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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 Timișoara with special focus on the year 2010. Information about the structure of the faculty, its position in the "Politehnica" University, and data concerning educational and research activities are presented.

Information that is more detailed can be obtained at the faculty and department secretariates.

You can also find relevant information visiting our website:

<http://www.etc.upt.ro>

The "Politehnica" University of Timișoara was founded in 1920, with the purpose of serving the technical education and research needs in western Romania. It is a public university and consists of ten faculties.

The late Prof. Remus Răduleț, member of the Romanian Academy, introduced the study of **Electronics** at the "Politehnica" University of Timișoara in 1931. In 1970, the specialization on "*Electronics and Telecommunications*" was established within the Faculty of Electrical Engineering, and four years later, in 1974, a new department, "*Electronics, Automation and Measurements*" was founded. In 1976, the Faculty of Electrical Engineering moved its headquarters to the present building where the number of laboratories and other facilities increased substantially.

The former specialization "*Electronics and Telecommunications*" became the "*Faculty of Electronics and Telecommunications*" in 1990. Starting with the following year, a short-cycle higher education programme (College level) has been created, but its activity ended in 2007.

The *Master* degree programme was introduced in 1994.

Our Faculty provides training for engineers in Electronics and Telecommunications in two areas of specialization: *Applied Electronics* and *Telecommunications*. The College provided specialized training in the fields of *Electronics*, *Communications* and *Mailing Services* as well as in *Audio-Video* and *Multimedia Technologies*.

The teaching activities are organized on three levels of study:

- graduate programmes: "Diploma (Licensed) Engineer" in Romanian and English;
- postgraduate degree programmes: "Master"
- Doctoral studies leading to a "Doctor of Philosophy" degree (Ph.D.).

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The graduate education level is organized in a 4-year period of studies. Students graduating from this educational form obtain the “Diploma (Licensed) Engineer” degree.

The Master degree programme consists of a 2-year programme of studies while the 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.

Teaching and learning are based on modern methods, especially with respect to practical activities. Special attention is paid to applied computer studies.

The teaching staff is organized in several teams and devotes a considerable amount of time to research programmes 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. ing. Marius OTEȘTEANU
- Vice Dean: Prof. dr. ing. Dan LASCU
- Vice Dean: Prof. dr. ing. Aurel GONTEAN
- Scientific Secretary: Prof. dr. ing. Florin ALEXA

Faculty address:

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Secretariate: Chief Secretary Cecilia MOISE, secretariat@etc.upt.ro
Laura MIRICĂ, Minerva POPA, Anca TURTĂ

Secretariate of the Applied Electronics (AE) Department:

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Secretariate of Communications (COM) Department:

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- phone: +40-(0)256-403301;

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

- room B301,
- phone: +40-(0)256-403361.

Faculty Council:

1. Prof. dr. ing. Ivan BOGDANOV, Head of Department AE
2. Prof. dr. ing. Aurel GONTEAN, Vice Dean
3. Prof. dr. ing. Vasile GUI, Head of Department COM
4. Prof. dr. ing. Alimpie IGNEA
5. Prof. dr. ing. Alexandru ISAR
6. Prof. dr. ing. Dan LASCU, Vice Dean
7. Prof. dr. ing. Ioan NAFORNIȚĂ
8. Prof. dr. ing. Marius OTEȘTEANU, Dean
9. Prof. dr. ing. Viorel POPESCU
10. Prof. dr. ing. Dan STOICIU, Head of Department MOE
11. Prof.dr.ing. Traian JURCA
12. Prof. dr. ing. Aldo De SABATA
13. Prof. dr. ing. Radu VASIU
14. Prof. dr. ing. Florin ALEXA, Scientific Secretary
15. Conf. dr. ing. Georgeta BUDURA
16. Conf. dr. ing. Cătălin CĂLEANU
17. Conf. dr. ing. Ioan LIE
18. Conf. dr. ing. Eugen MÂRZA
19. Andrei TERNAUCIUC, Ph.D student
20. George CHILOM, student IV TST, until October 2010
21. Alexandra IERNILA student II, from October 2010
22. Oana VOICHITOIU, student II, until October 2010
23. Iuliana DRAGOMIR, student II, from October 2010
24. Ecaterina CERVENCA, student IV TST
25. Raul NAGY, student III TST
26. Cristina COMAN, an I Master, until October 2010

2.1. Applied Electronics Department

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- Prof. dr. ing. Dorina ISAR
- Conf. dr. ing. Cătălin CĂLEANU
- Prof. dr. ing. Dan LASCU
- As. ing. Mircea BĂBĂIȚĂ

Staff

- Prof. dr. ing. Ivan BOGDANOV: Industrial Robots, Computer Control of Electrical Drives;
- Prof. cons. dr. ing. Mircea CIUGUDEAN: Conception of Analog Integrated Circuits and their Applications;
- Prof. dr. ing. Aurel GONTEAN: Programmable Logic Systems. Digital Circuits;
- Prof. dr. ing. Sabin IONEL: DSP Applications. Statistical Signal Processing. Failure Diagnosis;
- Prof. dr. ing. Dorina ISAR: Industrial Process Control Equipment. Signal Processing for Signal/Noise Ratio Enhancement;
- Prof. dr. ing. Dan LASCU: High Frequency Power Processors. Power Factor Correction Circuits. Modelling and CAD in Power Electronics;
- Prof. cons. dr. ing. Tiberiu MUREȘAN: Digital Circuits. Industrial Robot Driving. Switched Mode Power Supplies;
- Prof. dr. ing. Viorel POPESCU: Power Electronics, Switched Mode Power Supplies;
- Prof. cons. dr. ing. Mihail Eugen TĂNASE: Doppler Telemetry;
- Prof. dr. ing. Virgil TIPONUȚ: Analog Electronic Circuits. Programmable Logic Systems. Sensors and Transducers. Neural Networks;
- Conf. dr. ing. Dan ANDREICIUC: Industrial Robots. Mobile Robots;
- Conf. dr. ing. Cătălin CĂLEANU: Electronic Devices and Circuits;
- Conf. dr. ing. Ioan JIVEȚ: Design of ASIC (VLSI) Circuits. Design of Digital Systems with Microcontrollers and Microprocessors. Clinical applications of Electrical Bio-impedance. Tomography;
- Conf. dr. ing. Ioan LIE: Electronics. Doppler Telemetry;
- Conf. dr. ing. Adrian POPOVICI: Industrial Electronics. Materials for Electronics;
- S.I. dr. ing. Lucian JURCA: Analog Electronic Circuits;

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- S.I. dr. ing. Marius RANGU: Electronic Technology. Electronic Equipment Testing, PCB;
- S.I. dr. ing. Valentin MARANESCU: Conception of Analog Integrated Circuits;
- Conf. dr. ing. Dan NEGOIȚESCU: Industrial Electronics. Power Factor Correction Circuits;
- As. dr.ing. Mircea BĂBĂIȚĂ: Digital Circuits. Electrical Drives;
- As.dr.ing. Marllene DĂNEȚI: DSP Applications. Statistical Signal Processing. Failure Diagnosis. Multimedia;
- As. dr.ing. Benjamin DRĂGOI: Conception of Analog Integrated Circuits.
- As. ing. Aurel FILIP: Analog Electronic Circuits;
- As. ing. Petru PAPAȘIAN: Digital Circuits;
- As. ing. Sorin POPESCU: Analog Electronic Circuits. Programmable Logic Systems;
- As. ing. Bogdan MARINCA: Doppler Telemetry;

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

2.2. Communications Department

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Department board:

- Prof. dr. ing. Vasile GUI - Head of Department
- Prof. dr. ing. Ioan NAFORNIȚĂ
- Prof. dr. ing. Alexandru ISAR
- Conf. dr. ing. Georgeta BUDURA
- Conf. dr. ing. Eugen MĂRZA

Staff

- Prof. dr. ing. Andrei CĂMPEANU: Telecommunications Equipment Technology. Telecommunications Circuits;
 - Prof. dr. ing. Vasile GUI: Image Processing. Electronic Circuits and Devices;
 - Prof. dr. ing. Alexandru ISAR: Signals, Circuits and Systems. Applications of Wavelets Theory. Time-Frequency Representations. Compression. Coding;
 - Prof. dr. ing. Ioan NAFORNIȚĂ: Signals, Circuits and Systems. Adaptive Signal Processing. Time-Frequency Representations. Applications of Wavelets Theory. Microwaves;
 - Prof. dr. ing. Miranda NAFORNIȚĂ: Theory of Information and Coding. Data Transmission. Signals, Circuits and Systems. Modern Communications Networks;
-

