, 2006.

29. Gacsádi A., Grava, C., Tiponuţ, V., Szolgay, P., *A Differential Motion Estimation Method using Cellular Neural Networks*, Proceedings of the International Conference on Renewable Sources and Environmental Electro-Technologies (RSEE'2006), ISSN 1454-9239, pp. 34-38, Oradea, Romania, 2006.

30. Gacsádi, A., Grava, C., Tiponuț V., Szolgay, P., *A CNN Implementation of the Horn & Schunck Motion Estimation Method*, Proceedings of the IEEE International Workshop on Cellular Neural Networks and their Applications (CNNA 2006), pp. 120-124, Istanbul Turkey, 2006.

31. Gacsádi, A., Tiponuț V., Szolgay, P., *Image-Based Visual Servo Control of a Robotic Arm by Using Cellular Neural Networks,* Proceedings of the 15th International Workshop on Robotics in Alpe-Adria-Danube Region, (RAAD 2006), ISBN: 9637154 48 5, pp.123-128, Balatonfüred, Hungary, 2006.

32. Gal, J., Câmpeanu, A., Naforniță, I., *Estimation Of Noisy Sinusoids Instantaneous Frequency By Kalman Filtering*, Scientific Bulletin of the Politehnica University of Timisoara, Transactions on Electronics and Communications,Tom 51(65) , Fasc. 2, pp. 69-72, ISSN 1583-3380.

33. Gavriluț, I., Gacsádi, A., Grava, C., Tiponuț, V., *Vision based algorithm for path planning of a mobile robot by using cellular neural networks*, Proceedings of the IEEE International Conference on Automation, Quality&Testing, Robotics (AQTR 2006) ISBN 1-4244-0360-X, pp. 306-311, Cluj-Napoca, Romania 2006.

34. Gavriluț, I., Tiponut, V., Neamtu, O., Țepelea, L., Gacsádi, A., - *Path Planning Methods for Mobile Robot by Using Cellular Neural Networks* - Proceedings of the International Conference on Renewable Sources and Environmental Electro-Technologies (RSEE'2006), ISSN 1454-9239, pp. 39-42, Oradea, Romania, 2006.

35. Gavriluț, I., V. Tiponuț, V., Gacsádi, A., *Path Planning of Mobile Robots by Using Cellular Neural Networks,* Proceedings of the IEEE International Workshop on Cellular Neural Networks and their Applications (CNNA 2006), pp. 234-239, Istanbul, Turkey, 2006.

36. Ianăşi, C., Gui, V., Alexa, F., Toma, C. I., „*Noncausal, Adaptive Mode-Tracking Estimation for Background Substraction in Video Surveillance*", WSEAS Transaction on Signal Processing, Issue 1, Volume 2, January 2006, pp.52-59, ISSN 1790-5022.

37. Gontean, A., Otesteanu, M., Rugina, S., Sarbu-Doaga, G.,. Sârbu-Doagă, G., *Versatile Communication Solution for PLC Based Control Systems*, WSEAS Transactions on Communications, Issue 12, Volume 5, December 2006, pp. 2137 – 2141, ISSN 1109-2742

38. Găşpăresc, G., Dughir, C. , Ignea, A., *Research of Electromagnetic Disturbances Using A Disturbance Generator with GUI*, Simpozionul Interdisciplinar de Compatibilitate Electromagnetica "SICEM 2006", Bucuresti - 9 noiembrie 2006, ISSN.

39. Găşpăresc, G., Dughir, C., *Building A Transient Disturbances Generator With Graphical User Interface in Matlab*, Buletinul Stiintific al Universitatii "Politehnica"

din Timisoara, septembrie 2006, Timisoara, Tom 51(65), Fascicola 1, 2006, ISSN 1583-3380, "Etc2006", p. 49-52.

40. Găşpăresc G., Dughir C., *Electromagnetic Disturbances Generator with Graphical User Interface Build in Matlab*, Scientific Bulletin of the "Gheorghe Asachi" Technical University of Iasi, Trans. Electrotechnics, Electronics, Energetics, Tom LII (LVI), Fasc. 5B, 2006, ISSN 1223-8139, "EPE 2006", pp. 826-831.

41. Găşpăresc, G., Dughir, C., Stoica, L., *Signal Generator for Usual Waveforms and Electromagnetic Disturbances with Graphical User Interface*, Lucrările ştiinţifice ale simpozionului internaţional multidisciplinar "Universitaria Simpro" 2006, Editura Universitas, Petroşani, 13-14 octombrie 2006, ISSN 1842-4449, p. 118-121.

42. Gontean, A., Oteşteanu, M., Rugină, S., Sârbu-Doagă, G., *Versatile Communication Solution for PLC Based Control Systems*, WSEAS Transactions on Communications, Issue 12, Volume 5, December 2006, pp. 2137 – 2141, ISSN 1109-2742.

43. Gui, V., Fuiorea, D., Toma, C. I., Alexa, F., **„***Video Object segmentation and Tracking using Kernel Density Estimation and Region Merging*", Proceedings of the 12th International Conference NETTIES 2006, 6-9 september 2006, Timişoara, pag. 237-240

44. Gui, V., Fuiorea, D., Toma, C. I., Alexa, F., *"Robust 2D Moving Object Segmentation and Tracking in Video Sequences"* accepted to WSEAS conference, AC06 Tenerfie, dec.2006

45. Popa, M., Ionel, R. , *Internet and LAN Connected Embedded Virtual Instrumentation*, CONTI 2006, organized by The Faculty of Automation and Computers, "Politehnica" University, Timisoara.

46. Ignea, A., Dughir, C., Găşpăresc, G., *Calibration Method for Nonlinear Voltage Divider Used as Preconditioning Circuit in the Electrical Power Network Disturbances Monitoring System,* Simpozionul Interdisciplinar de Compatibilitate Electromagnetica "SICEM 2006",ISSN Bucuresti - 9 noiembrie 2006.

47. Ignea, A., *Measuring receivers testing with comb generators in round-robin system*, Electromagnetic Compatibility International Symposium Bucharest November 2006, SICEM 2006.

48. Ignea, A., Mihăiuţi, A., *Signals Level Estimation from Radio Broadcasting Stations*, Electromagnetic Compatibility International Symposium Bucharest November 2006, SICEM 2006.

49. Kleinkes, M., Ignea, A., Neddermeyer, W., Schnell, M., *Interpolation of linear track movements of modern industrial robots*, Etc-06.

50. Serafin, P., Ignea, A., *Application for Frequent Pattern Recognition in Telecommunication Alarm Logs*, Scientific Bulletin of the "Politehnica" University of Timişoara, Transactions on Electronics and Communications, Vol.51(65), No.2, 2006, pp. , ISSN 1583-3380.

51. Popa, M., Ionel, R., Voicu, G., Marcu, M., *Educational Virtual Instrumentation Application for System Identification,* Instrumentation and Measurement Conference 2006, Sorento, Italy.

52. Isar A., Isar D., Adam I., *Denoising Sonar Images*, Proceedings of The Romanian Academy, Series A, Volume 7, Number 2 May - August 2006, pp. 1-14, ISSN: 1454-8267

53. Atto A. M, Pastor. D, Isar. A, *On the Asymptotic Decorrelation of the Wavelet Packet Coefficients of a Wide-Sense Stationary Random Process*, Scientific Bulletin of Politehnica Univ. of Timisoara, Trans. on Electronics and Telecommunications, tom 51(65), fasc.2, pp. 146-151, ISSN 1583-3380, pp. 123-128, ISSN 1583-3380..

54. Quinquis A., Isar D., Isar A., *Multi-scale MAP Denoising of SAR Images*, Proceedings of IEEE International Conference Oceans'06, Boston, USA, September 20-23, ISBN 1998-09-28.

55. Isar, A., Moga, S., Nafornita, I., Augustin M., Fablet, R., Lurton, X., Isar, D., *Local Adaptive Bivariate Shrinkage with Reduced Sensitivity*, Round table: New Technologies and Trends in IT & Communications, 6th Int. Conference Communications 2006, June 8-10, 2006, Bucharest, Romania, pp. 67-74, ISBN(10) 973-718-496-3 , ISBN(13) 978-973-718-496-2, pp. 67-74.

56. Isar, A, Moga, S., Nafornita, C., Oltean, M., Adam, I., *Image Denoising Using Wavelet Transforms With Enhanced Diversity*, Proceedings of Communications 2006, Bucharest, June, 2006, ISBN (10) 973-718-479-3, ISBN (13) 978-973-718-479-5, pp. pp.161-164.

57. Isar. A. Oltean. M, Isar. D, Bora. M, *Denoising base-band communication signals*, Proceedings of International Conference OPTIM'06, Brasov, May, 20-21, 2006, vol.IV, ISBN-973-635-702-3.

58. Ivan, C., Lascu, D., Popescu, V., *A New Averaged Switch Model Including Conduction Losses for PWM Converters Operating in Discontinuous Inductor Current Mode*, Facta Universitatis (Niš), Ser.: Elec. Energ. vol. 19, no. 2, August 2006, pp. 219-230.

59. Ivan, C., Lascu, D., Popescu, V., *Averaged Switch Modelling Including Conduction Losses for PWM Converters Operating in Discontinuous Capacitor Voltage Mode*, International Review of Electrical Engineering (IRE), Vol. 1, No 1, March-April 2006, pp.137-143, ISSN 1827-6600.

60. Ivan, C., Lascu**,** D., Popescu, V., *Instability of dc-dc Converters at the Boundary Between CCM and Discontinuous Capacitor Voltage Mode*, Scientific Bulletin of the „Politehnica" University of Timişoara, Transactions on Electronics and Telecommunications, Tom 51 (65), Fasc. 1, 2006, pp. 106-110, ISSN 1583-3380.

61. Ivan, C., Lascu, D., Popescu, V., *PFC Circuits Modelling*, Analele Universității din Oradea, Fasc. Electrotehnică, Secțiunea Electronică, Proceedings of the 6th International Conference on Renewable Sources and Environmental Electro-Technologies, RSEE 2006 June 8-10, Stâna de Vale, Romania, 2006, pp. 58-63, ISSN 1454-9239.

62. Ivan, C., Popescu, V., *Chaos in switching power converters*, Scientific Bulletin of the „Politehnica" University of Timişoara, Transactions on Electronics and Telecommunications Tom 51, Fasc. 1, 2006, pp 53-59, ISSN 1583-3380..

63. Ivan, C., Popescu**,** V., *PFC circuits control techniques*, Analele Universitatii din Oradea, Fasc. Electrot. Sect. Electronica, 2006, pp 53-58.

64. Kovaci, M., De Baynast, A., Balta, H., Nafornita, M., *Performance of Multi Binary Turbo-Codes on Nakagami Flat Fading Channels*, Scientific Bulletin of the Politehnica University of Timisoara, Transactions on Electronics and Communications, Tom 51-65, Fasc. 2, 2006, pp.140-145, ISSN 1583-3380.

65. Kovaci, M., Balta, H., Nafornita, M., *Performance of Multi Binary Turbo Codes on Rayleigh Flat Fading Transmission Channels*, Analele Universității din Oradea, Fascicola Electrotehnică, Secțiunea Electronică, 2006, ISSN 1454-9239, pp. 64-67

66. Lascu, D., Popescu, V., Negoițescu, D., Popovici, A., Lascu, M., Băbăiță, M., *A Novel Step-Up DC-DC Converter and Its Applications,* WSEAS Transactions on Systems, Issue 4, Volume 5, April 2006, pp. 743-750, ISSN 1109-2777.

67. Lascu, D., Lascu, M., Lie, I., Tănase, M., *A New Quadratic Boost Converter with PFC Applications,* Proceedings of the 10th WSEAS International Conference on CIRCUITS, Vouliagmeni, Athens, Greece, July 10-12, 2006, pp 223-228.

68. Lascu, D., Lascu, M., Tănase, M.E., Lie, I., *A Novel Step-Up Converter and Its Applications,* WSEAS Transactions on Circuits and Systems, Issue 8, Volume 5, August 2006, pp. 1139-1146, ISSN 1109-2734.

69. Lascu**,** D., Negoițescu, D., Lascu, M. Popescu, V., *A Quadratic Boost Converter with PFC Applications,* Scientific Bulletin of the „Politehnica" University of Timişoara, Transactions on Electronics and Telecommunications, Tom 51 (65), Fasc. 1, 2006, pp. 16-21, ISSN 1583-3380.

70. Lascu, D., van Duijsen, P., *An Improved Integration-Reset Controlled Power Factor Correction Sepic Rectifier with Lower Distortion*, 2006 Taiwan Power

Electronics Conference & Exhibition, Yunlin, R.O.C., September 8-9, 2006, pp. 197-292.

71. Lascu, M., Lascu, D., Lie, I., Tănase, M., *Compression, Noise Removal and Comparison in Digital Mammography using LabVIEW,* Proceedings of the 10th WSEAS International Conference on COMPUTERS, Vouliagmeni, Athens, Greece, July 13-15, 2006, pp 671-676.

72. Lascu, M., Lascu, D., *Mammography Using LabVIEW*, WSEAS Transactions on Systems, Issue 4, Volume 5, April 2006, pp. 735-742, ISSN 1109-2777.

73. Lascu, M., Lascu, D., Tănase, M., Lie, I., *Image Processing Techniques in Digital Mammography using LabVIEW*, WSEAS Transactions on Circuits and Systems, Issue 7, Volume 5, August 2006, pp. 887-894, ISSN 1109-2734.

74. Lie, I., Tănase, M. E., Lascu**,** D., Lascu, M., *Compact Ultrasonic Beamformer Based on Delta-Sigma Modulation*, WSEAS Transactions on Circuits and Systems, Issue 8, Volume 5, August 2006, pp. 1315-1332, ISSN 1109-2734.

75. Lie, I., Tănase, M. E., Lascu, D., Lascu, M., *Ultrasonic Beamforming with Delta-Sigma Modulators,* Proceedings of the 10th WSEAS International Conference on CIRCUITS, Vouliagmeni, Athens, Greece, July 10-12, 2006, pp 344-349.

76. Maranescu V., Căleanu C., Toma C., *"High input, wide output voltage range linear regulators"*, Scientific Bulletin of the „Politehnica" University of Timişoara, Transactions on Electronics and Telecommunications, Tom 51(65), Fasc. 1, pp.205-208, ISSN 1583-3380.

77. Maranescu V., Ciugudean M., Toma C., *"Integrated voltage regulators, Safe Operating Area - real time shift with temperature"*, microCAD 2006 International Scientific Conference, Section Electrotechnics and Electronics, pp. 23-28, Miskolc, 16-17 March 2006. ISBN 963 661 710 4.

78. Maranescu V**.**, Pleşu N., Căleanu C., Toma C. *"Accurate Modeling of Carbon-Polymer Composites Thermal Path in High Power Density Electronic Devices"*, Annals of Vest University of Timişoara and Romanian Academy, vol.15, No.1, pp.65-74, Timişoara, 2006. ISSN 1224-9513.

79. Maranescu V., Pleşu N., Toma C., Căleanu C., Tănase M., "*Nonlinear Thermal Impedance Electrical Model for Polymers Used in Electronic Industry*", Materiale Plastice, Iunie 2006, vol.43, pp 165-169, 2006. ISSN 0025-5289.

80. Mihăescu, A., Oteşteanu, M., Ghişe, L., Telescu, M., Besnard, P., *Reduced Size Model Method for Diffuse Optical Indoor Wireless Channel Characterization*, WSEAS Transactions on Communications, Issue 2, Volume 5, February 2006, pp. 155 – 160, ISSN 1109 – 2742

81. Mischie, S., *Frequency Measurement above Nyquist Limit Using the Counting of Zero Crossings*, Rev. Roum. Sci. Techn.– Électrotechn. et Énerg, nr.3, 2006, pp.369-380, ISSN: 0035-4066.

82. Mischie, S., Toma, L., *Extending the Frequency Measurement of a Single Sinusoid above the Nyquist Limit based on Zero Crossings Method,* Facta Universitatis Nis, Series: Electronics and Energetics, vol.19, nr.1, April 2006, pp.1-11 YU ISSN 0353-3670.

83. Ordodi, V. L., Păunescu, V., Mischie, S., Ignea, A., Toma, O., Ionac, M., Mic, A. A., Săndesc, D., Mic, F. A., *Improved Electrodes for Electrical Defibrillation of Rats*, Journal of the American Association for Laboratory Animal Science (JAALAS), Vol.45, No 6, November 2006, pp. 46-49, ISSN 1559-6109.

84. Terebes, R., Borda M., Nafornita I., *Image filtering and enhancement using directional and anisotropic diffusion techniques*, Scientific Bulletin of the Politehnica University of Timisoara, Transactions on Electronics and Communications, Tom 51(65), fasc. 2, pp. 85-90, ISSN 1583-3380.

85. Borda, M., Nafornita, I., *Digital Rights Management – State of Art and Trends*, Round table: New Technologies and Trends in IT & Communications, 6th Int. Conference Communications 2006, June 8-10, 2006, Bucharest, Romania, pp.23-30, ISBN 973-718-496-3 (978-973-718-496-2)

86. Nafornita, C., Isar, A., Borda, M., *Improved Pixel-Wise Masking for Image Watermarking*, in Multimedia Content Representation, Classification and Security, Sept. 11-13, 2006, Istanbul, Turkey, Lecture Notes in Computer Science, Springer-Verlag, pp. 90-97, ISSN 0302-9743 / ISBN 978-3-540-39392-4.

87. Nafornita, C., Isar, A., Borda, M., *Pixel-wise masking for watermarking using local standard deviation and wavelet compression*, Scientific Bulletin of Politehnica Univ. of Timisoara, Trans. on Electronics and Telecommunications, tom 51(65), fasc.2, pp. 146-151, 2006, Timisoara, Romania ISSN 1583-3380.

88. Popescu, I.; Nikitopoulos, D.; Nafornita, I.; Constantinou, P; *ANN Prediction Models for Indoor Environment*, in Proc. of IEEE International Conference on Wireless and Mobile Computing, Networking and Communications, 2006. (WiMob'2006), June 19-21, 2006, Montreal, Canada, pp.366 - 371, ISBN: 1-4244-0494-0

89. Popescu, I., Nikitopoulos, D., Nafornita, I.; Constantinou, P., *ANN Prediction Models for Outdoor Environment*, 17th IEEE International Symposium on Personal Indoor and Mobile Radio PIMRC 2006, Sept. 11-14, 2006, Helsinki, Finland

90. Popescu, I., Nikitopoulos, D., Nafornita, I., Constantinou, P., *Comparison of ANN based Models for Path Loss Prediction in Indoor Environment*, 2006, 64th Semi-Annual IEEE Vehicular Technology Conference, VTC 2006, Sept. 25-28, Montreal, Canada

91. Negoiţescu, D., Lascu, D**.,** Popescu, V., *A PFC Circuit Based on a DCM Operated Boost converter with Integration Control*, Scientific Bulletin of the „Politehnica" University of Timişoara, Transactions on Electronics and Telecommunications, Tom 51 (65), Fasc. 1, 2006, pp. 11-15, ISSN 1583-3380.

92. Oltean, M., Adafinoaei, V., *ECG Signal Denoising in the Diversity Enhanced Wavelet Domain*, Scientific Bulletin of the Politehnica University of Timisoara, Trans. on Electronics and Communications, Tom 51 (65), Fascicola 2, 2006, pp. 63-68.

93. Oltean, M., Boucher, J.M., *MAP Filtering in the Diversity Enhanced Wavelet Domain Applied to ECG Signals Denoising*, Proceedings of International Conference on Speech, Acoustic and Signal Processing ICASSP 2006, Toulouse, France.

94. Oteşteanu, M., Gontean, A., Sârbu-Doagă, G., Rugină, S., *Software Environment for the Laser Precipitation Monitor*, *Proceedings of the 2nd WSEAS International Conference on Dynamical Systems and Control (CONTROL '06),* Bucharest, Romania, 2006, pp. 53 – 58, CD-ROM, ISSN 1790-5117, ISBN 960-8457-54-8.

95. Papazian, P., Popescu, V., Băbăiţă, M**.,** Filip, A., *Using the PIC16F84 Microcontroller in Signal Generating Techniques,* EMES 2006, Proceedings of the 9'th International Conference on Engineering of Modern Electric Systems, 26-28 May, 2006, Analele Universităţii din Oradea, Fascicola Electrotehnică, Secţiunea Electronică, ISSN 1454-9239, pg.25-28.

96. Papazian, P., Popescu, V., Babaita, M., *Using PIC 16F84 microcontroller in signal generation technics,* Analele Universitatii din Oradea, Fasc. Electrot. Sect. Electronica, 2006, pp 84-89.

97. Popa, D., Oteşteanu, M., *Real-Time Data Analyzer*, Proceedings of European DSP Education & Research Symposium (EDERS 2006), Munchen, Germany, 2006, pp. 345 – 352, ISBN 0-9552047-1-2, 978-0-9552047-1-5

98. Popovici, A, Popescu, V., Băbăiţă M., Papazian P., *A New Technique for PFC Rectifiers Design*, EMES 2006, Proceedings of the 9'th International Conference on Engeneering of Modern Electric Systems, 26-28 May, 2006, Analele Universităţii din Oradea, Fascicola Electrotehnică, Secţiunea Electronică, ISSN 1454-9239, pg.25-28.

99. Tomşe, M., Pasca, S., Popescu, V., *The generalized averaging methods used to model resonant inverter for induction heating,* Analele Universitatii din Oradea, Fasc. Electrot. Sect. Electronica, 2006, pp 120-125.

100. Popovici, A., Popescu V., Băbăiţă M**.,** Lascu D., Negoiţescu D., *The Analysis Of Input Filter For Matrix Converters*, WSEAS TRANSACTIONS on SIGNAL PROCESSING, Issue 2, Volume 2, February 2006, ISSN: 1790-5022, pg 182-189.

101. Salagean, M., Nafornita, M., *Some Routing Trends*, Analele Universitatii din Oradea, Fascicula Electrotehnica, Sectiunea Electronica, pp. 98-102, ISSN 1454-9239.

102. Rugină, S., Sârbu-Doagă, G., Gontean, A., Oteşteanu, M., *Analysis and Modeling of Rain Characteristics*, Scientific Bulletin of the *Politehnica* University of Timişoara, Romania*,* Transactions on Electronics and Telecommunication*s*, Issue 1, Volume 51(65), 2006, pp. 215 - 218, ISSN 1583-3380.

103. Stoica, L., *A New Algorithm for Determining tha Coefficients in B-spline Interpolation*, Scientific Bulletin of the "Politehnica" University of Timişoara, Transactions on Electronics and Communications, Vol.51(65), No.2, 2006, pp. 5-8, ISSN 1583-3380.

104. Stoica, L., *Contributions in Recursive Filtering for B-spline Interpolation in Signal Processing*, Scientific Bulletin of the "Politehnica" University of Timişoara, Transactions on Electronics and Communications, Vol.51(65), No.2, 2006, pp. 44-49, ISSN 1583-3380.

105.Stoica, L., *The Study of a Divergent Algorithm for Calculating the B-Spline Coefficients,* Proceedings of the VIIIth International Simposium "Young people and Multidisciplinary research", Timişoara, may 2006, pp. 251-256, ISBN (10) 973-8359-39-2 ; ISBN (13) 978-973-8359-39-0.

106.Frigură-Iliasa, F.M., Popa, C., Zeng, E., Stoica, L., *Some Aspects Concerning the Functional Limits of a ZnO Based Varistor*, Proceedings "Electrical Engineering, Electronics, Automation", University of Rousse "Angel Kanchev", Bulgaria, Vol.45, No.3.1, 2006, pp. 56-60, ISSN 1311-3321.

107.Frigură-Iliasa, F.M., Popa, C., Zeng, E., Stoica, L., *Some Improvements Concerning the Manufacturing Process of ZnO Based Varistors*, Proceedings "Electrical Engineering, Electronics, Automation", University of Rousse "Angel Kanchev", Bulgaria, Vol.45, No.3.1, 2006, pp. 51-55, ISSN 1311-3321.

108. Şchiop, A., Popescu, V., *Considerations on trapezoidal modulation for current source inverters,* Analele Universitatii din Oradea, Fasc. Electrot. Sect. Electronica, 2006, pp 116-120.

109. Şchiop, A., Popescu, V., *Experimentals results regarding the using UC3854 circuit for power factor correction in the drives with asyncronous motors*, Scientific Bulletin of the „Politehnica" University of Timişoara, Transactions on Electronics and Telecommunications, Tom 51, Fasc. 1, 2006, pp 83-89, ISSN 1583-3380.

110.Tănase, M. E., Lie, I., Lascu, D., Lascu, M., *About the FPGA Implementation in the Electronic Equipment for the Movement Properties Telemetry,* Proce9edings of the 10th WSEAS International Conference on CIRCUITS, Vouliagmeni, Athens, Greece, July 10-12, 2006, pp 45-49.