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- Prof. dr. ing. Marius OTEȘTEANU: Television. Telephone Transmission Systems. Information Recording Techniques;
- Prof. dr. ing. Corneliu TOMA: Television. Analog Electronics. Image Compression. Motion Analysis. Pattern Recognition. Multimedia Technologies;
- Prof. dr. ing. Radu VASIU: Telecommunications Equipment Testing. Television and Digital Television. Multimedia Applications Development;
- Prof. dr. ing. Florin ALEXA: Television. Sound Techniques. Radiocommunications. Multimedia;
- Conf. dr. ing. Corina BOTOCA: Microwaves. Signals, Circuits and Systems. Neural Networks;
- Conf. dr. ing. Georgeta BUDURA: Signals, Circuits and Systems. Nonlinear Signal Processing. Telecommunication Circuits;
- Conf. dr. ing. Eugen MARZA: Radiocommunications. Mobile Radio. Radio Systems Engineering;
- S.I. dr. ing. Cornel BALINT: Switching Systems for Telecommunications;
- S.I. dr. ing. Muguraș MOCOFAN: Machine Vision and Pattern Recognition. Multimedia. Studio Equipment. Video Production;
- S.I. dr. ing. Horia BALTĂ: Optical Transmission and Processing of Information. Statistical Theory of Information Transmission. Theory of Information and Coding;
- S.I. dr. ing. Constantin M. BUCOS: Multimedia. Studio Equipment. Video Production;
- S.I. dr. ing. Corina NAFORNITA: Digital Signal Processing. Digital Watermarking;
- S.I. dr. ing. Nicolae MICLĂU: Optical Transmission and Processing of Information. Theory of Information and Coding;
- As. ing. Janos GAL: Signals, Circuits and Systems. Telecommunications Circuits;
- As. dr. ing. Maria KOVACI: Statistical Theory of Information Transmission. Theory of Information and Coding. Signals Circuits and Systems;
- As. ing. Radu LUCACIU: Optical Transmission and Processing of Information;
- As. dr. ing. Ciprian DAVID: Image Processing, Audio and Video Systems;
- As. ing. Marius OLTEAN: Data Transmission on Radio Channels;
- As. ing. Mihai ONIȚA: Television. Audio and Video Compression. Streaming. Multimedia;
- As. ing. Marius SALAGEAN: Signals, Circuits and Systems;
- As. ing. Călin SIMU: Biomedical Electronics. Radiocommunications;
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2.3. Measurements and Optical Electronics Department

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- Prof.dr.ing. Aldo DESABATA
- Prof. dr. ing. Traian JURCA

Staff

- Prof. dr. ing. Aldo De SABATA: Adaptive Methods in Measurement. Signal Processing. Microwaves;
- Prof. dr. ing. Alimpie IGNEA: Electrical and Electronic Measurements. Electronic Measurements, Sensors and Transducers. Electromagnetic Compatibility. Antenna Calibration;
- Prof. dr. ing. Traian JURCA: Electronic Measuring Instruments. Precision Instrumentation. Programmable Measuring Systems;
- Prof. dr. ing. Dan STOICIU: Electronic Measuring Instruments. Metrology, Quality and Reliability, Electronic Measurements, Sensors and Transducers. General Theory of Measurement;
- Conf. dr. ing. Mihaela LASCU: Measurement of Electrical and Non Electrical Quantities. Sensors and Transducers. Virtual Instrumentation;
- Conf. dr. ing. Daniel BELEGA: Electromagnetic Compatibility. Analog Integrated Circuits. Digital Processing Systems;
- Conf. dr. ing. Septimiu MISCHIE: Electrical and Electronic Measurements. Programmable Measuring Systems. Precision Instrumentation;
- S.I. dr. ing. Adrian VÂRTOSU: Microwaves. Microwaves and Optoelectronics Measurements. Television Channels Broadcasted Via Satellite;
- S.I. dr. ing. Robert PASZITKA: Microprocessor Systems Architecture;
- As. dr. ing. Raul IONEL:
- As. ing. Ciprian DUGHIR: Electromagnetic Compatibility. Antenna Calibration;
- As. ing. Liliana MÂTIU: Electromagnetic Compatibility. Digital Processing Systems. Electronic Measuring Instruments;
- As. ing. Cora IFTODE, Electromagnetic Compatibility, Digital Processing Systems, Electronic Measuring Instruments;
- As. ing. Adrian MIHĂIUȚI, Antenna Calibration. Electromagnetic Compatibility. Digital Processing Systems;

Other employees: two technicians, one secretary.

3. Educational activity

The Faculty of Electronics and Telecommunications provides education in electronic engineering, particularly in the areas of general and industrial electronics, telecommunications and measurement. The Faculty offers three educational programmes:

- A four-year programme. To obtain the degree of Diploma (Licensed) Engineer at the end of the four-year period of study, a student must pass the Licence written examination and the oral defence of the graduation thesis. Starting with the Academic year 2006/2007, the four-year graduate programme is also delivered in English.
- A two-year programme of Master Degree. A successful oral examination, which is a defence of the dissertation leads to graduation and the award of the Master degree.
- Doctoral studies programme leads to the Doctor Engineer degree.

Education is organized according to the transferable credits system (ECTS).

In agreement with the Bologna Declaration, The License-Master-Doctorate (LMD) system has been introduced in 2005.

3.1. The “Diploma (Licensed) 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 introduce them to the most recently developed techniques and devices in the design of electronic equipment;
- to habituate students with permanent intellectual work;
- to accustom students to information and computer technology with the purpose of enabling them to use Computer Aided Design;
- to supply 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, so as to prepare them for the mobility programmes promoted by the European Community and to foster their participation in international cooperation and research programmes;
- to provide students with knowledge in humanities for professional inter-communication skills.

Admission Requirements and Student Performance Standards

Entry requirements

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

Details of admission 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, with a weight of 20%. The actual entrance minimum score may vary according to the number and level of the candidates. The table below presents the enrolment statistics over the last 3 years.

Academic Year	Number of candidates	Number of admitted candidates	Minimum entry score
2006/2007	356 for publicly funded places	295 publicly funded (67 in English) 44 self funded (5 in English)	6.437/10 5.271/10
2007/2008	385 for publicly funded places	302 publicly funded (32 in English) 38 self funded (6 in English)	6.896/10 5.174/10
2008/2009	257 for publicly funded places	257 publicly funded (36 in English)	5.070/10
2009/2010	265 for publicly funded places	255 publicly funded (32 in English)	5.010/10
2010/2011	188 for publicly funded places	180 publicly funded (35 in English)	5.054/10

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 second year of the 4-year cycle, after passing a number of 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.

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Number of students

2006/2007

Year of study	Specialization	Total number of students	Number of students who obtained the necessary credits	Number of students who did not obtain the required credits	Number of withdrawn 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

2007/2008

Year of study	Specialization	Total number of students	Number of students who obtained the necessary credits	Number of students who did not obtain the required credits	Number of withdrawn students
First year	AE + TC	302	87	127	88
Second year	AE + TC	303	82	135	86
Third year	AE	93	19	52	22
Fourth year	AE	75	19	52	4
Fifth year	AE	85	56	28	1
Third year	TC	108	23	58	27
Fourth year	TC	98	67	25	6
Fifth year	TC	79	75	3	1

2008/2009

Year of study	Specialization	Total number of students	Number of students who obtained the necessary credits	Number of students who did not obtain the required credits	Number of withdrawn students
First year	AE + TC	257	88	131	38
Second year	AE + TC	241	58	142	41
Third year	AE	142	32	90	20
Fourth year	AE	125	85	32	8
Fifth year	AE	109	51	53	5
Third year	TC	131	30	83	18
Fourth year	TC	81	55	20	6
Fifth year	TC	116	80	34	2

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2009/2010

Year of study	Specialization	Total number of students	Number of students who obtained the necessary credits	Number of students who did not obtain the required credits	Number of withdrawn students
First year	AE + TC	143	58	64	21
Second year	AE + TC	209	85	99	25
Third year	AE	112	59	29	24
Fourth year	AE	102	75	16	11
Third year	TC	88	48	27	13
Fourth year	TC	78	71	7	0

AE=Applied Electronics

TC=Telecommunications

Note: The third column in the above tables includes re-enrolled students who withdrew before completing their studies in former years.

Average duration of study:

Academic year	Specialization	Average duration of study
2004/2005	AE	5.87 years
	TC	5.57 years
2005/2006	AE	5.60 years
	TC	5.22 years
2006/2007	AE	5.78 years
	TC	5.49 years
2007/2008	AE	5.82 years
	TC	5.39 years
2008/2009	AE	6.09 years
	TC	5.54 years
2009/2010	AE	7,20 for five years 4,11 for four years
	TC	6,57 for five years 4,06 for four years

Note: AE = Applied Electronics, TC = Telecommunications.

Structure of the Academic Year

The academic year consists of two 14-week semesters and three examination sessions. The license and dissertation (Master) examinations take place in June and February. The Admission 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 (two months).

Teaching

The teaching activity is organized in: courses, seminars, laboratory and project classes. A 100 % attendance of the laboratory classes is a prerequisite for each academic year.

Examinations and continuous assessment

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

Students can sit for their examinations and continuous assessments no more than three times, re-examination for grade improvement being included.

Dismissal and Readmission

By the end of a year, a student must have obtained a minimum number of 40 credit points from a total of 60/year, out of which a minimum number of 30 should be obtained after the summer session. If these conditions are not fulfilled, the student is removed from the faculty registers. A student who has been dismissed from the faculty is eligible to apply to that faculty for readmission the next year, having to pay for the expenses, until the missing obligations are completed.