111.Tănase, M.E., Lie, I., Lascu**,** D., Lascu, M., *Contribution Regarding Electronic Equipment for Motion Features Telemetring,* WSEAS Transactions on Circuits and Systems, Issue 8, Volume 5, August 2006, pp. 1277-1283, ISSN 1109-2734.

112.Tiponuț, V., Gacsádi, A., Căleanu, C., Gavriluț, I., *Neural network guided robot collectivity - An experimental setup*, Proceedings of the 7th WSEAS International Conference on Neural Networks, pp. 41-46, Cavtat, Croatia, 2006.

113.Tiponuț, V., Gacsádi, A., Țepelea, L., Lar, C., Gavriluț, I., *Integrated environment for assisted movement of visually impaired*, Proceedings of the 15th International Workshop on Robotics in Alpe-Adria-Danube Region, (RAAD 2006), ISBN: 9637154 48 5, pp.234-239, Balatonfüred, Hungary, 2006.

114.Tiponuț, V., Gavriluț, I., Căleanu, C., Gacsádi, A., *Development of a neural network guided mobile robot collectivity*, WSEAS Transactions on Circuits and Systems, ISSN 1109-2734, Issue 6, Vol. 5 june 2006, pp. 805-812.

115.Tiponuț, V., Haraszy, Z., Ianchis, D., *Tools for Student's Project Development Acceleration,* Proceedings of the International Conference "Applied Electronics", 6-7 September 2006, ISBN 80-7043-442-2, pp. 209-212, Pilsen, Czech Republic, 2006.

116.Tiponuț, V., Haraszy, Z., Ianchis, D., *Using a Mobile Robot as an Educational Tool,* Proceedings of the International Conference "Applied Electronics", 6-7 September 2006, ISBN 80-7043-442-2, pp. 213-216, Pilsen, Czech Republic, 2006.

117.Toma, C.I., Tanase**,** M.E. *On the Precision in the Determination of the MovementFeatures by Doppler Radio Telemetry*, Scientific Bulletin of the „Politehnica" University of Timişoara, Transactions on Electronics and Telecommunications,, Tom 51 (65), Fascicola 1 -2 , pp. 223 – 228, 2006, ISSN 1583-3380.

118.Toma, L. , De Sabata, A., Mischie, S., *Closed-Form Variance Formula of the RPHD Single-Tone Frequency Estimator*, Facta Universitatis (Nis), Ser.: Elec. Energ. Vol. 19, no. 3, December 2006, pp. 453-464, ISSN 0353-3670

119. Vasiu, R., *Collaboration Universite - Entreprise pour le developement des curricula universitaire*, Forum *Nouvelles Technologies et Francophonie*, 22-23 Mars 2006, Timişoara, as part of *Roumanie et Francophonie. Etats Generaux:* 20-28 Mars 2006

120. Vasiu, R., Andone, D., Bucos, M., *Development of the METOIM Web Tool for Competences Self-Evaluation*, in *E-Competences for Life, Employment and Innovation*, Editors: Andras Szucs, Ingeborg Bo, Published in Vienna, Austria by EDEN (European Distance and E-Learning Network), June 2006, ISBN 963 06 0063 3, pp. 75-80

121. Vasiu, R., Andone, D., Bucos, M., Onita, M., *Approaches to Life Long Learning by Using Online Tools*, Proceedings of the International Conference on *Cognition and*

Exploratory Learning in Digital Age (CELDA 2006), Barcelona, Spain, 8-10 December 2006, ISBN 972-8924-22-4, pp. 455-456

122. Vasiu, R., Robu, N., Andone, D., Bucos, M., Onita, M., *Integration of eLearning in Romanian Technical Universities*, World Conference on Educational Multimedia, Hypermedia & Telecommunications, ED-MEDIA 2006, June 2006, Orlando, Florida, USA, published by AACE (Association for the Advancement of Computing in Education), ISBN 1-880094-59-2, pp. 121-126

123. Vasiu, R., Robu, N., *e-Learning in Romania*, Proceedings of the International Conference "Networking Entities" NETTIES 2006, Timisoara, Romania, 6-9 September, 2006, ISBN 973-638-262-1, pp. 36-38

5.2 Books

1. Mureşan, T., Gontean, A., Băbăiță, M, *Digital Circuits*, West Publishing House, Timişoara, 2006, ISBN 973-36-0416-X 218 pages, (published in Romanian).

2. Pradel, G., Căleanu, C., *Symbolic trajectory description in mobile robotics*, in V. Kordic, A. Lazinica and M. Merdan (eds.), "Mobile Robotics. Moving Intelligence", Advanced Robotic Systems, Vienna, Austria, to appear in Dec. 2006.

3. Budura G., Botoca C. *Tehnici de prelucrare neliniară a semnalelor. Aplicații,* "Politehnica" Publishing House, 2006, 200 pages, Timişoara, ISBN 973-625-292-2, (to appear in Romanian)

4. Nafornita, M., Nafornita, I., *Microwaves*. *Fundamentals*, (vol.1), Politehnica Timisoara Publishing House, 2006, 500 pages, ISBN 973-625-348-1 (978-973-625-348-5), (published in Romanian)

5. Popescu, D., Otesteanu, M., Napoli, R., Ionescu, F., Chicco, G., Covrig, M., (editors), *Proceedings of the 2nd WSEAS International Conference on Dynamical Systems and Control (CONTROL '06),* Bucharest, Romania, 2006, CD-ROM, ISSN 1790-5117, ISBN 960-8457-54-8

6. Popescu, M. O., Cepisca, C., Otesteanu, M., Andrei, H., Martin, O., Ioan, D., Simian D. (editors), *Proceedings of the 8th WSEAS International Conference on Mathematical Methods and Computational Techniques in Electrical Engineering (MMACTEE '06)*, Bucharest, Romania, 2006, CD-ROM, ISSN 1790-5117, ISBN 960-8457-54-8

7. Toma, C.I., Alexa, Fl., Vasiu, R., *Principiile televiziunii analogice si digitale (Principles of Analod and Digital Television) vol.I*, "Politehnica" Publishing House, Timişoara, 2006, 248 pages, ISBN 973-625-267-1 (published in Romanian).

8. Ignea, A., *Measurements in telecommunications,* Publishing House "Politehnica", Timişoara, 2006, 192 pages, ISBN 973-625-381-3, (published in Romanian).

9. Ignea, A., (coordinator), *Aspects concerning perturbations monitoring from a site*, Publishing House Waldpress, Timişoara, 2006, 80 pages, ISBN 973-7878-22-1, (published in Romanian).

6. Other activities

Our Faculty and its staff are deeply interested in maintaining the existing relationships with other Universities and promoting new ones.

6.1. International cooperation

Socrates/Erasmus Cooperation Agreements

Socrates/Erasmus mobility program 2006/2007
Director: Assoc. prof. dr. eng. Dan LASCU
Members: Prof.dr.eng. Viorel POPESCU
Lect. dr. eng. Adrian POPOVICI
Lect. dr. eng. Dan NEGOIȚESCU
Lect. dr.eng. Adrian POPOVICI
Assist. eng, Mircea BĂBĂIȚĂ
Partner: Fachhochschule Deggendorf, University of Applied Sciences.

ACTIVITIES AND RESULTS
The project aims to develop contacts between the two universities, between the power electronics groups. Some short intensive courses in power electronics will be held, conferences and scientific papers are intended to be written in collaboration together with students exchange.

Socrates/Erasmus mobility program 2006/2007
Director: Prof. dr. eng. Mihail TĂNASE
Partner: Bremen University, Germany

Agreement for the Academic Year 2005/2006 with the Bremen University.

ACTIVITIES AND RESULTS

Three students specialised in robotics for a duration of four months.

Socrates/Erasmus mobility program 2006/2007
Director: Lucian JURCA
Members : Prof. dr.eng. Dan STOICIU
Partner: Berufsakademie Loerrach, Germany

ACTIVITIES AND RESULTS

Two-week teaching mission of Prof. dr.eng. Dan STOICIU at Berufsakademie Loerrach

Erasmus- Socrates, 2005-2006
Director: Ioan NAFORNITA
Partners : Ecole Nationale Supérieure de l'Electronique et de ses Applications (Cergy)
Members : J.P.COCQUEREZ

Erasmus-Socrates, 2002-2006
Director: Miranda NAFORNITA
Partners : Univ. de Nantes, Ecole Polytechnique, France
Members : Safwan El Assad

Erasmus –Socrates, 2006-2007
Director : Miranda NAFORNITA
Partners : Univ. din Oviedo, Spania
Members : Samuel Ver Hoeye, Ioan Nafornita

Erasmus –Socrates, 2006-2007
University of Bremen, Germany, and "Politehnica" University of Timisoara, Romania, Local Coordonator.
Director: Prof. dr. eng. Corneliu I. TOMA
Partener: University of Bremen, AIT, Germany
Members: Prof. Dr. Eng Axel GRAESER
Prof. Dr. Eng. Mihail E. TĂNASE
Objective: Preparation of the graduation projects for 2 students.Student mobility.

Erasmus –Socrates, 2006-2007
Director: Prof. dr. eng. Marius OTEŞTEANU
Partner :
- Technical University in Ostrava, Czech Republic
Members :
- *PhD student Georgiana Sârbu-Doagă*

Erasmus –Socrates, 2006-2007 agreements – Director: Prof. dr. eng. Radu VASIU

- Oulu University of Applied Sciences, Oulu, Finland
- University of Brighton, Brighton, UK
- Universite Sophia Antipolis de Nice / IUT de Nice et de la Cote d'Azur, France
- TEI Piraeus, Athens, Greece
- University of Ulm, Germany
- University of Oldenburg, Germany
- University of La Rochelle, France
- University of Appli
- ed Sciences of St.Poelten, Austria

Erasmus –Socrates, 2006-2007
Director: Prof. dr. eng. Dan STOICIU
Members: Prof. dr. eng. Aldo DE SABATA
Assoc prof. dr. eng. Mihaela LASCU
Lecturer. dr. eng. Lucian JURCA
Partners : IUT Rennes 1, France

ACTIVITIES AND RESULTS

- One-week teaching mission at the Faculty of Electronics and Telecomm. for Prof. Anne-Claire SALAUN from Universite de Rennes 1
- One-week teaching mission at the Faculty of Electronics and Telecommunications of Prof. Herve GAUVRIT from Universite de Rennes 1.
- Five students from IUT Rennes, France developed and sustained their diploma theses under the guidance of the above mentioned professors.

Erasmus –Socrates, 2006-2007
Director: Aldo DE SABATA
Partners : Politecnico di Torino, Italy

ACTIVITIES AND RESULTS

- One-week mobility Torino-Timisoara, prof. Ladislau Matekovits, for a course on the Smith Chart (8 hours) for third years students in Applied Electronics;
- One- week mobility Timisoara-Torino, prof. Aldo de Sabata, for a course on Scattering Parameters (8 hours) for third year students in Electronics, Second faculty of Electronics of Vercelli.

Erasmus –Socrates, 2006-2007
Director: Daniel BELEGA
Partner : Universite d'Angers, France

ACTIVITIES AND RESULTS

Two students from IUT Angers developed and sustained their diploma theses under the guidance of professors from the department.

6.2 The International Symposium of Electronics and Telecommunications – "ETc 2006"

The symposium is organized within our faculty every two years, since 1994, and has increased continuously in quality and quantity of submitted papers. This year, the Symposium took place in 21 and 22 September. The International Scientific Committee acceped 89 papers for presentation and publication out of 122 submitted, resulting a rejection ratio of 27%. Details can be found at
http://www.etc.upt.ro/conferinta/home.php

The contents of the Symposium Proceedings are listed below. Full text can be downloaded from http://hermes.etc.utt.ro/bulletin/bulletin.html#past_issues

Scientific Bulletin of the "Politehnica" University of Timisoara
Transactions on Electronics and Telecommunications
Vol. 51 (65), No. 1, 2006, ISSN 1583-3380, Proceedings of the 7th International Symposium on Electronics and Telecommunications Etc 2006, Timişoara, Romania, 21-23 Sept. 2006
Contents

Alin Tisan, Ciprian Gavrincea, Ştefan Oniga - A Generic Building Block for Hebbian Neural Network with On-Chip Learning **5**

Abstract – In this paper, we present a digital hardware implementation of an artificial neuron on-chip unsupervised trained with Hebbian rule. The main characteristics of this solution are on-chip learning algorithm implementation and high reconfiguration capability and operation under real time constraints.
Keywords: fpga, learning on-chip, ANN.