Curriculum for the Academic Year 2010 - 2011

As mentioned above, in 2005 a new curriculum has been introduced, for the License-Master-Doctorate system, according to the Bologna Declaration. Also, since 2006, a study in English has been introduced. The Licence level curriculum in English has been designed and this year students from all years study it. These curriculums are detailed below.

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Field: Electronic Engineering and Telecommunications

No.	Teaching Line	C	S	L	P	Ex	Cr.
First Year - First Semester							
1	Calculus	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	Physical Education		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 Aided 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	Electrical and Electronic Measurements	2	1	1		E	4
7	Foreign Languages*		2			DE	2
8	Physical Education		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

Second Year - Third Semester							
1	Digital Integrated Circuits	2		2			4
2	Computer Networks 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	Physical Education		1				1
9	Practical Training						2
	Total	13	4	10		27	30

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Second Year - Fourth Semester							
1	Microeconomics	2	1				4
2	Signal Processing	2		2			5
3	High Frequency Techniques	2	1	1			4
4	Digital Processing Systems	2,5	0,5	2			5
5	Analog Integrated Circuits	2		2			4
6	Object Oriented Programming	2		2			4
7	Electronic Circuits Project				2		2
8	Physical Education		1				1
9	Practical Training						2
	Total	13	2	9	2	26	30

Field: Electronic Engineering and Telecommunications - Specialization: Applied Electronics

Third Year - Fifth Semester							
1	Management and Marketing	2	2	0	0	DE	4
2	Electronic Measuring Instruments	2	0	2	0	E	4
3	Radio Communications	2	0	2	0	DE	4
4	Power Electronics	2	0	2	0	E	4
5	Information Theory and Coding	2	1	1	0	E	4
6	Data Acquisition Systems	2	0	2	0	E	4
7	Basics of Flexible Intelligent Systems	2	0	2	0	DE	4
8	Practical Training					C	2
	Total	14	3	11	0	28	30
Third Year - Sixth Semester							
1	Decide on a teaching line from another specialization	2	0	2	0	E	4
2	Programmable Logic Systems	2	0	1	1	DE	6
3	Electromagnetic Compatibility	2	0	2	0	E	4
4	Construction and Technology of Electronic Equipment	2	0	2	0	E	4
5	Switching Power Electronics	2	0	2	0	E	4
6	Virtual Instrumentation	2	0	1	1	DE	6
7	Practical Training					C	2
	Total	12	0	12	0	24	30

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Field: Electronic Engineering and Telecommunications - Specialization: Applied Electronics

No	Teaching Line			C	S	L	P	T	Cr
Fourth Year - Seventh Semester									
1	Electronic and Telecommunications Testing Equipment			2		2		E	4
2	Software for Electronics and Telecommunications			2		1	1	DE	5
3	Modelling and Simulation			2		1	1	E	5
4	Electronic Driving Systems	Micro electronics	Sensors and Transducers	2		2		DE	4
5	Electronic Interfacing Equipments	VHDL	Signal Processors	2		2		E	4
6	Decide on a teaching line from another specialization			2		2		E	4
7	DSP Project						2	DE	4
	Total			12		10	4	26	30
Fourth Year - Eighth Semester									
1	External course			3	1,5	1,5		E	4
2	Decide on a teaching line from another specialization			3		3	0	DE	6
3	Automation	VLSI Circuits Design	Automation	3		3		E	4
4	Biomedical Electronics	Micro Electromechanical Systems	Distributed Control Systems	3		3		E	4
5	Software project						2	E	4
6	Diploma preparation								15
	Total			12	1,5	10,5	2	26	30

Field: Electronic Engineering and Telecommunications - Specialization: Techniques and Systems for Telecommunications

No	Teaching Line			C	S	L	P	T	Cr
Third Year - Fifth Semester									
1	Management and Marketing			2	2			DE	4
2	Electronic Measuring Instruments			2		2		E	4
3	Radio Communications			2		2		E	4
4	Power Electronics			2		2		E	4
5	Information Theory and Coding			2	1	1		E	4
6	Data Communications			2		2		DE	4
7	Telecommunications Circuits			2		2		DE	4
8	Practical Training							C	2
	Total			14	3	11	0	28	30

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Third Year - Sixth Semester							
1	Decide on a teaching line from another specialization	2		2		E	4
2	Decision and Estimation in Information Theory	2		1	1	DE	6
3	Television Systems	2		2		E	4
4	Telephony Transmission	2		2		E	4
5	Digital Switching Systems	2		2		E	4
6	Data Bases	2		1	1	DE	6
7	Practical Training					C	2
	Total	12	0	10	2	24	30

Field: Electronic Engineering and Telecommunications - Specialization: Techniques and Systems for Telecommunications

Fourth Year - Seventh Semester									
1	Electronic and telecommunications testing equipment		2		2		E	4	
2	Software for electronics and telecommunications		2		1	1	DE	5	
3	Modelling and simulation		2		1	1	E	5	
4	Radio Communications 2	Communications Protocols	2		2		DE	4	
5	Integrated Digital Networks								2
6	Decide on a teaching line from another specialization		2		2		E	4	
7	DSP Project		Development Project				2	DE	4
	Total		12		10	4	28	30	

Fourth Year - Eighth Semester								
1	External course		3	1,5	1,5		E	3
2	Decide on a teaching line from another specialization		3		3		E	3
3	Optical communications	Network security	3		3		E	4
4	Mobile communications	Networks Optimisation						
5	Software project					2	DE	4
6	Diploma preparation							15
	Total		12	1,5	10,5	2	24	30

Field: Electronic Engineering and Telecommunications – in English

No	Teaching Line	C	S	L	P	Ex	Cr.
First Year - First Semester							
1	Mathematics I	2	2			E	4
2	Mathematics II	2	2			E	4
3	Physics	2	1	1		DE	5
4	Electrical Circuits	2		2		DE	5

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5	Introduction to Computer Programming	2		2		DE	4
6	Culture and Civilization	1	1			E	2
7	Second Language*		2			DE	2
8	Physical Education		1			DE	1
9	Practical Training					C	2
	Total	12	9	5		26	29
First Year - Second Semester							
1	Mathematics III	2	2			E	4
2	Mathematics IV	2	1	1		DE	4
3	Materials Science	2		2		E	4
4	Mechanics	3		2		E	4
5	Electronic Devices	2		2		E	4
6	Applied Computer Programming	2		2		DE	4
7	Experimental Data Processing	1	1			DE	2
8	Physical Education		1			DE	1
9	Second Language*		2			DE	2
10	Practical Training					C	2
	Total	13	8	7		28	31

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

Second Year - Third Semester							
1	Electronic Circuits	2		2		E	5
2	Electrical Engineering Fundamentals	2	1	1		DE	4
3	Signals and Systems	2	1	1		E	4
4	Digital Integrated Circuits	2	1	1		E	4
5	Computer Aided Design	2		2		E	4
6	Electrical and Electronic Measurements	2	1	1		DE	4
7	Second Language			2		DE	2
8	Physical Education		1			DE	1
9	Practical Training					C	2
	Total	13	4	10		27	30
Second Year - Fourth Semester							
1	Analog Integrated Circuits	2	1	1		E	4
2	Microeconomics	2	1			DE	3
3	Computer Networks Architecture	2		2		E	4
4	Object Oriented Programming	2		2		E	4
5	Signal Processing	2		2		E	5
6	Microprocessors and Microcontrollers	2		2		E	5

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7	Electronic Circuits Project				2	DE	2
8	Physical Education		1			DE	1
9	Practical Training					C	2
	Total	13	4	9	2	28	30

Third Year - Fifth Semester

1	Electronic Instrumentation	2		2		E	4
2	Radio Communications	2		2		DE	4
3	Virtual Instrumentation	2		1	1	E	4
4	Information Theory and Coding	2	1	1		E	4
5	Data Communications	2		2		E	4
6	High Frequency Techniques	2		2		DE	4
8	Management and Marketing	2	2			DE	4
9	Practical Training					C	2
	Total	14	3	10	1	28	30

Third Year – Sixth Semester

1	Opt.1 Electromagnetic Compatibility or Digital Switching Systems	2		2		E	4
2	Programmable Logic Systems	2		1	1	DE	5
3	Power Electronics	2		2		E	4
4	Embedded Systems	2		2		E	4
5	Digital Telephony	2		2		E	5
6	Audio and Video Systems	2		2		DE	4
7	Engineering Ethics and Communications	1	1			DE	2
8	Practical Training					C	2
	Total	13	1	11	1	26	30

Fourth Year - Seventh Semester

1	Electronic Equipment Testing	2	0	2	0	E	5
2	Software Development	2	0	1	1	DE	5
3	Modelling and Simulation	2	0	1	1	E	5
4	Opt.2 VHDL Digital Signal Processors	2	0	2	0	E	4
5	Microelectronics	2	0	2	0	DE	5
6	Digital Integrated Networks	2	0	2	0	E	4
7	Project (Optional Topic 2)	0	0	0	2	DE	2
	Total	14	3	10	1	28	30

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Fourth Year – Eighth Semester							
1	Opt.3 Biomedical Electronics Optical Communications	3	0	3	0	E	4
2	Opt.4 Image processing Digital Radiocommunications	3	0	3	0	E	5
3	Electronic Packaging	3	0	3	0	E	4
4	Wireless Communications	3	0	3	0	E	4
5	Software Project	0	0	0	3	DE	5
6	DIPLOMA PROJECT						15
	Total	12	0	12	3	27	30

3.2. The "Master" level

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

Thus, the teaching staff treats the educational activity at this level 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 programme are:

- to accustom the young engineers with permanent intellectual activity;
- to raise the scientific curiosity of the students, but also to get them used to the stress 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 programme is similar to that of the "Diploma (Licensed) Engineer" programme. Its main features are:

- deep individual study;
- 2 years starting from 2006 and for the LMD system;
- the students (young engineers) graduate this level with a dissertation.