Robert Pucher, Karl Pucher – A New 450 kW Electric Motor – It Can Withstand Temperature Of 400°C Over A Period Of Two Hours **9**

Abstract – Due to national guideline RVS 9.261, a heat resistance of 400°C over a period of 120 minutes has to be verified for exhaust ventilators in Austria. For this reason a 450 kW electric motor was tested in a chamber in a 400°C environment. The test gave evidence that the motor could be operated under load for approximately 165 minutes without serious problems.
Keywords: Fire, Road Tunnel, Heat Resistance, RVS 9.261.

Dan Negoiţescu, Dan Lascu, Viorel Popescu - A PFC Circuit Based on a DCM Operated BOOST Converter with Integration Control **11**

Abstract – In the present paper is presented a power factor correction circuit based on a DCM operated BOOST converter. The proposed circuit uses an integration control method having the main benefit that it does not need input current sensing. There are also presented some simulation results and the main merit parameters for the proposed circuit.
Keywords: DCM BOOST converter, power factor circuit, integration control

Dan Lascu, Dan Negoiţescu, Mihaela Lascu, Viorel Popescu - A Quadratic Boost Converter with PFC Applications **16**

Abstract – A novel quadratic boost converter capable of delivering a high output voltage is introduced. Dc-dc operation in continuous conduction mode (CCM) and discontinuous inductor current mode (DICM) are analyzed. A simple and versatile feedforward (FF) circuit is proposed in order to be used with the new converter when operated in CCM. Another application is the use of the converter as a power factor correction (PFC) circuit. At low power levels DICM operation is chosen because of the converter natural capability of emulating a resistor at low frequency. Design equations, simulation results and merit parameters are presented for all the investigated topologies.
Keywords: converter synthesis, quadratic converters, feedforward, power factor correction, simulation.

Ossama M. Elgendy, A.-M. A. Abass, Ahmed M.A. Mahmoud, A.D. Alkoshery - Active compensation in a low voltage network comprises power factor correction capacitor with harmonic current producing loads **22**

Abstract – In this paper, a compensation strategy for a low-voltage network comprises a power factor correction capacitor and non- linear loads connected to the same load-buss is investigated. The loads in the low- voltage network can be classified, from the harmonics point of view, into harmonic current producing loads, harmonic voltage producing loads and harmonic sensitive loads. The compensation in the low -voltage side of a power network is more reliable, efficient, economic and straightforward. The idea here stems from the fact that when applying a pollution treatment for a river, it is not practical, in all cases, to establish a treatment unit across the river. The more reliable solution is to clean and purify those outlets discharging into the river individually. If this concept could be generalized in industry, it is logical that the cost of applying the proposed compensation strategy to an industrial unit would not be comparable either to the price of the production line or to the penalties paid to authority on the long run.

Monica Sabina Crainic - AMR Gas Meters System by Radio - A New Trend in Natural Gas Metering Technology in Romania **28**

Abstract – Natural gas is a non-regenerable energy source. For this motive it must be managed properly to protect it for future generation. Proper management of natural gas reserves requires submetering. Submetering of natural gas consumption and revenue collection is traditionally accomplished using diaphragm gas meter. To resolve some problem of revenue collection new technologies liken automatic meter reading is implemented. In this context we at AEM Luxten Lighting Co produce a radio module for automatic gas meters reading and the reading system for this gas meters.

Keywords: *flowmeters, diaphragm gas meter, natural gas submetering, radio module for gas meters reading.*

Lelia Feştilă, Lorant Andras Szolga, Mihaela Cîrlugea, Mihaela Gordan - An Analog Computing Circuit for SVM classifiers **32**

Abstract – We propose an analog nonlinear current mode circuit for computing the decision function in a SVM classifier based on radial basis kernels. The validity of design and operation was proved by simulations.

Keywords: SVM, Euclidian distance, analog computing, classifier.

Vintilă Florin Filipescu - Automatic System for the Wheat Grind Process **38**

Abstract – This paper intends to present a new constructive, modern and reliable variant, of an automatic system that controls the electrovalves of the filter with aspiration in the technological process of wheat grinding; this variant implies a low cost price and an easy upkeep.

Keywords: *technological process, automatic system, lapses of time, electrovalves, microcontroller, program.*

Ladislau Matekovits, Aldo De Sabata, Paola Pirinoli, Mario Orefice - Broadband measurement of the refractive index using microstrip lines **44**

Abstract – Measurement methods based on Vector Network Analyzer, for the determination of the refractive index of a medium, are described. The refractive index is obtained from the phase velocity of the radiofrequency signal along a microstrip line embedded in the considered medium. Simple structures are used for this purpose and advantages and disadvantages of different methods are discussed.

Keywords: *microstrip lines, effective dielectric constant, Network Analyzer, education, microwaves.*

Gabriel Găşpăresc, Ciprian Dughir - Building A Transient Disturbances Generator With Graphical User Interface in Matlab **49**

Abstract –This paper describes an implementation method of a transient disturbances generator with graphical user interface in Matlab environment, using an integrated codec or a sound card, the advantages and the disadvantages of this solution, in the actual context of increasing of the interest for ensure power quality and disturbances study which can affect it.
Keywords: *transient disturbances, sound card, graphical user interface, power supply quality, electromagnetic compatibility.*

Corina M. Ivan, Viorel Popescu - Chaos in Switching Power Converters **53**
Abstract – This paper presents an overview of the complex behaviour of the switching power converters. The power electronics circuits, due to their nonlinearity, exhibits a variety of complex behaviour, such as: sudden change of operating regime, subharmonic and chaotic operation, etc. This behaviour can occur when some parameters of the circuit are varied.
Keywords: *switching power converters, nonlinear behaviour, chaos.*

Ştefan Cososchi, Rodica Strungaru, G. Mihaela Ungureanu - Comparison of LDA and RBF-NN in EEG Features Classification for Motor Imagery **59**
Abstract – This paper presents an approach that uses self-organizing fuzzy neural network based time series prediction to extract the EEG features in time domain. EEG signals from two electrodes placed on the scalp over the motor cortex are predicted by a single fuzzy neural network. Features derived from the mean squared error of the predictions and from the mean squared of the predicted signals are extracted from EEG data within a sliding window using two auto-organizing fuzzy neural networks with multi inputs and a single output. The features are classified by linear discriminant analysis and radial-basis function neural network.
Keywords: *EEG, neurofuzzy network, prediction, auto adaptation, LDA, RBF-NN.*

Kay Böhnke - Data structures for industrial laser range sensors **64**
Abstract – This paper describes the implementation of data structures based on data acquisition of active optical range sensors. At first, three available industrial laser sensors are introduced and compared exemplarily. Based on the raw data structure of these sensors an abstract data structure and the possibility of the evaluation of depth information are presented. Finally industrial applications are presented which are using the introduced data structure.
Keywords: *laser range sensors, 3D models, data representations.*

Gabriel Oltean, Ioana Oltean, Sorin Hintea – DEIC: Web-Based Materials to Teach Digital Electronics **69**
Abstract – The paper describes a Web-based Digital Electronics Interactive Course (DEIC). DEIC transmits knowledge to the students by means of static text, figures, tables, and by interactive simulation of some digital circuits. It also offers different kinds of interactive tests with prompt feedback for self-assessment. Students' surveys show that they found the software easy to use and felt it helped them improve their skills and understanding.
Keywords: *computer-based learning, digital electronics, self-assessment, interactive simulation.*

Adriana Balta, Horia Balta, Adrian Chiriac - Determination of Error Probability Concerning the Study of Vibrations at the Rotary Knitting Machine with two Cylinders, of MATEC Type **74**
Abstract – In the normal working of a knitting machine, defects appear in the fabric because of the uninterception of the yarn by the needle. Their causes, excluding the irreversible defects, are the mechanical or electrical shocks, vibrations etc. In this paper it is presented a study about mechanical vibrations produced by the knitting machine Matec, with the purpose to estimate the probability of uninterception of the yarn by the knitting needle. There were considered a few of the main normal working regimes of the machine.

Keywords: knitting machine, mechanical vibrations, statistical analyze, error probability.

Jiri Kotzian, Zdenek Slanina, Vilem Srovnal - Embedded system for remote temperature sensor's net **79**

Abstract – This paper describe solution of remote temperature measurement problem in two areas. First area is remote temperature measurement in prospecting holes on mine dumps to prevent risk of fire. Second area is remote temperature measurement in heat pump to prevent freeze of earth. The measuring system is using battery powered embedded system ensuring service time up to 12 months. Due good covering by signal in normal and demanding terrain the GSM communication system is used. The system has three options of sensor depending on temperature range and depth of boreholes.

Keywords: sensor's net, control technology, microprocessor control, remote control, monitoring.

Adrian Şchiop, Viorel Popescu - Experimental results regarding the using of the UC3854 circuit for power factor correction in the drives with asynchronous motors .. **83**

Abstract – In this paper are presented experimental results obtained by simulation, using PSpice model of the UC3854 circuit and the average model of the boost converter, and by measurements on experimental stand, regarding the manner in which the capacitor from voltage control loop affects the dynamic response of power factor circuit at voltage supply changes. Also, it was studied the manner in which the values of this capacitor affects the power factor and the total harmonic distortion factor. The efficiency of power factor circuit depending on output power and power factor modification depending on asynchronous motor speed were experimental determined.

Keywords: UC3854, boost converter, power factor.

Danijela Ristić, Axel Gräser - Feedback control design for the image segmentation level in an image processing system **89**

Abstract – Inclusion of closed-loop control to overcome the problems of traditional open-loop image processing is proposed. The basic principles and features of feedback control in image processing are illustrated by the example of the recognition of 3D characters on a metallic surface. The feedback control for improving the image segmentation and consequently the character recognition in an unevenly illuminated image is presented.

Keywords: image processing, character recognition, local thresholding, feedback control.

I. K. Bousserhane, A. Hazzab, M. Rahli, B. Mazari, M. Kamli - Fuzzy Sliding Mode Decoupling Controller Design Based on Indirect Field Orientation for Induction Motor Drive **95**

Abstract – In this paper, the design of a speed control scheme based on total fuzzy-sliding mode control for indirect field-orientated induction motor (IM) is proposed. In this scheme, the motor speed is controlled by fuzzy sliding mode controller, in which the fuzzy logic controller replaces the discontinuous part of the classical SMC law (k · sign (s)). The proposed fuzzy sliding mode control operation can reduce the dependence on the motor parameters and disturbance uncertainties. The decoupling scheme uses two fuzzy sliding mode controllers to regulate the d-axis and q-axis stator currents respectively. This new current controller exhibits several advantages such as fast dynamic response, perfect decoupling and robustness to parameter variations. Finally, the effectiveness of the complete proposed control scheme is verified by numerical simulation. The numerical validation results of the proposed scheme have presented good performances compared to the classical sliding mode control.

Keywords: induction motor, vector control, decoupling, sliding mode control and fuzzy sliding mode.

Cosmin Popa - Improved Linearity Active Resistor with Negative Equivalent Resistance **101**

Abstract – An original improved linearization technique for a CMOS active resistor will be further presented. The main advantages of the original proposed implementation are the improved linearity, the small area consumption and the improved frequency response. The new method for linearizing the $I(V)$ characteristic of the active resistor will be based on a parallel connection of two quasi-ideal circuits opposite excited and different biased, having the result of improving the circuit linearity with about an order of magnitude. Because of this original design technique, the circuit linearity is not affected by the second-order effects that alter the MOS transistor operation. The reduced complexity obtained by using a FGMOS transistor will be made maintaining the compatibility with classical technologies (the classical FGMOS device could be replaced by an original equivalent circuit using exclusively classical MOS devices). The frequency response of the circuit is very good as a result of operating all MOS transistors in the saturation region. In order to design a circuit having a negative equivalent resistance, an original, method specific to the proposed implementation of the active resistor circuit will be presented. The circuit is implemented in $0.35\ \mu\ m$. CMOS technology, the SPICE simulation confirming the theoretical estimated results and showing a linearity error under a percent for an extended input range ($\pm 500mV$) and for a small value of the supply voltage ($\pm 3V$).

Keywords: *active resistor circuit, linearity error, complementary functions, second-order effects.*

Corina M. Ivan, Dan Lascu, Viorel Popescu - Instability of Dc-Dc Converters at the Boundary Between CCM and Discontinuous Capacitor Voltage Mode **106**

Abstract – In this paper, the operating mode between Continuous Conduction Mode (CCM) and Discontinuous Capacitor Voltage Mode (DCVM) of dc-dc converters is investigated. A large-signal model for the switching network is obtained. The small-signal averaged model is derived, and it is used to obtain analytical expressions for the small-signal transfer functions, for the ĆUK, SEPIC and ZETA converters. It is shown that the transfer functions exhibit at least one right half-plane (RHP) pole. This pole cannot be eliminated by varying the circuit parameters. From this it is concluded that the operating mode between CCM and DCVM is unstable and unusable.

Keywords: *boundary conduction mode, discontinuous capacitor voltage mode, averaged switch models.*

M. Kleinkes, A. Ignea, W. Neddermeyer, M. Schnell - Interpolation of linear track movements of modern industrial robots **111**

Abstract –Integration of linear track movements in the robot control is a significant part of the accuracy improvement process of modern robotics. For this, the linear track profile has to be analysed for getting a continous description of its inaccuracies for correcting the robot's end effector position for arbitrary points. This analysis bases in the first step on a discrete measurement of the linear track in special sampling points. In the second step an interpolation between the sampling points is done. In this article some of the possible interpolation methods for creating a continous description of the linear track were tested.

Keywords: *industrial robot, accuracy, 7^{th} axis, linear track, interpolation.*

Rus Cristian Matei, Lelia Feştilă, Sorin Hintea - Linearity Considerations for Adaptively Biased Transconductors with Applications in Continuous Time Filters .. **116**

Abstract – This paper discuses the approach of increasing the linearity of transconductor cells using adaptive bias currents. Adaptive biasing proves to be a powerful technique that may be used to obtain a very linear voltage-to-current conversion. The advantages of this method are its simplicity and its applicability in designing current-mode circuits that can handle wide dynamic range signals without introducing significant (harmonic) distortions. In this paper a 6^{th} order, gm-C,

Chebyshev band-pass filter is designed to demonstrate the excellent linearity of adaptively-biased transconductors.
Keywords: *transconductor, adaptive bias current.*

Lelia Feştilă, Robert Groza, Lorand Szolga, Sorin Hintea – Log-Domain multipliers for VLSI architectures **121**

Abstract – We propose new modular configurations for one-, two-, and four quadrant multipliers in order to be used in large dimension circuits, like analog support vector machines or neural networks. Some investigations on these structures are made taking into account the real configurations and parameters of transistors in BiCMOS technology. We also underline the advantage of using such modular structures for high frequency large dimension circuits.
Keywords: Log-Domain, analog multiplier, VLSI architecture.

Zdenek Machacek, Vilem Srovnal - Methodology of Algorithms Design and Methods Using in Predictive Diagnostic System **126**

Abstract: A paper deals with analysis and development of complex methods and algorithms for evaluation designed and measured signals of predictive diagnostic system. The design and the solution of system are original and an embedded system with a digital signal processor DSP is important control unit. The paper is composed of suitable algorithms design for measured signal processing. The developed system is designed for education and development at Department of measurement and control, VSB-TU Ostrava, further the system is available for a commercial industrial utilization. By described methods and algorithms implementation to the system, there is arisen unique instrument for predictive diagnostic of monitored mechanical devices.
Keywords: embedded system, predictive diagnostic system, signal analysis, digital signal processing.

Nicolae Militaru, Marian Gabriel Banciu, Teodor Petrescu, George Lojewski - Microwave planar band-pass filters using defected ground microstrip structures **132**

Abstract: In this paper a study of some microwave microstrip band-pass filters using defected ground structures (DGS) is presented. It is shown that the presence of a slot in the ground plane can substantially enhance the electric coupling, or the electric part of a mixed coupling between two microwave resonators. This technique allows designs of tight couplings without the necessity of using very narrow coupling gaps. Based on the results of this study, a 4-pole cross-coupled planar microwave band-pass filter (BPF) with a slot in the ground plane was designed. Compared to a similar microstrip filter without defected ground, its simulated performances indicate some advantages.
Keywords: filter, cross-coupling, defected ground.

Mircea Băbăiţă, Viorel Popescu, Adrian Popovici, Petru Papazian - Modeling, Analysis and Simulation Results Regarding a Power Factor Correction Rectifier **136**

Abstract: This paper proposes a new control technique for single-phase boost power-factor-correction (PFC) rectifiers that improves the dynamic response of the converter to load steps without the need of a high crossover frequency of the voltage loop. So a low distortion of the input current is easily achieved. A 100W power-factor correction rectifier with the proposed control scheme has been designed, simulated and implemented, validating the concept.
Keywords: Power factor correction, average current control, rectifiers, power conversion.

Alexandru Lazar, Mihail Florea, Dimitrie Alexa, Luminita Camelia Lazar, Georgian Alexandru Lazar - New Control for Charge Pump Buck Converter **142**

Abstract: The paper proposes a new voltage control methodology for the "Charge Pump Buck Converter". During each commutation, the converter pumps a defined charge to the load circuit.

The original circuit was improved and is able to control the output current both through the switching frequency and through the amount of electrical charge which is delivered to the load during each commutation. The control through the charge is very efficient for low rates between output voltage and input voltage. The main equations that can be used for the converter's design are also presented in the paper.
Keywords: dc/dc power converter.

I. K. Bousserhane, A. Hazzab, M. Rahli, B. Mazari, M. Kamli - Direct Field-Oriented Control Based on Backstepping Strategy with Fuzzy Rotor Resistance Estimator for Induction Motor Speed Control **146**

Abstract: In this paper, the speed control of an induction motor using backstepping design with fuzzy rotor resistance estimation is proposed. First, the direct field oriented control IM is derived. Then, a backstepping for direct field oriented control is proposed to compensate the uncertainties which occur in the control. The effectiveness of the proposed control scheme is verified by numerical simulation. The numerical validation results of the proposed scheme have presented good performances compared to the conventional direct-field oriented control.

Andrei Câmpeanu, János Gal - OTA-C BIQUAD Cells Emulation of LC Ladder Filters **154**

Abstract: The paper presents a method to design continuos-time filter based on the node-voltage simulation of LC ladder structures. The node voltages are used as variables to generate transfer functions. The OTA-C biquad cells are realized in distributed-feedback configuration and use node current injection to permit multiple input action. Both all-pole and finitetransmission- zeros LC low-pass and high-pass filters are implemented. Applying standard low pass to bandpass frequency transformation to OTA-C circuits capacitors, bandpass and bandstop filters are easily obtained from their low-pass or high-pass active filters prototypes..
Keywords: filter synthesis, OTA-C biquads.

Mihaela Cîrlugea, Fazakas Albert, Sorin Hintea - Precisely Measuring Using Behavioural Blocks in PSpice **158**

Abstract: We created specialized behavioral blocks that compute fast and accurately the power, the rms and average values of a signal. The signals can be seen through an adjustable "examination window". The method was tested on some filters and illustrated on some DC-DC converters, where the switch period is of μseconds and it is hard to obtain accurate data. The signals can be seen through an adjustable window.
Keywords: behavioural blocks, VIP, VIMED.

Ciprian Dughir, Gabriel Găşpăresc - Preconditioning Circuit for Electrical Power System Disturbances Measurement **164**

Abstract: This paper is focused on how to reduce the amplitude of electrical disturbances which appears in the electrical power systems to a low voltage supported by the acquisition boards, without loosing any important disturbances. Is well known the fact that the maximum input voltage of the most popular acquisition boards is about ±10V. The disturbances may heave 10kV amplitude, and if we simply divide the input voltage by 1000 to reduce the 10kV to 10V, the main power system voltage (220V) will be reduced to 0.22V which is too low to obtain a sufficient accuracy in the measurement process, counting that the most of the disturbances have amplitudes in the area of 0-100V.
Keywords: power system, disturbance, voltage divisor, nonlinear.

Popo Rodion - Rejection of potentially defective CMOS IC **170**

Abstract: In this paper, some measures of increase of operational reliability of microcircuits at

stages of manufacture and operation are examined.
Keywords: *microcircuits.*

Cosmin Popa, Anca Manolescu, Anton Manolescu - Superior-Order Curvature-Corrected Voltage Reference with Improved Performance **174**

Abstract: A new curvature-correction technique for improving the temperature behavior of a CMOS voltagereference will be presented. The reducing of the temperature coefficient for the reference voltage will be realized compensating the nonlinear temperature dependence of the gate-source voltage for a MOS transistor working in weak inversion with the difference between two gate-source voltages. These MOS transistors are polarized at drain currents with different temperature dependencies (PTAT and $PTAT^{\alpha}$, respectively), α parameter being selected to the optimal value for the implementing technology. The PTAT voltage generator will be designed using an original Offset Voltage Follower block, with the advantage that matched resistors are replaced by matched transistors and, in consequence, with a relatively smaller degradation of the circuit temperature behavior caused by devices' mismatches. SPICE simulation reports TC=1. 95 K/ppm for an extended temperature range, 273K< T <363K, without considering the parameters spread.
Keywords: *Offset Voltage Follower block, sub-threshold operation, superior-order curvature-correction technique, temperature coefficient.*

Albert A. Fazakas, Mihaela Cârlugea, Lelia Feştilă - SVM Classifier using LUT-based RAM on a Spartan 3 FPGA **178**

Abstract: Support Vector Machines are widely used in pattern recognition, being the newest achievements in neural network structures. This paper presents an implementation example of an SVM classification function using a Spartan3 FPGA device. A Block Ram based implementation is compared versus a distributed LUT-based RAM one. Aspects regarding memory geometry and instantiation are presented. The number of required clock periods and the maximum clock frequency is calculated and a speed comparison of the implemented system with software running on a PC targeting the same application is also made.
Keywords: *Block RAM, LUT-based RAM, FPGA.*

Philipp Roebrock - TCP Identification of contactless measurement systems **184**

Abstract: This paper describes an algorithm to determine the robot tool transformation and tool center point (TCP) for contactless measurement systems. Valid types of sensors are those who provide metric information about one or multiple points within the sensors coordinate system. The reference objects are geometrical primitives (planes, spheres). The algorithm starts with estimated values for the tool transformation and the reference object definition and optimizes them in an iterative process. The optimisation result is tested for convergence with a simulation.
Keywords: *sensor, robot tool transformation, TCP, tool center point, optimisation, Jacobian matrix.*

Alioşa V. Hriţcu - The Mealy in Moore conversion of an automaton **188**

Abstract: This paper presents a new demonstration of the Mealy in Moore conversion theorem and a new matrix algorithm which, just manually, can be used for automatons with a great number of internal states. The Mealy in Moore conversion is a phase in the logical synthesis of a Mealy automaton using, for example, programmable logic arrays or relays.

Elena Doicaru – The Micropower Translinear Network Implementation of Rational Approximated Functions **191**

Abstract: In this paper are presented several translinear topologies suitable for static and dynamic analog signal processing at very low supply voltage. The one variable objective functions, firstly

are rational approximated, then are decomposed in continued fractions and finally implemented with CMOS translinear networks. Such implementation is preferred in application that required small errors of signal procesing.
Keywords: *analog signal processing circuits, translinear circuits, CMOS integrated circuits, low power and low voltage circuits.*

Popo Rodion - A New Approach to Higher Education. **197**
Abstract: *The traditional form of the maximum Russian higher education consists in a certain sequence of lecturing, carrying out practical and laboratory researches during a semester which comes to an end with offsets and examinations. This paper describes a few issues in the Russian higher education. It also proposes a solution to its crisis.*
Keywords: higher education.

Valentin-Ioan Maranescu, Cătălin D. Căleanu, Corneliu I. Toma - High input, wide output voltage range linear regulators **205**
Abstract: *This paper proposes a method to obtain a high input voltage stabilizer by connecting adjustable voltage regulators in series. Wide output voltage range, maintaining maximum current was obtained without secondary breakdown risks. A method to equal distribute the power dissipation on series regulators was proposed leading to an extended equivalent safe operating area.*
Keywords: voltage regulator, wide voltage range, safe operating area (SOA), thermal transfer.