Until 2009, each of the three faculty departments offers at least one "Master" degree programme. The academic year 2009-2010 was the last one in which in master degree programme there were participants who completed five years of study. Programmes that have been developed in this period were:

- **Applied Electronics:**
 - *"Electronics of Intelligent Industrial Systems" (EIIS),*
 - *"Advanced Design and Testing Techniques in Electronics" (ADTTE).*

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- **Communications:**
 - *"Signal Processing in Telecommunications Networks" (SPTN)*
 - *"Traitement du Signal"* (Signal processing), in French (*TS*)
- **Measurement and Optical Electronics:**
 - *"Electronic Instrumentation"(EI)*

Starting from 2009 Master degree programme has been adapted to LMD system and seven Master degree programmes were offered. Two of them: Biomedical Engineering and Multimedia Technology are complementary.

Also starting with 2010-2011 has been introduced two programmes in English: *"Electronics of Intelligent Systems"* and *"Communications Networks Engineering "*.

- **Applied Electronics:**
 - *"Electronics of Intelligent Systems" (EIS),*
 - *"Electronics of Intelligent Systems", in English (EIS)*
 - *"Advanced Techniques in Electronics" (ADE),*
- **Communications:**
 - *"Communications Networks Engineering " (CN)*
 - *"Communications Networks Engineering " , in English (CN)*
 - *"Traitement du Signal"* (Signal processing), in French (*TS*)
 - *"Multimedia Technologies" (MT)*
- **Measurement and Optical Electronics:**
 - *"Electronic Instrumentation"(EI)*
 - *"Biomedical Engineering" (BE)*

Number of students 2006/2007

	Total number		Graduated	Withdrawn
	First year	Second year		
EIIS	18	-	-	-
SPTN	16	-	-	-
TS	15	-	-	-
ADTTE	16	-	-	-

Number of students 2007/2008

	Total number		Graduated (2008)	Withdrawn
	First year	Second year		
EIIS	17	18	13	5
SPTN	18	16	12	9
TS	16	13	5	11
ADTTE	18	11	8	5
EI	15	-	-	5

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Number of students 2008/2009

	Total number		Graduated (2009)	Withdrawn
	First year	Second year		
EIIS	30	13	10	3
SPTN	26	10	6	4
TS	15	11	8	3
ADTTE	26	14	8	6
EI	19	10	7	3

Number of students 2009/2010

	Total number		Graduated (2010)	Withdrawn
	First year	Second year		
EIIS	-	27	24	
SPTN	-	22	16	
TS	-	12	9	
ADTTE	-	20	16	
EI	-	10	7	
EIS	33	-		
ADE	28	-		
CN	41	-		
TS	26	-		
MT	35	-		
EI	22	-		
BE	22	-		

Number of students 2010/2011

	Total number		Graduated	Withdrawn
	First year	Second year		
EIS	31	33	30	
EIS (English)	-	-	-	
ADE	30	28	17	
CN	29	42	42	
CN (English)	25	-	-	
TS	-	26	23	
MT	28	35	23	
EI	-	22	10	
BE	28	22	14	

Curriculum for the Academic Year 2010-2011

Electronics of Intelligent Systems

Sem.	Course Title	Structure [hours/week]				Credit Points/ Evaluation
		C	S	L	P	
I	Bases in Signal Processing Signal and Digital Communication Systems Processors and Acquisitions Systems Modern Programming Techniques Statistic and Stochastic Modelling (2 of 5 disciplines will be chosen)	2	0	2	0	8/DE
	Optimization of Energy Converters Parameters	2	0	1	0	7/E
	Artificial Intelligence Elements	2	0	1	0	7/E
II	Real Time Systems Testing and Measuring Systems Interfacing Graphical Programming Image Processing Administration of Computer Networks (1 of 5 disciplines will be chosen)	2	0	1	0	7/E
	Expert Systems	2	0	1	0	7/DE
	Intelligent Control of Movement	2	0	2	0	8/E
	High Frequency Power Processors	2	0	2	0	8/E

Advanced Techniques in Electronics

Sem.	Course Title	Structure [hours/week]				Credit Points/ Evaluation
		C	S	L	P	
I	Signal and Digital Communication Systems Processors and Acquisitions Systems Modern Programming Techniques Statistic and Stochastic Modelling (2 of 5 disciplines will be chosen)	2	0	2	0	8/DE
	PCBA Design and Manufacturing	2	0	1	0	7/E
	Radio Rrequencies Measurements	2	0	1	0	7/E
II	Testing and Measuring Systems Interfacing Image Processing Administration of Computer Networks (1 of 3 disciplines will be chosen)	2	0	1	0	7/E
	Statistical Methods for Systems Control	2	0	1	0	7/DE
	Graphical Programming	2	0	2	0	8/E
	IC Design Oriented on Applications	2	0	2	0	8/E

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Communications Networks Engineering

Sem.	Course Title	Structure [hours/week]				Credit Points/ Evaluation
		C	S	L	P	
I	Bases in Signal Processing Signal and Digital Communication Systems Processors and Acquisitions Systems Modern Programming Techniques Statistic and Stochastic Modelling (2 of 5 disciplines will be chosen)	2	0	2	0	8/DE
	Statistical Signal Processing	2	0	1	0	7/E
	Advanced Topics in Communications Networks	2	0	1	0	7/E
II	Radio Networks Design Testing and Measuring Systems Interfacing Graphical Programming Image Processing (1 of 4 disciplines will be chosen)	2	0	1	0	7/E
	Administration of Computer Networks	2	0	1	0	7/DE
	Communications Networks Simulation	2	0	2	0	8/E
	Data, Audio and Voice Networks	2	0	2	0	8/E

Multimedia Technologies

Sem.	Course Title	Structure [hours/week]				Credit Points/ Evaluation
		C	S	L	P	
I	Bases in Signal Processing Signal and Digital Communication Systems Processors and Acquisitions Systems Modern Programming Techniques Statistic and Stochastic Modelling (2 of 5 disciplines will be chosen)	2	0	2	0	8/DE
	Advanced Multimedia Technologies	2	0	1	0	7/E
	Multimedia Programming	2	0	1	0	7/E
II	Digital Media Administration of Computer Networks Graphical Programming Data, Audio and Voice Networks (1 of 4 disciplines will be chosen)	2	0	1	0	7/E
	Graphic and Animation or Interactive Data Bases	2	0	1	0	7/DE
	Interactivity and Usability	2	0	2	0	8/E
	Image Processing	2	0	2	0	8/E

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Traitement du Signal (Signal Processing) in French

Sem.	Course Title	Structure [hours/week]				Credit Points/ Evaluation
		C	S	L	P	
II	Specific Circuits in Mobile Communications Administration of Computer Networks Biomedical Signal Processing Communications Networks Simulation (1 of 4 disciplines will be chosen)	2	0	1	0	7/E
	Neural Networks	2	0	1	0	7/DE
	Time/frequencies Representation	2	0	2	0	8/E
	Image Processing	2	0	2	0	8/E

Electronic Instrumentation

Sem.	Course Title	Structure [hours/week]				Credit Points/ Evaluation
		C	S	L	P	
I	Bases in Signal Processing Signal and Digital Communication Systems Processors and Acquisitions Systems Modern Programming Techniques Statistic and Stochastic Modelling (2 of 5 disciplines will be chosen)	2	0	2	0	8/DE
	Metrology and Quality Control	2	0	1	0	7/E
	Radio-Frequencies Measurements	2	0	1	0	7/E
II	Statistical Methods for Systems Control IC Design Oriented on Applications Image Processing Biomedical Signal Processing (1 of 4 disciplines will be chosen)	2	0	1	0	7/E
	Expert Systems	2	0	1	0	7/DE
	Graphical Programming	2	0	0	2	8/E
	Testing and Measuring Systems Interfacing	2	0	2	0	8/E

Biomedical Engineering

Sem.	Course Title	Structure [hours/week]				Credit Points/ Evaluation
		C	S	L	P	
I	Bases in Signal Processing Signal and Digital Communication Systems Processors and Acquisitions Systems Modern Programming Techniques Statistic and Stochastic Modelling (2 of 5 disciplines will be chosen)	2	0	2	0	8/DE
	Biomaterials Mechanic	2	0	1	0	7/E
	Biosensors	2	0	1	0	7/E

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II	Statistical Methods for Systems Control IC Design Oriented on Applications Image Processing Biomedical Signal Processing (1 of 4 disciplines will be chosen)	2	0	1	0	7/E
	Expert Systems	2	0	1	0	7/DE
	Graphical Programming	2	0	0	2	8/E
	Testing and Measuring Systems Interfacing	2	0	2	0	8/E

3.3. The "PhD Engineer" level

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

The first step of this study programme is the admission examination. After passing it, the candidate must sit for three or four further qualifying examinations in specific subjects. Having successfully passed these examinations, the doctoral candidates must present two or three essays about their research activity at the meetings of the faculty, thus giving others the opportunity to learn about their research activity and to debate upon their scientific interests. 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 programme is the elaboration and oral defence of the Ph.D. thesis.