Mircea Tomoroga, Lucian Jurca, Mircea Ciugudean - Current-Steering Digital-to-Analog Converter/Programmable Sub-Bandgap Voltage Reference with Split Input Code **209**
Abstract: In this paper we will offer a concrete solution of a DAC which will be used in high speed and medium resolution applications. This DAC presents an important innovation as the voltage reference does not represent a distinct block, but it overlaps the functional diagram of the converter. This was considered to be of current steering type with MOS transistors in standard CMOS technology like in most of the recent works. The new solution also implies the splitting in two equal parts of the digital input code applied to the converter. This will drastically diminish the number of large dimension transistors used in the current sources of the converter.
Keywords: *current-steering digital-to-analog converter, sub-bandgap voltage reference, split input code.*

Sandra Rugină, Georgiana Sârbu-Doagă, Aurel Gontean - Analysis and modeling of rain characteristics **215**
Abstract: Realistic modeling of rain characteristics is important in several domains, such as meteorology, agriculture and transportation. Rain generators need to have reproducible characteristics, while being able to simulate variability existing in natural rains. In the present work, several characteristics of natural rains were analyzed, then several working parameters of a rain generator were proposed and simulated.
Keywords: *rain generator, rain modeling, statistics.*

D. Alexa, T.Goras, R.Chiper, I.V.Pletea, I.Pletea, A. Alexandrescu1, A.Petrichei - Two – Quadrant Converter with RNSIC Analysis having Capacitors on the AC side **219**
Abstract: A new topology for a two – quadrant converter is presented. In the AC/DC transfer mode the converter works as a rectifier with near sinusoidal input currents (RNSIC), while in the DC/AC transfer mode it works as a square-wave pulse switching inverter. Some suggestions for the converter design are given and a comparison with two–quadrant PWM converter is made.
Keywords: *power quality, two-quadrant converter, square-wave pulse switching inverter.*

Corneliu I. Toma, Mihail E. Tănase - On the Precision in the Determination of the Movement Features by Doppler Radio–Telemetry **223**

Abstract: For determining the features of a movement at low speed in the atmosphere, the authors have proposed a Doppler radio-telemetry system with active fixed referential. This paper deals with the precision in the determination of the movement features at low speed in the atmosphere, using electromagnetic waves. The establishing of the systematic errors and the appreciating of the random errors, represents the authors' contribution in this paper.
Keywords: *Doppler signal, systematic errors, random errors.*

Petruț Duma, Luminița Scripcariu - Controlling a Hi-Fi Audio Amplifier on I2C Bus Using Microcontroller AT89S8252 ..... **229**

Abstract: The paper presents the hardware structure of a Hi-Fi audio amplifying chain consisting of a sound fader control circuit and a power amplifier, both digitally controlled by microcontroller AT89S825 on I2C bus. The authors have built in practice this application within the university's laboratory. The user is able to control the operation the audio amplifier using switches and a LCD. The command program that the authors wrote in assembly language, operates in real-time and presents the user with an interactive way to activate various features and to adjust the amplifier's parameters.
Keywords: *Hi-Fi audio amplifier, sound fader control circuit, ATMEL microcontroller, I^2C bus.*

Petruț Duma - Logic Analyzer for Development Systems Equipped with AT89C51 Family Microcontroller **235**

Abstract: The paper describes the hardware structure of the interface used by a logic analyzer for testing development systems equipped with AT89C51 family microcontroller. The interface is connected to a command and control unit equipped with I80C51 microcontroller and to a personal computer. The command program perform execution and testing functions for instructions run on a tested system, instruction display functions at instruction cycle, semi-cycle, state, phase and clock levels, initialisation function for the tested microcontroller, as well as other general purpose functions.
Keywords: *logic analyzer, development system, ATMEL microcontroller, command software.*

Scientific Bulletin of the "Politehnica" University of Timisoara
Transactions on Electronics and Telecommunications
Vol. 51 (65), No. 2, 2006, ISSN 1583-3380, Proceedings of the 7th International Symposium on Electronics and Telecommunications Etc 2006, Timişoara, Romania, 21-23 Sept. 2006
Contents

Liliana Stoica – *A New Algorithm for Determining the Coefficients in B-spline Interpolation* **…… 5**

Abstract – This algorithm is one of the methods that use spline functions for interpolation. In the context of general interpolation the coefficients are calculated using the values of the function and function's derivatives in the knots. Compared with another known algorithm, in this case is not necessary to perform the signal extension. But appear another problem: how to calculate the values for the derived function. Three methods are presented to resolve this. All the methods were applied for several input signals. From the practical results were made some conclusions.
Keywords: *interpolation, B-spline functions, divided differences.*

Doru Florin Chiper – *A New Linear Systolic Array for the VLSI Implementation of 2-D IDST* **……..…… 9**

Abstract - In this paper a new linear VLSI array architecture for the VLSI implementation of the 2-D IDST based on a new systolic array algorithm is proposed. This new design approach uses a new efficient VLSI algorithm. It employs a new formulation of the inverse DST that is mapped on a linear systolic array. Using the proposed systolic array high computing speed is obtained with a low I/O cost. The proposed architecture is characterized by a small number of I/O channels located at the two extreme ends of the array together with a low I/O bandwidth that is independent of the transform length N. The topology of the proposed VLSI architecture is highly modular and regular and uses only local connections. Thus, it is well suited for a VLSI implementation

Keywords: Inverse discrete sine transform, systolic algorithms, systolic architectures.

Ioana Adam, Marius Oltean, Mircea Bora – *A New Quasi Shift Invariant Non-Redundant Complex Wavelet Transform* **…….. 14**

Abstract – The property of shift-invariance associated with the property of good directional selectivity are important for the application of a wavelet transform in many fields of image processing. Unfortunately, the classical discrete wavelet transform is shift-variant. All modified algorithms proposed in the literature for the computation of a shift invariant transform are less or more redundant and difficult to implement, and consequently thorny to use in signal processing applications. In this paper, we propose a new, quasi shift-invariant wavelet transform, without redundancy and easy to implement.

R. M. Udrea, S. Ciochină, D. N. Vizireanu – *Acoustic Noise Reduction using an Improved Power Spectral Subtraction Method Based on Hartley Transform* **…..…… 19**

Abstract – We propose an improved spectral subtraction method for reducing acoustic noise added to speech in noisy environments like helicopter cockpit or car engine. Basic power spectral subtraction is modified using Discrete Hartley Transform to estimate cross-terms that are usually neglected. A large amount of memory storage and computational volume is saved using a real data transform. Experiments with speech affected by Gaussian and engine noise showed a better estimation of clean speech with the proposed method.

Keywords: speech enhancement, spectral subtraction.

Stefan Slavnicu, Silviu Ciochină – *Adapting a Normalized Gradient Subspace Algorithm to Real-Valued Data Model* **…….……. 23**

Abstract – A new gradient approach to adaptive subspace-based frequency estimation of multiple real valued sine waves is considered in this paper. The new approach proposed here combines the normalized gradient subspace tracking technique based on Oja learning rule - NOOja (for the signal subspace update) with the ESPRIT-like frequency estimation of realvalued sinusoids (for frequency values retrieval). Consequently, a new adaptive subspace-tracking algorithm for frequency estimation is proposed. The method proposed brings a significant reduction in arithmetical complexity at the same level of accuracy. The algorithm is tested in numerical simulations and compared to complex-valued NOja method.

Keywords: subspace tracking, frequency estimation, real-valued data, R-ESPRIT, NOja.

Spiridon Florin Beldianu – *Algorithms for Fast Full Nearest Neighbour Search on Unstructured Codebooks: A Comparative Study* **…….…… 28**

Abstract – This paper presents several fast nearest neighbor search algorithms for vector

quantization on unstructured codebooks of arbitrary size and vector dimension that uses linear projections and variance of a vector. Several new inequalities based on orthonormal Tchebichef moments and projections on the first vectors of the DCT and PCA transformations of an image block are introduced to reject those codewords that are impossible to be the nearest codevector and cannot be rejected by inequalities based on Hadamard Transform, sum and variance, thereby saving a great deal of computational time, while introducing no extra distortion compared to the conventional full search algorithm.
Keywords: *vector quantization, fast full nearest neighbor search, image vector quantization, linear projections.*

M. A. Ajo, G. Fericean, M. Borda, V. Rodellar – *An IP design of the idea cryptographic algorithm* ……..... **34**

Abstract – In this paper we introduce a library component implementation of the IDEA cryptographic algorithm that may be used embedded in security applications. The model allows scalability in the number of bits of the plaintext and ciphertext and in the number of keys. The hardware design has been modeled in VHDL portable code resulting in a technology independent soft-core.
Keywords: Reusability, IP core, IDEA algorithm, Cryptography.

P. Serafin, A. Ignea – *Application for Frequent Pattern Recognition in Telecommunication Alarm Logs* ….....….. **38**

Abstract – Based on an algorithm for frequent pattern recognition, this paper presents the implementation of a software application and its respective results in analyzing real-time telecommunication alarm logs. The software application was developed in OMNeT++ (Objective Modular Network Testbed in C++) simulation environment using ACE (Adaptive Communication Environment) toolkit. Different working scenarios are presented in order to simulate extensions of the frequent pattern recognition algorithm: the introduction of time-constraints between alarms and the construction of a Petri net whose transitions are labeled by recognized frequent patterns of alarms.
Keywords: pattern recognition, OMNeT++ simulation environment, ACE toolkit.

Liliana Stoica – *Contributions in Recursive Filtering for B-spline Interpolation in Signal Processing* ……..…….. **44**

Abstract –The problem of interpolation a set of data is an old one, but the demanding of flexibility and high speed in operating on-line and in real time processing need to find new methods and improve the old ones [1]. The main properties of B-spline functions offer the possibility to implement algorithms of interpolation in a faster and optimal manner. A function can be represented by B-spline functions with a set of coefficients. For interpolative signal reconstruction it is necessary to calculate those coefficients. In this paper, for cubic spline interpolation it is analyzed a known algorithm and some of his deficiencies. Also there are relieved some possibilities for developing new algorithms that could eliminate those problems. It is presented another way to determine the initial coefficients by using the polynomial representation on short intervals of the spline function and his derivatives. Based on this results are made several observations for further use in improving the algorithm.
Keywords: interpolation, B-spline functions.

Mircea-Radu Campean, Monica Borda – *Cryptographical System for Secure Client–Server Communication* **50**

Abstract - The aim of this paper was the research of a way to implement a cryptographical system

for secure Client-Server communication, designed to satisfy the specific needs of the health care domain. A real IP based Client-Server application was created, that assures confidential message transfer using standardized cryptographic algorithms and components. A particular PGP (Pretty Good Privacy) like architecture was designed to ensure the communication security. Low costs, along with an easy to use implementation, represent decisive advantages when trying to implement the system in the medical area, which has limited budget for informatization.
Keywords: Cryptography, Encryption, Decryption, Authentication, Confidentiality, Client-Server.

Andrei Maiorescu, Adriana Sîrbu, Ioan Cleju, Ion Bogdan – *Designing an Audio Application for Bluetooth Enabled Devices* **……..…… 54**

Abstract – Bluetooth wireless technology has opened a new perspective over the services available in personal area networks. Implementation of audio based profiles is a challenge taking in account the diversity of involved devices and circumstances. The paper focuses on the implementation issues concerning the establishment of an audio link between two devices with built in Bluetooth radio chips. The particularities imposed by the protocol specifications are commented. Finally the test application is presented.
Keywords: Bluetooth, audio application.

Radu O. Preda, Dragoş N. Vizireanu, Radu M. Udrea – *Digital Watermarking for Image Copyright Protection in the Wavelet Domain, robust against Geometric Attacks* **…….....…….. 58**

Abstract – This paper proposes a digital watermark embedding method based on a multiresolution wavelet decomposition. The robustness against geometric distortions is based on image normalization. The watermark embedding and extraction are carried out with respect to an image normalized to meet a set of predefined moment criteria. We embed the watermark into the higher level detail wavelet coefficients from different wavelet subbands with the use of a key. The resulting watermarking scheme can be used for public watermarking applications, where the original image is not available for watermark extraction.
Keywords: Digital watermarking, Copyright Protection, Discrete Wavelet Transform, geometric attacks, image normalization.

Marius Oltean, Victor Adafinoaiei – *ECG Signal Denoising in the Diversity Enhanced Wavelet Domain* **…….. 63**

Abstract – The paper presents a denoising algorithm using which is particularly suited to ECG signals. The main stage of this algorithm consists in a MAP filtering in wavelet domain. Its effectiveness relies on the diversity enhancement of the signal to be processed and on realistic a-priori assumptions regarding statistical properties of the wavelet coefficients. Tests made on a big number ECG signals, in realistic conditions, showed very promising results. The noise is removed, while the useful waveforms are preserved.
Keywords: denoising, wavelet, ECG, MAP.

János Gal, Andrei Campeanu, Ioan Nafornita – *Estimation of Noisy Sinusoids Instantaneous Frequency by Kalman Filtering* **…….....…….. 69**

Abstract – The paper addresses the problem of estimating the instantaneous frequency of discrete time sinusoids imbedded in Gaussian noise. The proposed method is based on a model of the signal phase as a polynomial. This approach offers the opportunity to represent these signals by an adequate state space model and to apply standard Kalman filtering procedures in view to estimate the parameters of the phase polynomial. Procedure simulations were made on linear chirp sinusoids and are consistent with the theoretical approach. The paper presents the most important

results.
Keywords: *instantaneous frequency, polynomial phase, chirp signal, Kalman filter.*

Rodica Stoian, Lucian Perişoară – *Evaluation of Information Capacity for a Class of MIMO Channels* **…..... 73**

Abstract - The Multiple Input Multiple Output (MIMO) Channels are usually used in wireless communications, by the use of spatial diversity at both sides of the link. The MIMO concept is more general and embraces many other scenarios such as wireline networks (LANs). This paper summarizes the state of art in MIMO channels, presenting MIMO channel models, summarizing the computing of the information capacity for some particular MIMO channels and making a comparative analysis for different channel modeling parameters.
Keywords: Information Theory, Wireless Networks, LANs, MIMO systems, multipath propagation, information capacity.

Daniela Fuiorea, Dan Pescaru , Vasile Gui, Corneliu I. Toma – *Feature based 2D image registration using mean shift parameter estimation* **…….. 77**

Abstract – A new method of feature based 2D image robust registration is proposed. The image distortion is modeled as a similarity transform with four parameters, estimated sequentially by 1D transforms, resulting in an increased sample density as compared to 4D space processing. By adopting a mean shift estimator, advantages of RANSAC and M-estimators can be combined within a single and sound theoretical framework. Experimental results confirm the validity of the proposed approach.
Keywords: image registration, robust estimation, mean shift, similarity transform.

Alina Nica, Alexandru Căruntu, Gavril Toderean, Ovidiu Buza – *Features Extraction from Romanian Vowels Using Matlab* **……..…… 81**

Abstract – In this paper we developed in MATLAB a software environment in order to extract the main features from the Romanian vowels, which we intend to use in the synthesis step. We estimated speech parameters such as: energy, zero crossing rate (ZCR), fundamental frequency, formants. The used methods for obtaining the parameters are time domain analysis, cepstral analysis and Linear Predictive Coding (LPC). The analyzed vowels were uttered by several speakers and some experimental results are presented.
Keywords: speech analysis, vowels, features extraction, cepstrum, LPC.

Romulus Terebes, Monica Borda, Ioan Nafornita – *Image filtering and enhancement using directional and anisotropic diffusion techniques* **…… 85**

Abstract – A novel diffusion filter for low-level image processing is proposed. Analyzing the drawbacks of Gaussian convolution based regularization of partial derivatives equations, we propose an alternate method that employs anisotropic diffusion techniques to presmooth an image. The new technique is developed within the framework of previously proposed directional diffusion processes. Through a statistical interpretation we prove that the new filter produces consistently better results than the original version, especially when dealing with oriented textures having different spatial frequencies. Application samples are also provided in the final part of the paper.
Keywords: diffusion, anisotropic, orientation.

Mircea-Florin Vaida, Valeriu Todica – *Image Processing Facilities for Echographic Measurements* **…….….... 91**

Abstract – The aim of the paper is to present a flexible dedicated application, HealthImag, able to

integrate different medical facilities. Representative quantitative parameters are used for echographic measurements. Important facilities concerning the preprocessing, specific quantitative parameter measurements, data visualization are considered for medical investigations.
Keywords: *HealthImag, echographic, fractal, texture.*

Constantin Paleologu, Călin Vlădeanu, Andrei A. Enescu – *Lattice MMSE Single User Receiver for Asynchronous DS-CDMA Systems* **……..……...97**

Abstract – This paper considers a lattice Minimum Mean-Squared Error (MMSE) single user adaptive receiver for the asynchronous Direct Sequence – Code Division Multiple Access (DS-CDMA) system. It is based on the Gradient Adaptive Lattice (GAL) algorithm. Since the lattice predictor orthogonalizes the input signals this algorithm achieves a faster convergence rate than the transversal counterpart, the Least Mean Square (LMS) adaptive algorithm, paying with an increased computational complexity. Superior performances are obtained by adapting the tap weights several times during each bit interval.
Keywords: *DS-CDMA, adaptive filter, GAL, LMS.*

Emanuel Puschita, Tudor Palade, Bogdan Pop, Sandu Florin – *Mobility Mechanisms for Mobile/Wireless all-IP Networks* **…….. 103**

Abstract – For the next generation technologies, mobility is more than a necessity, it's a requirement. Actual developed architectures dedicate a special attention to this aspect. Considering that, this paper analyzes the aspect reflecting the network capability, named mobility. We test and verify the mobile nodes availability to roam in different scenarios, for computer networks and cellular networks. All simulations scenarios were implemented using ns-2 network simulator and for the tested architectures we offer the end-to-end delay during the handover process. The results demonstrate how average end-to-end delay contributes to the QoS global evaluation for a wireless scenario.
Keywords: *mobility, QoS support, end-to-end delay, ns.*

Rodica Stoian, Adrian Raileanu – *How to Choose a Model for Ad hoc Wireless Networks* **…….. 109**

Abstract – This paper studies ad hoc wireless networks using a network information theory point of view. Two classes of networks are analyzed in the paper, considering the location of the nodes and the traffic graphs: arbitrary and random. Three theoretical models are presented for multi-hop transport, and each of them takes into account different aspects of these types of networks: protocol restrictions, interference, bandwidth. The minimal model parameters are inventoried, and their influence on the model behavior is discussed. New metrics are introduced, to allow a more accurate representation of the information flow in wireless networks. The current status and difficulties of the traditional information theory to describe this multiple input-output system are discussed. The third model that we introduce is an extension of the interference model, that adds a new parameter, bandwidth, and an optimum criteria using results from information theory of MIMO systems. The intention to bring together information theory and network protocols is the right way to analyze the limitations of the current implementations of such systems.
Keywords: *wireless networks, ad hoc networks, network information theory, network transport capacity, network model metrics.*

Horia Balta, Maria Kovaci, Alexandre de Baynast, Calin Vladeanu, Radu Lucaciu – *A Very General Family of Turbo-Codes: The Multi-Non-Binary Turbo-Codes* **…… 113**

Abstract – This paper presents a new family of turbo codes whose the constituent codes have $R \geq 1$ non-binary inputs and R+1 outputs. We refer this family as the multi input non-binary turbo codes

(MNBTC), which is very general. More specifically, we show that this family includes the multi-binary turbo-codes (MBTCs) that themselves include the classical binary turbo-codes (BTCs). Moreover, it also includes the turbo-codes with Reed Solomon codes as constituent codes. In this paper, we fully describe the encoding process and the extension of the Maximum A Posteriori (MAP) decoding algorithm, especially the trellis closing issues for these codes. Additionally, we show by simulations the benefit of using this family of Turbo-codes.
Keywords: turbo-code, MAP algorithm, multi nonbinary convolutional code.

Valeriu Munteanu, Daniela Tarniceriu – *On Semantic Feature of Information* **…… 119**

Abstract – Beside the objective or quantitative characteristic of a message, appraised by the probability with which it is supplied, its semantic or qualitative characteristic, appraised by a certain utility or importance is, additionally, considered. In this paper we determine the quantitative – qualitative information, the quantitative – qualitative entropy of a discrete, complete and memoryless source as well as the main properties of the quantitative – qualitative entropy.
Keywords: semantic sources, entropies.

Abdourrahmane M. Atto, Dominique Pastor, Alexandru Isar – *On the Asymptotic Decorrelation of the Wavelet Packet Coefficients of a Wide-Sense Stationary Random Process* **……..... 123**

Abstract – Consider the wavelet packet coefficients issued from the decomposition of a random process stationary in the widesense. We address the asymptotic behaviour of the autocorrelation of these wavelet packet coefficients. In a first step, we explain why this analysis is more intricate than that already achieved by several authors in the case of the standard discrete orthonormal wavelet decomposition. In a second step, it is shown that the autocorrelation of the wavelet packet coefficients can be rendered arbitrarily small provided that both the decomposition level and the regularity of the quadrature mirror filters are large enough.

Adrian Paun, Serban Obreja – *On The Mmse Iterative Equalization For TDMA Packet Systems* **……..... 129**

Abstract – Original turbo equalization using a trellis-based channel equalizer and channel decoder improves significantly the bit error rate performance. However, a large alphabet modulation employed in the systems with multipath channels requires an excessive high number of states in such equalizer, so the optimal maximum a posteriori probability (MAP) becomes prohibitively complex. Therefore, sub-optimum equalizers with a priori information from the channel decoder have to be considered in order to enhance its performance. In this paper we investigate the performances of minimum mean square error (MMSE) filter based iterative equalization for the Enhanced General Packet Radio Service (EGPRS) radio link. The simulation results demonstrate that MMSE turbo equalization constitutes an attractive candidate for single-carrier wireless transmissions with multilevel modulation, in long delay-spread environments.
Keywords: turbo equalization, MMSE filter, TDMA systems.

Ondrej Krejcar – *Benefits of building information system with wireless connected mobile device - PDPT Framework* **…….. 135**

Abstract – The proliferation of mobile computing devices and local-area wireless networks has fostered a growing interest in location-aware systems and services. Additionally, the ability to let a mobile device determine its location in an indoor environment at a fine-grained level supports the creation of a new range of mobile control system applications. Main area of interest is in model of radio-frequency (RF) based system enhancement for locating and tracking users of our control system inside buildings. The framework described here joins the concepts of location and user

tracking in an extended existing control system. The experimental framework prototype uses a WiFi network infrastructure to let a mobile device determine its indoor position as well as to deliver IP connectivity. User location is used to data pre-buffering and pushing information from server to user's PDA. Experiments show that location determination can be realized with a room level granularity.

Maria Kovaci, Alexandre de Baynast, Horia G. Balta, Miranda M. Nafornita – *Performance of Multi Binary Turbo-Codes on Nakagami Flat Fading Channels* **… 140**

Abstract – In this paper, performance in terms of Bit Error Rate (BER) and Frame Error Rate (FER) of multibinary turbo codes (MBTC) over Nakagami frequency nonselective fading channels are presented. The proposed MBTCs consist of the parallel concatenation of two identical 2/3-rate recursive systematic, convolutional (RSC) double binary codes. We choose to model the channel fading with Nakagami-m distribution since it fits well to the empirical fading data of the current wireless transmission systems. The simulation results show that the MBTCs outperform the classical turbo codes for low-targeted FER (around 10e-4) since their error-floor is negligible.
Keywords: multi binary turbo code, flat fading channel, Nakagami distribution.

Corina Nafornita, Alexandru Isar, Monica Borda – *Pixel-wise masking for watermarking using local standard deviation and wavelet compression* **…… 146**

Abstract – Perceptual watermarking in the wavelet domain has been proposed for a blind spread spectrum technique, taking into account the noise sensitivity, texture and the luminance content of all the image subbands. In this paper, we propose a modified perceptual mask, where the texture content is appreciated with the aid of the local standard deviation of the original image, which is further compressed in the wavelet domain. The effectiveness of the new perceptual mask is appreciated by comparison with the old watermarking system.
Keywords: image watermarking, discrete wavelet transform, wavelet statistical analysis, perceptual watermark.

Zdenek Slanina, Vilem Srovnal – *Real-Time Process Monitoring in Operating System Linux* **…….....……. 152**

Abstract – The article deals with a design of system module for the selected processes monitoring in the operating system RT-Linux. The designed module will be able to observe states of selected processes in realtime (start, stop, interruption ...) and visualize changes of states on the remote Linux system. For the better explanation of problems are given basic characteristics of operating systems Linux and RT-Linux. There are described the initiate problems solution, process states monitoring and time sequence of task processing in real time.
Keywords: Linux, RT-Linux, process, scheduling, monitoring, embedded systems, real-time systems.