The goals of this educational programme are:

- to familiarize the candidates with the latest results in their field of study. The thesis must provide original contributions to 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.

Since 1998, some of our Ph.D. students have been preparing their thesis in a co-tutulary system, having two Ph.D. advisors, one from our faculty and one from abroad (usually from a western European university).

PH.D. ADVISORS

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

PhD students

- Liviu LUCACIU: *Contributions to the Biometric Systems Development and Implementation*
- Cristian BURSAȘIU: *Contributions to the Optimization of Neural Network Applications Development*

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- Alin BRÎNDUȘESCU: *Contributions to the biological signals simulation using artificial neural networks*
- Ionuț MIREL: *Methods for Digital Video Images Processing*
- Călin LAR: *Contributions to the Sensorial Data Fusion*
- Sorin POPESCU: *Optimization of the electrical welding process by means of artificial neural networks*
- Laviniu ȚEPELEA: *Human-Machine Interface.*
- Lucian BUGLEA: *Smart Transducers Array*
- Daniel IANCHIȘ: *Cercetari privind sistemele de detectie a obstacolelor pentru nevazatori*
- Zoltan HARASZY: *Human-machine interfaces using acoustics virtual reality*
- Robert LORINCZ: *Driver circuit optimization for BLCD motors*
- Radu MARȘU: *Visual information processing using spiking neuronal network*
- Sebastian MICUȚ: *Reserch on e-Nose devices*
- David CRISTEA: *Universal circuit for biological sensors*
- Mihai-Emanuel BASCH: *Neuromorf circuits for obstacle detection*
- Teodor-Valentin SANDU: *Research on auditive implants optimization*
- Kristian MOZIK: *Biometric methods for person identification*
- Mihai POMARLAN: *Dinamic programming for robots moving planning*

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

PhD students

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

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

PhD students

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

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

PhD students

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

5. Scientific supervisor: *Prof. dr. ing. Dan LASCU*

PhD students

- Mircea GURBINA: *Contributions to nonlinear phenomena study in power converters*
- Aurel CIREȘAN: *Soft-switching converters with applications in green power processing*
- Vasile-Daniel DRAGHICI: *Contributions regarding intelligent driven for power converters*

6. Scientific supervisor: *Prof. dr. ing. Aurel GONTEAN*

PhD students

- Oana-Silvana POPESCU: *Digital modulation with FPGA*
- Paul HARFAS: *Wind turbine diagnostics using signal processing*
- Mihail-Octavian CERNAIANU: *Intelligent control for wind turbin motors*
- Cosmin CIRSTEA: *Wireless sensors networks*
- Ruxandra-Ioana RUSNAC: *Algorithms for mobile target detection*
- Liviu CRISAN: *Group coportament for mobile robots*
- Adrian-Constantin BERINDE: *Neural networks applications in robotics.*
- Emilian-Silviu GAVRILA: *Solutions for automotive testing*

7. Scientific supervisor: *Prof. dr. ing. Ioan NAFORNIȚĂ*

PhD students

- Mirela BIANU, *Contributions on adaptive signal processing in telecommunications*
 - Romulus REIS, *Non-Stationary Signal Description by Non-Parametrical Method*
 - Janos GAL, *Contributions on Kalman Filters Use in Telecommunications*
 - Marius SALAGEAN, *Non-Stationary Signal Description by Non-Parametrical Method*
 - Florin VANCEA, *Data Protection in Communication Networks*
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- Andy VESA, *Improvement of Digital Radio Systems Detection*,
 - Teodora PELA, *Traffic Optimization on Metropolitan Area Networks*,
 - Adina DABA, *Non-Stationary Signal Description by Non-Parametrical Method*,
 - Arpad IOZSA, *Beamforming techniques*.
 - Cristian-Alin MOS, *Security systems in road traffic*
8. Scientific supervisor: *Prof. dr. ing. Miranda NAFORNIȚĂ*
- PhD students*
- Radu LUCACIU, *Optical communication systems with OCDMA*
 - Mirela VIOR, *Quality transmission improvement using turbo codes*
 - Sorin POPA, *Synchronization techniques improvement for radio channel transmission systems*
 - Marius OLTEAN, *Radio channel equalization using cyclic prefix*
 - Florin Lucian MORGOS, *Radio channels equalization techniques improvement*
 - Ioan CARLIA, *Collaborative adhoc wireless mobile networks*
 - Marin MANGRI, *Optimizarea trancing-ului la protocoalele de timp real din IMS (IP Multimedia Subsystems)*
 - Calin SIMU, *Acquisition of EKG signals using Bluetooth*
9. Scientific supervisor: *Prof. dr. ing. Alexandru ISAR*
- PhD students*
- Ioana Firoiu (Adam), *Despeckling of sonar images by multi-resolution filtering*
 - Cristina Stolojescu, *Traffic predictions in wireless networks*.
 - Victor CUTEANU, *Contributions in satellite receiver design*.
 - Petru LAZAR, *Protocols in wireless communications networks*.
 - Ioan ANDOR, *Security techniques used in wireless communications networks*.
 - Beatrice, ARVINTI, *Tele monitoring for patients suffering from heart disease*.
 - Lucian, ARDELEAN, *Interference reduction techniques in WiMAX technology*.
 - Daniel BOJNEAGU, first year student.
 - Jamal MOUNTASIR, *Study on LTE wireless networks*
10. Scientific supervisor: *Prof. dr. ing. Corneliu I. TOMA*
- PhD students*
- Andreea GĂLEANU: *Contributions at the performance improvement of the GSM system*
 - Artur MULLER: *Contributions in implementing of the multimedia databases, with local and remote access*
 - Mirela L. 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*
 - Radu TĂNASE: *Ultrasound electronic systems for the movement evaluation in the fluid environment*
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- Mihai I. ONIȚĂ: *Video communications in multimedia applications.*
- Florin-Josef LĂTĂREȚU: *Contributions at the intelligent telecommunication network achievement.*
- Radu CLESIU, *Applications of the Petri networks in robotics.*
- Gheza-Gavril DOHI-TREPZSKER, *Video surveillance techniques for the detection of wathersed pollution using floats.*
- Sorin IVASCU, *Advanced techniques in image processing.*
- Dan-Cristian BOGOS, *Inteligent communications networks.*
- Dan-Mihai MIHAILESCU, *first year student.*
- Florentina-Anica BOTEZATU, *first year student*

11. Scientific supervisor: *Prof. dr. ing. Marius OTEȘTEANU*

PhD students

- Daniel POPA, *Object tracking in videosequences.*
- Ion-Cosmin DITA, *Detections and recognitions of matrix codes*
- Vasile-Horia MUNTEAN, *4G mobile communications networks*
- Pross Wolfgang (Germania), *Coding for error corrections for matrix codes,*

12. Scientific supervisor: *Prof. dr. ing. Radu VASIU*

PhD students

- Mihai I. ONIȚĂ: *Using new information technologies in e-learning process.*
- Cristian TECU, *Contributions to the use new information technologies in digital slide show.*
- Andrei TERNAUCIUC, *Contributions to achievement of personalized learning environments.*
- Bogdan Dragulescu, *Semantic WEB ontologies in educational environment.*
- Andrei RUSAN, *first year student*
- Michaela CALOTESCU, *IT tools to increase managerial capacity in large institutions.*
- Daniel IVANC, *mLearning technologies.*
- Adrian POPESCU, *Intelligent interactive multimedia platform for e-learning.*
- Mohamed KUSSAY, *Video quality estimation over wireless network.*
- Alexandru-Sorin PETAN, *Contributions to the achievement of interoperability of e-learning platforms.*
- Andrei GABOR, *first year student.*
- George MULEC, *Contributions to the security of multi-hop ad-hoc wireless networks based on IEEE's 802.11 standard.*
- Andrei-Marius GABOR, *firs year student.*

13. Scientific supervisor: *Prof. dr. ing. Alimpie IGNEA*

PhD students

- Liliana STOICA: *Contributions to Digital Signal Processing*
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- Ciprian Dughir: Contributions to antennas calibration
- Cristina Văliu: Contributions to the nonlinearities study of high-frequency circuits
- Cora IFTODE: Electromagnetic field effects on living organism
- Gabriel GĂȘPĂRESC: Perturbation monitoring in electrical networks
- Adrian MIHĂIUȚ: Contributions in antennas calibration
- Doru Lucian COCOȘ, Neural Networks and Fuzzy Logic applications to electronic meter calibration
- Teodor PETRIȚA, Contributions to radiofrequency disturbances monitoring