Marcel Gabrea – *Single Microphone Noise Canceller Based on a Robust Adaptive Kalman Filter* **…….... 158**

Abstract – This paper deals with the problem of speech enhancement when a corrupted speech signal with an additive noise is the only information available for processing. Kalman filtering is known as an effective speech enhancement technique in which speech signal is usually modeled as autoregressive (AR) process and represented in the state-space domain. In the above context, all the Kalman filter-based approaches proposed in the past operate in two steps: they first estimate the noise and the driving variances and parameters of the signal model, then estimate the speech signal. This paper presents an alternative solution that does not require the explicit estimation of noise and driving process variances. This deals with a new formulation of the steady-state Kalman

filter gain estimation based on the use of external description of systems. Unlike the conventional approaches, no suboptimal Kalman filter is needed here.
Keywords: *speech enhancement, Kalman filtering, noise reduction.*

Mihai Vlad, Ionut Sandu, Virgil Dobrota, Ionut Trestian, Jordi Domingo-Pascual – *Software Tool for Passive Real-Time Measurement of QoS Parameters* **…….…… 163**

Abstract – The paper presents the designing of a software tool for real-time measurement of the following quality of service parameters: one-way delay, average one-way delay, IP packet delay variation and average IP packet delay variation. The solution is an improved version of OreNETa (One-way delay REaltime NETwork Analyzer), by optimizing the traffic between the meter and the analyzer. When a new flow is detected, the meter assemblies a flow descriptor and sends it to the analyzer. Following the flow recording, it will announce the meter to send a shorter message, called header, for all the packets belonging to the newly registered flow.
Keywords: *measurement tool, OreNETa, QoS parameters.*

Valeriu Munteanu, Daniela Tarniceriu – *Some Properties of Semantic Sources* **…… 169**

Abstract – In this paper we derive the quantitative –qualitative entropy an extension of order m of a semantic source, as well as the semantic entropy of discrete ergodic sources with memory. The Kraft inequality and Shannon's first theorem are generalized for these sources. Some applications of semantic sources are also presented.
Keywords: *semantic sources, entropies, Kraft's inequality, Shannon's first theorem.*

Şerban Mereuţă – *Spectral analysis for detecting protein coding regions based on a new numerical representation of DNA* **……..…… 173**

Abstract – The major signal in coding regions of genomic sequences has a three-base periodicity. By proposing a new numerical representation for the DNA chain, our aim is to use spectral analysis for recognizing the coding regions of a gene. Since the peak at f=1/3 in the Fourier spectrum is a good discriminator of the coding potential of an intronless DNA strand, we utilized this feature within a sliding window in order to detect probable exons in a DNA sequence. Our technique is independent of training sets or existing database information, and thus can find general application.
Keywords: *genomic signal processing, spectral analysis, exon detection.*

Eugen Lupu, Petre G. Pop, Radu Arsinte – *Speech and Speaker Recognition Application on the TMS320C541 board* **……..…... 177**

Abstract – The paper presents a speech and speaker recognition application developed on the EVM C541 board using the CCS®. The application represents the implementation of the TESPAR coding method on a DSP support. The TESPAR alphabet for the coding process was obtained formerly. The speech/speaker information contained in the utterances is extracted by TESPAR coder and provides the TESPAR A matrices. For the recognition decision, the distances among the TESPAR A test matrix and the TESPAR A reference matrices are computed. The results of the experiments prove the high capabilities of the TESPAR method in the classification tasks.

Radu Arsinte, Eugen Lupu – *Streaming Multimedia Information Using the Features of the DVB-S Card* **…..... 181**

Abstract – This paper presents a study of audio-video streaming using the additional possibilities of a DVB-S card. The board used for experiments (Technisat SkyStar 2) is one of the most frequently used cards for this purpose. Using the main blocks of the board's software support it is possible the implement a really useful and full functional system for audio-video streaming. The

streaming is possible to be implemented either for decoded MPEG stream or for transport stream. In this last case it is possible to view not only a program, but any program from the same multiplex. This allows us to implement a full functional system useful for educational purposes.
Keywords: *Multimedia, DVB-S, Networking.*

Bogdan Orza, Aurel Vlaicu, Adrian Chioreanu, Vlad Mihalcea, Laura Grindei – *Telemedicine Application for Distant Management of Oro-maxilo-facial Tumors* **… 185**

Abstract – TeleOralTum software is intended to collect on one server specific data from departments that work on the facial cancer diagnosis. Classical medical services imply the existence of a direct link between medical staff in different departments and the patient. Telemedicine is an old concept, which arise debates for more then 30 years. The application that we developed proves the need for a diagnose and management system that will allow a rapid gathering of data, a rapid elaboration of the diagnose, but also elaboration of reports and estimates that are so much needed in this field of medical research. The application works on a three layer distributed architecture, thus taking advantage of a high security for the patient data, easiness in splitting the work among software development teams, and also the easiness in which other medical departments can be added to the application. The user administration section is used to divide the accessibility domain for different types of client users. The architecture of TeleOralTum is an innovative one and has at its origin open-software tools.
Keywords: *telemedicine, medical management, Hibernet, telediagnosis.*

Cornel Ioana, Cédric Cornu, François Léonard, Arnaud Jarrot, André Quinquis – *The concept of time-frequency-phase analysis* **……. 189**

Abstract – The time-frequency representations constitute the main tool for analysis of non-stationary signals arising in real-life systems. There is a huge number of time-frequency approaches adapted for a wide class of signals. The common drawback is that these methods use only a part of instantaneous phase information. In this paper, we propose a new concept that takes advantage on time, frequency and phase characteristics of the signal. The extraction of time frequency-phase characteristic are done in two steps: conventional time-frequency analysis and phase continuity analysis. The results will prove the efficiency of this concept in the case of two digital modulation types : FSK and PSK.

M. Salagean, I. Nafornita – *The estimation of the instantaneous frequency using time-frequency methods*…..... **195**

Abstract – Instantaneous frequency (IF) is a very important parameter in a large number of applications. Generally, the IF is a non-linear function of time. For such cases the analysis of time-frequency content provides an efficient solution. In this paper is analyzed the performance in IF estimation of the two time frequency based methods. The first estimation method uses the complex argument distribution (CTD) and the second one uses the ridges extraction method from the time-frequency distribution based on mathematical morphology operators (TF-MO). Monocomponent signals with non-linear and highly non-linear IF corrupted by Gaussian white noise are considered as numerical examples.
Keywords: *Instantaneous frequency, time-frequency distribution, complex argument, mathematical morphology, signal analysis, image analysis.*

Horia Balta, Catherine Douillard, Maria Kovaci – *The Minimum Likelihood APP Based Early Stopping Criterion for Multi-Binary Turbo Codes* **…… 199**

Abstract – This paper presents a simple and efficient criterion for stopping the iteration process in multibinary symbol turbo-decoding with a negligible degradation of the error performance. The

criterion is devised starting to minimum log-likelihood ratio (LLR) based stopping criterion used for binary turbo codes (BTC). Two variants consist in particularizations of the same idea in the MAP and MaxLogMAP decoding algorithm cases. The proposed two variants criterion has efficiency close to the optimum (genie) criterion and is simple to perform.
Keywords: Iterative decoding, stopping criterion, multibinary turbo codes.

Alexandru Căruntu, Gavril Toderean, Alina Nica – VoiceStudio: *A HMM-based Tool for Research and Teaching in the Speech Recognition Field* **…….. 204**

Abstract – This paper introduces the Romanian speech recognition system VoiceStudio. As most state-of-the-art Automatic Speech Recognition (ASR) systems today, it is based on Hidden Markov Models. Although there are numerous toolkits designed for this task, they usually have no visual interface, which means that the student or the researcher needs to spend some considerably amount of time in order to learn their functionality. The system's modular design, together with some implementation issues are pointed out, as well as the future plans of development.
Keywords: speech recognition, Hidden Markov Models, visual interface.

Mihai Constantinescu, Doina Cernăianu, Dragoş Mischievici, Victor Croitoru – *Widespread Deployment of Voice over IP and Security Considerations* **.....……..... 208**

Abstract – During the last years, Internet facilities like email, the world-wide-web (WWW), and e-commerce have generated a boost of Internet growth, making offering services possible in fundamentally new ways. One of these services is Voice over IP (VoIP), also named Internet Telephony (IP telephony). With most major telecommunications carriers preparing for VoIP mass deployment, the security of service cannot remain a second priority anymore. This paper analyzes the main aspects of VoIP wide deployment and highlights the benefits of using a new security concept, Session Border Controller (SBC), in solving VoIP security issues.
Keywords: VoIP, SIP, DoS, Firewall, SBC.

6.3 Student Research Activities

The following graduation projects and dissertation essays received maximum qualification:

Graduation projects

1. Mihai Drăgan, *Image registration for multiscale machine vision*, Diploma advisor Prof. dr. eng. Ivan Bogdanov.

2. Radu Mârşu, *Hardware volume rendering of computer tomography data*, Diploma advisor Prof. dr. eng. Ivan Bogdanov.

3. Florin Cania, *GSM meteo station*, Diploma advisor Prof. dr. eng. Aurel Gontean.

4. Ovidiu Perța, *Modelling of automotive embedded software with application in RF transmitters*, Diploma advisor Prof. dr. eng. Aurel Gontean.

5. Simona Petroescu, *A FPGA controlled robot platform for VHDL education*, Diploma advisor Assoc prof. dr. eng. Mircea Dreucean.

6. Mihai Basch, *Design of a fast synchronous comparator in advanced CMOS technology*, Diploma Advisor Prof. dr. eng. Mircea Ciugudean.

7. Claudiu BRÂNZAN, *Signal Analysis using Hilbert-Huang Transform*, Prof. dr. eng. Liviu Toma.

Dissertation Essays

1. Radu Bugle, *GPS Supervision System*, Diploma Advisor Prof. dr. eng. Virgil Tiponuț.

2. Marius Cotoară, *Uninterruptable Power Supply with High Fiability*, Diploma Advisor Prof. dr. eng. Viorel Popescu.

3. Florin Popa, *Signal Acquisition System with Card ME 270,* Diploma Advisor Prof. dr. eng. Sabin Ionel.

4. Bianca Bagiu, *Skill Based Inspection and Assembly for Reconfigurable Automation Systems, ,* Diploma Advisor Prof. dr. eng. Ivan Bogdanov.

5. Andrei Racoțea, *Ontologies for Robots and Devices,* Diploma Advisor Prof. dr. eng. Ivan Bogdanov.

6. Liviu BERCEANU, *Feedback Loop of Switch Mode Power Supplies*, Diploma Advisor Prof. dr. eng. Aurel GONTEAN.

7. Tiberiu GÖRBE, *Automated Validation of a Switch Mode Power Supply using LabVIEW,* Diploma Advisor Prof. dr. eng. Aurel GONTEAN.

8. Alina DEAC, *Closed Loop Control of a Regulation System using a Stepper Motor and Position Sensor using TestSTAND/LabVIEW,* Diploma Advisor Assoc. Prof.dr. eng. Mihaela LASCU.

9. Monica MEDA, *Biomedical Image Processing,* Diploma Advisor Assoc. Prof.dr. eng. Mihaela LASCU.

10. Adrian HAREA, *Automatic Test Procedures at Siemens VDO Timişoara with the Relay Box,* Diploma Advisor Prof.dr.eng. Traian JURCA.

11. Andrei PAŞCA, *Special Problems in Distributed Clock Networks*, Diploma Advisor Prof. dr. eng. Aurel GONTEAN.

Two students, advised by Prof. dr. eng. Alimpie Ignea, were awarded Ericsson prizes for excellence in telecommunications:

- Sorin Nemet, for *Radio-frequency digital wattmeter*, was awarded a Honorary Recommendation and 500 EURO;

➢ Andrei Pasca, for *Variable gain dynamics compressor*, was awarded an honorary recommendation, 1000 EURO, and has been invited for a visit at Ericsson headquarters in Sweden.

6.4 Social life

Our students have free access to the Central Library of "Politehnica" University and to the library of Electronics and Telecommunications Faculty. They can also consult each Department's Library.

The Central Library contains over 600,000 volumes and offers subscriptions to 2,800 technical publications.

We publish the Scientific Journal of "Politehnica" University of Timisoara, being in charge with "Transactions on Electrical Engineering, Electronics and Communication".

Our University and also the Library are connected to the Internet:

- **http://www.upt.ro** = The University Web site,
- **http://www.library.upt.ro** = The Library Web site.

The students can get accommodation in a student hostel under certain conditions. This accommodation consists of:

- one room apartments,
- 4 place rooms including bathrooms,
- 2 place rooms.

Our students have various offers of recreation, health and welfare such as:

- The Students' House with several departments for different activities, artistic groups and writers' club.
- The "Politehnica" Sport Association which always reached high sports performance.
- Two sports arenas with: tennis courts, basketball, football, handball grounds, gymhall, nautical and horse racing bases.
- Medical assistance provided in consistent number of consulting rooms.

In our town there are also several social and cultural institutions namely:

- The National Theatre with three sections: Romanian, German and Hungarian,
- The Opera House,
- The Philharmonic Orchestra.

For further information consult http://www.romaniatourism.com/timisoara.html