PHD THESIS DEFENDED

- Mircea BĂBĂIȚĂ: *Contributions to improve the quality of absorbed power in a.c.-d.c. power supply*, scientific supervisor Prof.dr.eng. Viorel POPESCU
- Benjamin DRAGOI: *Research on the conception and design of sinusoidal oscillators integrated in CMOS technology*, scientific supervisor Prof.dr.eng. Mircea CIUGUDEAN
- Marius OLTEAN, *Contributions to optimise the radio channel transmission using wavelet functions*, scientific supervisor Prof.dr.eng. Miranda NAFORNITA
- Radu LUCACIU, *Contributions in development of the optical communication systems with OCDMA*, scientific supervisor Prof.dr.eng. Miranda NAFORNITA
- Calin SIMU, *Contributions to the ECG signal analysis and processing*, scientific supervisor Prof.dr.eng. Miranda NAFORNITA
- Janos GAL, *Contributions on Kalman Filters Use in Telecommunications*, Scientific supervisor Prof.dr.eng. Ioan NAFORNITA
- Ioana FIROIU (ADAM), *Complex wavelet transform: applications to denoising*, scientific supervisor Prof.dr.eng. Alexandru ISAR
- Florin-Josef LĂȚĂREȚU: *Methods to improve the performance of the resilience and recovery in communications network*, Scientific supervisor: Prof. dr. eng. Corneliu TOMA
- Mirela-Laura IOANEȘIU: *Contributions to improve voice transmission quality in wireless networks based on IEEE 802.11 standard*, Scientific supervisor: Prof. dr. eng. Corneliu TOMA
- Cristian TECU, *Contributions to the use new information technologies in digital slide show*, Scientific supervisor: prof. dr. eng. Radu VASIU
- Ciprian DUGHIR: *Contributions to the monitoring of the power quality*, Scientific supervisor: Prof. dr. eng. Alimpie IGNEA

4. Research

The research activity is performed within two Research Centres and by various research teams, as follows:

4.1 Intelligent Industrial Electronic Systems - IIES Research Centre

The director of the IIES Centre is Prof. dr. ing. Mircea CIUGUDEAN.

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E-mail: mircea.ciugudean@etc.upt.ro

The Centre functions in accordance with the CNCSIS certificate, nr. 106/CC-C/11.05.2001.

Research Field

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

➤ **Integrated Circuits Design**

Keywords: ASIC, VLSI, DA, arithmetic coprocessor

➤ **Robotics**

Keywords: sensor, robot, transducers, industrial robot driving

➤ **Neural Computing and Intelligent Sensors**

Keywords: intelligent sensors, artificial neural networks, sensor data processing

➤ **Power Electronics**

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

➤ **Electronic Packaging and Testing**

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

RESEARCH PROJECTS, CONTRACTS AND GRANTS

RESEARCH PROJECTS

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

Title: Research on Emotional Facial Expression recognition in Complicated Environment

Value: 29 304 lei Total (18 755 lei on 2010)

Director: Conf. dr. ing. Cătălin-Daniel CĂLEANU,

Members: Prof. dr. ing. Radu VASIU, Prof. dr. ing. Virgil TIPONUȚ, Prof. dr. ing. Vasile GUI, Prof. dr. ing. Florin ALEXA, Conf. dr. ing. Corina BOTOCA, Drd. ing. Radu MÎRȘU, Drd. ing. Dan IANCHIȘ, Drd. ing. Zoltan HARASZY.

FIELD AND GRANT DESCRIPTION

Study of emotional facial expression recognition represents an advanced research topic in the fields of affective computing and human-computer interaction. It is important to improve the emotion intelligence of the machine and to implement an affective human-machine communication. However, current researches over the emotional facial expression recognition are usually limited to simple environments, thus cannot be successfully applied in human-computer interaction. Aiming at the above limits and considering the requirements for robust and automatic emotional facial expression recognition in real life, this project proposes the study of emotional facial expression recognition in complicated environment.

ACTIVITIES AND RESULTS

- **Activities for 2010:**

Several major face imagery processing topics have been addressed, e.g.:

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

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

• **Results for 2010:**

1. YuLi Xue, Xia Mao, C.D. Căleanu, ShanWei Lv., “Layered Fuzzy Facial Expression Generation of Virtual Agent”, Chinese Journal of Electronics, Vol. 19, No.1, pag. 69-74, 2010.
2. YuLi Xue, Xia Mao, C.D. Căleanu, ShanWei Lv., “Robust Facial Expression Recognition Under Occlusion Condition”, Journal of Beijing University of Aeronautics and Astronautics, (in Chinese), vol. 4, no. 36, 2010.
3. X.K. Wang, X. Mao, C.D. Căleanu, "Nonlinear Shape-Texture Manifold Learning", IEICE Transactions on Information and Systems, vol. E93-D, no. 7, pag. 2016-2019, Iulie 2010.
4. C.D. Căleanu, X. Mao, V. Tîponuț, Y. Xue, “Direct Search as Unsupervised Training Algorithm for Neural Networks”, 14th WSEAS International Conference on SYSTEMS , Latest Trends on Systems, Vol. I, pag. 575-579, Corfu Island, Greece ISSN: 1792-4235, ISBN: 978-960-474-214-1, Iulie 22-24, 2010.
5. YuLi Xue, Xia Mao, C.D. Căleanu, Q. Chang, “Layered fuzzy facial expression generation based on sociality, emotion and physiology”, Pattern Recognition and Artificial Intelligence, Volume 23, Issue 5, Pages 663-670, ISSN: 1003-6059, <http://mssbyrgzn.periodicals.net.cn/default.html>, October 2010.

Contact person:

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2. Identification number 88 / 25.06.2010

Titlu: *Advanced PSICE Modeling and Simulation*

Value: 4200 Euro + VAT (all on 2010)

Director: Aurel GONTEAN

Members: Ioan LIE, Marius RANGU

FIELD AND GRANT DESCRIPTION

Simulation strategies; custom modeling; datasheets constraints

ACTIVITIES AND RESULTS

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

Contact person:

aurel.gontean@etc.upt.ro

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

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

Total value: 500,000 EURO (48% SIPS, 30% UPT, 28% ATS). (53,345 LEI for 2010)

Annual Report 2010

Director: Lecturer.dr.eng. Marius RANGU

Members: Drd.eng. Daniela Mihet
Drd.eng. Paul Constantinescu
Dr.eng. Marian Bucos
Conf.dr. Romeo Negrea

Partners:

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

FIELD AND GRANT DESCRIPTION

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

ACTIVITIES AND RESULTS

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

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Research in INTEGRATED CIRCUITS DESIGN

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

Research in ROBOTICS

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

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

In the last years the main research subjects were:

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

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

Research in *NEURAL COMPUTING AND INTELLIGENT SENSORS*

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

FIELD DESCRIPTION

- VLSI Implementation of Cellular Neural Networks (CNN)
- Applications of CNN in Intelligent Sensors
- Applications of CNN in Robotics (Mobile Robots and Colony of Interacting Robots)

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

Hardware/Software resources:

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

RESEARCH TEAM

Prof.dr.eng. Virgil TIPONUȚ
Prof.dr.eng. Alexandru GACSADY
Assoc.prof.dr.eng. Catalin CALEANU
Lect.eng. Aurel FILIP

Lect.eng. Calin LAR
Lect.eng. Ioan GAVRILUT
Assist.eng. Laviniu TEPELEA

Contact person

Prof. dr. ing. Virgil TIPONUT
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Research in POWER ELECTRONICS

The main research themes investigated are:

- Improvement and development of new high-frequency PWM and resonant DC-DC converter topologies,
- Elaboration of new power factor correction circuits,
- New control techniques for power factor correction circuits, using classical solutions or neuro-fuzzy controllers,
- Research on AC-AC matrix converters and the corresponding control methods,
- Improvement of electrical drives using active power filters and fuzzy regulators,
- Research regarding topologies and operation improvement of active power filters,
- Development of experimental prototypes for different circuits derived from theoretical research.

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

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

RESEARCH TEAM

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

Contact person

Prof.dr.eng. Viorel POPESCU
Tel: +40 256 403344
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Research in *ELECTRONIC PACKAGING AND TESTING*

The research group in this domain is coordinated by Prof. dr. ing. Aurel GONTEAN and s.l.dr.ing. Marius RANGU, and includes two assistants and three graduated students. The group established relationships with several regional powerful companies in the electronic packaging field, like SOLECTRON, ABB, TELCO and NOVAR. Also, the group has preferential relations with ALCATEL Network Systems, Romania in the field of testing electronic equipment.

4.2 The Research Center on Instrumentation, Measurement and Electromagnetic Compatibility (IMCEM)

The director of the IMEMC research center is Prof. dr. ing. Alimpie IGNEA.

Web page: <http://www.meo.etc.upt.ro/imcem/>

E-mail: alimpie.ignea@etc.upt.ro

The Centre functions in accordance with The CNCSIS certificate, nr. 102/CC-C/11.05.2001.

IMCEM belongs to the Department of Measurements and Optical Electronics, Faculty of Electronics and Telecommunications. For the Electromagnetic Compatibility field, IMCEM is part of the Multi-User Research Base “National Interuniversity Centre for High Voltage Engineering and Electromagnetic Compatibility”.

The main research and development areas are:

- *Electric and Electronic Measurement and Instrumentation*: improving measurement methods, sensors and transducers;
- *Electromagnetic Compatibility*: EMC measurements and tests at high frequencies, electromagnetic supervision;

Main activities since the creation of the centre:

- IMCEM endowment with high specialized equipment for measurements, tests, and education through a TEMPUS programme, a Multi-User Research Base grant and other sources;
- the achievement of scientific and development research objectives through grants and scientific research contracts, consulting activities, technical expertise, technical assistance, design; ANTSI, CNCSIS grants were obtained and local collaboration with Siemens VDO Automotive and Solectron exists, to be continued and extended;
- Identification of new partners and research programmes.

Research in SIGNALS SPECTRAL ANALYSIS AND SYNTHESIS WITH APPLICATIONS TO DIGITAL MEASURING SYSTEMS

KEYWORDS: Data acquisition, spectral estimation, neural networks, digital synthesized AC calibrators.

FIELD DESCRIPTION

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

RESEARCH TEAM

- Prof. dr. ing. Traian JURCA: *Electronic Measuring Instruments. Precision Instrumentation. Programmable Measuring Systems*
- Prof. dr. ing. Dan STOICIU: *Electronic Measuring Instruments. Metrology, Quality and Reliability. Electronic Measurements, Sensors and Transducers*
- Prof. dr. ing. Aldo De SABATA: *Adaptive Methods in Measurements. Signal Processing*
- S.l. dr. ing. Septimiu MISCHIE: *Electrical And Electronic Measurements. Programmable Measuring Systems. Precision Instrumentation*
- As. dr. ing. Robert PASZITKA: *Microprocessor Systems Architecture. Data Acquisition Systems*

Research in ELECTROMAGNETIC COMPATIBILITY

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

FIELD DESCRIPTION

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

ACTIVITIES AND RESULTS

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

Research Contracts and Grants

1. Partnership grant for projects execution Nr.3/21039/2007, Researches concerning the elaboration and promotion for solar architectural solar solutions for PV systems integrated in buildings. (PASOR)

Director: Prof.dr.eng. Traian JURCA

Finance: State Budget – Education, Research and Young Ministry, Partnership Programs in Priority Domains

Value: 360,000 lei (12380 RON on 2010)

Members: prof.dr.ing. Ignea Alimpie,
prof.dr.ing. DeSabata Aldo,
prof.dr.ing. Stoiciu Dan,
prof.dr.arhitect. Bica Smaranda,
assoc. prof. dr. eng. Lascu Mihaela,
assoc. prof. dr. eng. Mischie Septimiu,
lector dr. Luminosu Ioan,
assist. prof. eng. Matiu Liliana,
assist. prof. eng. Dughir Ciprian,
assist. arh. Silvasan Claudiu,
assist. arh. Oprita Razvan,
lector dr. eng.Pazsitka Robert,
assist. prof. eng. Vasiu Gabriel,
assist. prof. eng. Ifode Cora

Duration: 36 months

Contractor: Trading Society for Research, Design and Equipment Production and Automatization

Partner P3: Politehnica University of Timisoara

FIELD AND GRANT DESCRIPTION

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

ACTIVITIES AND RESULTS

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

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RESEARCH TEAM

- Prof. dr. ing. Alimpie IGNEA: *Electrical And Electronic Measurements. Measurements In Industrial Processes. Measuring Systems In Electromagnetic Compatibility. Antenna Calibration. Nonlinearities study of high frequency devices*
- Prof. dr. ing. Aldo De SABATA: *Microwave and Optoelectronics Measurements. Antenna Calibration*
- Conf. dr. ing. Mihaela LASCU: *Measurement of Electrical and Non Electrical Quantities. Measurement in Industrial Processes. Virtual Instrumentation*
- Conf. dr. ing. Daniel BELEGA: *Measuring Systems in Electromagnetic Compatibility. Instruments for Measurement. Digital Processing Systems*
- As. ing. Ciprian DUGHIR: *Electromagnetic Supervision of Sites. Antenna Calibration*

Research in *SENSORS AND TRANSDUCERS*

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

FIELD DESCRIPTION

Optoelectrical and piezoelectric crystals are frequently used in practice. Due to their property of converting optical and mechanical signals, these materials are suitable for manufacturing transducers.

Theoretical and experimental approaches have been made on current measuring and magneto-optic and piezoelectric sensors. An I²C interface has been experimented.

RESEARCH TEAM

- Prof. dr. ing. Sever CRIȘAN: *Optical Electronics, Electrical Measurement, Sensors and Transducers*
- As. ing. Emil LUZAN: *Measurement of Environmental Factors, Measurement of Electrical and Non Electrical Quantities*
- S.l. dr. ing. Adrian VÂRTOSU: *Microwaves, Microwaves and Optoelectronics Measurement, Television Channels Broadcasted Via Satellite.*

INTERNATIONAL PROGRAMMES

1. COST 2100 International Program

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

2. Socrates/Erasmus mobility program 2010

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

4.3 Other research groups

Research group in Signal Processing

Research fields

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

Keywords

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

Digital Signal Processing, Digital Watermarking, Data Transmission on Radio Channels, Mobile Radio Communications

Research and Educational Projects, Contracts and Grants

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

Director: Prof.dr.eng Alexandru Isar

Value: 999,000 RON (174998.85 RON on 2010)

Members: Prof.dr.eng Ioan Naforita,

Assoc.prof.dr.eng Sorin MOGA (Telecom Bretagne)

Prof. Andrei Campeanu,

Lect. Dr. eng. Corina NAFORNITA,

drd. Ioana FIROIU

prep.drd. Cristina STOLOJESCU

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

FIELD AND GRANT DESCRIPTION

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

ACTIVITIES AND RESULTS

Selected Publications (<http://www.etc.upt.ro/isprc/publications.html>)

ISI Journals

- Advances in Electrical and Computer Engineering,

- Rev. Roum. Sci. Techn.-Electrotechn. et Energ,

IEEE Proceedings

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

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Research group in Image Processing and Multimedia technologies

Research Fields

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

Keywords

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

Research and Educational Projects, Contracts and Grants

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

Director: prof.dr.eng Vasile GUI

Value: 150,000 RON

Members: prof.dr.eng. Florin ALEXA

Assoc.rof.dr.eng. Cătălin CĂLEANU

Teach assist. dr. eng. Ciprian DAVID

Teach assist. eng. Gheorghe POPA

Dr.eng. Georgiana SIMION

FIELD AND GRANT DESCRIPTION

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

ACTIVITIES AND RESULTS

Development of a semantically guided tracker
Robust background estimation

Contact person:

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2. PNCD II project nr. 11-057/14.09.2007: Bio-medical signal acquisition and remote transmission over mobile computing equipments BIOMED-TEL

Director: Prof.dr.eng. Radu VASIU

Value 2010: 20,000 RON

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

Partners: Transilvania University of Brasov
Technical University of Cluj-Napoca
Siemens PSE Brasov
IBCI – Institute for Cardiovascular Diseases Iasi

FIELD AND GRANT DESCRIPTION:

Cardiovascular affections are a prime cause of mortality and morbidity in Romania. The risk of cardiovascular morbidity and mortality remains high despite the attempts of correcting the cardiovascular risk factors. In the field of cardiovascular pathology the

death risk by cardiovascular or vascular-cerebral accident persists even after the patients have left the hospital. Monitoring the health condition of these and the analysis of evolution trends of the biophysical and biochemical parameters represents an essential prevention factor.

The project envisages research, design and implementation of a flexible and self-adapting system for the monitoring of biological signals. Research and design activities will be oriented towards developing a system architecture and organization for remote monitoring and creating the interfaces for acquisition, monitoring and remote transmission to a hospital unit (hub). The signals acquired from the patient include: heart bio-potentials, blood pressure, blood O₂ concentration, heart and breath rate, temperature, blood glucose concentration etc. The mobile computing equipments (MCE) integrated in the systems will be: Personal Digital Assistant (PDA), and/or „smart phones” (mobile phones MP).

The project will use hard – and software platforms (PDA and MP) of broad usability, which correspond to the requirements of the application in terms of computing power and also by their low price. Based on intelligent interfaces that will be designed, the system will automatically integrate the sensors in „plug & play” mode and also adapt its communication strategy with the hub/dispatcher for cost minimization and for ensuring the reliability and availability of the data link. It cannot be neglected, that this system development strategy will offer high versatility and scalability and will allow for expanding project results beyond the field of remote medicine.

The project will develop and integrate two categories of **intelligent interfaces**: 1. specific to signal **acquisition** from sensors placed on the patient and 2. **communication** – dedicated (by wire or wireless) necessary for warning/alert messages transfer and also for data transfer to the hospital hub. Remote data-transmission will allow for communication technologies, like: Near Field Communication (RFID, ZigBee, RuBee, Bluetooth), remote wireless: GSM/GPRS, EDGE, UMTS, Wi-Fi, WiMax as well as the wire based ISDN and Ethernet.

The project is relevant to research direction “1 – *Information and communication Technology*”, theme priority: “1.6. *Technologies for distributed systems and embedded systems*”, aimed at developing of new technologies for integrated systems based on biomedical sensors networks (specific objective 1.6.14). The project objectives envisage also the development of applications for communication and computing embedded systems (specific objectives 1.6.17 and 1.6.16) ensuring local data processing and transmission to the hospital hub.

The purpose is to develop new technologies for integrated systems based on intelligent sensor networks for monitoring biological signals, remote transmission and processing for prevention and diagnosis. Envisaged are both theory development of architecture and organization of the systems for intelligent sensor networks (wire based or wireless) as well as practical implementation and testing of the mobile monitoring system carried by the patient. The proposal has innovative characteristics: the architecture and organization; the „plug&play” interfaces in compliance with the IEEE 1451 standard; the integration based on widespread platforms (PDA, MP); processing, analysis and

detection of alerts using also „artificial intelligence” methods, development of strategies allowing for high reliability of the data link with the hospital hub, all these are characteristics of a modern and extremely useful solution for the developments in the field of bioengineering. The project will create the conditions for radically improved material bases required for the monitoring of the main biological parameters of the patient in the ambulatory which will increase the efficiency of the medical art, especially prevention, reduce the costs of medical assistance and extend the experimental base, very necessary in the field. Also, the formative component, especially by integrating young researchers in a field with real prospects contributes to the relevance of the project.

MAIN ACTIVITIES:

- Analysis of the current world wide developments in the field of ambulatory monitoring of biological parameters acquired signals of processing techniques and methods, instrumentation and dedicated sensors. The stress will be laid on advanced signal processing techniques for preventing or early detection of the patient’s health state deterioration;
- Definition of the full specifications – hardware and software for the monitoring application;
- Development of system architecture and organization, adequate for monitoring;
- Design of acquisition and communication interfaces at MCE in accord with the specification including those regarding energy consumption minimization;
- Development of acquisition, processing, analysis, storage/archiving, alert and communication MCE programs with the hub for the acquired signals;
- Training of the young researchers, result dissemination and increase of team visibility for attracting new partners and creating accession conditions to European funds;

Development of the material research bases of the partners and subsequently of interdisciplinary research laboratories: electronics, medicine, telecommunication in the four university centers. It is envisaged that these will function financially autonomous which will allow for the permanent updating of the proposed system.

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

Director: Prof.dr.eng. Radu VASIU

Value 2010: 19,713 RON

Members: Prof.dr.eng. Corneliu TOMA
Assoc.lect.eng. Diana ANDONE
Lect.dr.eng. Mugur MOCOFAN
Assist.eng. Marian BUCOS
Assist.eng. Mihai ONITA
Eng. Marius CONDREA

PhD student Iasmina ERMALAI
PhD student Andrei TERNAUCIUC
PhD student Cristian TECU
Partners: Academy of Economic Studies
Institute of National Economy
“Politehnica” University of Bucharest
Centre for Industries and Services Economy
Bridgeman SRL
Commercial Academy Satu Mare
Artifex University

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

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

MAIN ACTIVITIES:

- Analysis of the risk factors in the evolution of the international technology transfers, especially at the level of small and medium enterprises in Romania;
- Realization of new models for the technology transfer processes in the field of international know-how management, according to the specific Romanian conditions (business intelligence)
- Re-engineering of the processes related to Intellectual Property, with the goal to involve universities as main actors in the field

- Creation of an intuitively and interactiv instrument on the web (e-business portal), able to support the use of the models of international know-how management
Initiation of new collaborative business processes in the field of technological transfers, able to stimulate innovation in Romania

International Projects

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

Director: Prof.dr.eng. Radu VASIU

Value: 365.747 EURO

Members: Assoc.lect.eng. Diana ANDONE
Lect.dr.eng. Mugur MOCOFAN
Assist.eng. Marian BUCOS
Assist.eng. Mihai ONITA
Eng. Marius CONDREA
Lucia RAZMERITA, journalist
Cristian TECU, PhD student
Iasmina ERMALAI, PhD student
Andrei TERNAUCIUC, PhD student
Bogdan DRAGULESCU, PhD student

Partners: University of Palermo, Italy
Baltic Education Technologies Institute, Lithuania
University of Miskolc, Hungary
Oulu University of Applied Sciences, Finland
University of Brighton, UK
VISIONI Di Caro arch. Ernesta, Italy
Euro-Contact Business School, Hungary
BRIDGEMAN SRL, Romania
JME Associates Ltd, UK

2. Leonardo da Vinci II project “ESIL - European Sustainable Innovation License (for SME’s)”, Agreement LLP/LdV/TOI/2008/AT/23

Director: Prof.dr.eng. Radu VASIU

Value: 11.157 EURO

Members: Assoc.lect.eng. Diana ANDONE
Assist.eng. Marian BUCOS
Assist.eng. Mihai ONITA
Cristian TECU, PhD student
Iasmina ERMALAI, PhD student
Andrei TERNAUCIUC, PhD student

Partners: Cleaner Production Centre Graz, Austria
Stenum GmbH, Austria

Bit Media E-Learning Solution, Austria
University of Maribor, Slovenia
Enviros, Czech Republic
AREA Science Park, Italy
Insin, Germany
LTC, Sweden
Cork Institute of Technology, Ireland
Hess Innovation, Switzerland

FIELD DESCRIPTION:

Aims of the project:

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

Estimated results of the project:

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

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

5. Publications

5.1 Papers

1. Y. Xue, X. Mao, Căleanu Catalin, ShanWei Lv; *Layered Fuzzy Facial Expression Generation of Virtual Agent*; Chinese Journal of Electronics; Vol. 19, No.1, pp.69-74, ISSN 1022-4653
2. N.D. Trip, S. Lungu, V. Popescu; *Modelling of Switched Mode Fly-back Supply for Engineering Education*; Advances in Electrical and Computer Engineering, 2010, Vol. 10, Nr. 1., pp.100-105, e-ISSN 1844-7600

3. Isar Alexandru, Moga Sorin, Isar Dorina; *Denoising Images using a New Type of Bishrink Filter*; Revue Roumaine des Sciences Techniques - Serie Électrotechnique et Énergétique; 55 (1), pp.59-68, ISSN 0035-4066
4. X.K. Wang, X. Mao, Căleanu Catalin; *Nonlinear Shape-Texture Manifold Learning*; IEICE Transactions on Information and Systems; E93-D, no. 7, pp.2016-2019, ONLINE ISSN 1745-1361; PRINT ISSN 0916-8532
5. Isar Alexandru, Moga Sorin, Isar Dorina; *Denoising SONAR Images Using a Bishrink Filter with Reduced Sensitivity*; Revue Roumaine des Sciences Techniques - Serie Électrotechnique et Énergétique; 55 (2), pp.181-190, ISSN 0035-4066
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7. Căleanu Catalin, X. Mao, V. Tiponut, Y. Xue ; *Direct Search as Unsupervised Training Algorithm for Neural Networks*; 14th WSEAS International Conference on SYSTEMS, Latest Trends on Systems, Corfu Island, Greece; pp.575-579, ISSN: 1792-4235, ISBN: 978-960-474-214-1
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10. F. Prutianu, Popescu Viorel; *Actual configuration of wind power conversion systems and further aspects of wind turbines*; Journal of Electrical and Electronic Engineering, Oradea, ISSN 1844-6035; Vol. 1, pp.167-171
11. D. Trip, Popescu Viorel, J. Dudic; *Modeling and state control of switched mode dc-dc buck converter*; Journal of Electrical and Electronic Engineering, Oradea, Vol.1, pp.233-236, ISSN 1844-6035
12. Firoiu Ioana, Isar Alexandru, Isar Dorina; *A Bayesian Approach of Wavelet Based Image Denoising in a Hyperanalytic Multi-Wavelet Context*; WSEAS TRANSACTIONS on SIGNAL PROCESSING; Issue 4, vol.6, pp.155-164, ISSN 1790-5052
13. YuLi Xue, Xia Mao, Căleanu Catalin, Q. Chang; *Layered fuzzy facial expression generation based on sociality, emotion and physiology*; Pattern Recognition and Artificial Intelligence; 23(5), pp.663-670, ISSN 1003-6059

14. Marllene Daneti; *A model based approach for pipeline monitoring and leak locating*; MELECON 2010 - 2010 15th IEEE Mediterranean Electrotechnical Conference ; pp.624-629, ISBN 978-1-4244-5793-9
15. Cernaianu M., Harfas P., Gontean Aurel-Stefan; *Code parallelization for wind speed model generator*; 33rd International Spring Seminar on Electronics Technology, ISSE 2010, Warsaw, Poland; pp.294-298, ISBN 978-1-4244-8448-5
16. I. Lie, C. Ionici, Gontean Aurel-Stefan, M. Cernaianu; *EDK Implemented Temperature Controller*; 33rd International Spring Seminar on Electronics Technology, ISSE 2010, Warsaw, Poland; pp.202-203; ISBN 978-1-4244-8448-5
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18. Ruxandra Rusnac, Gontean Aurel-Stefan; *Modeling and simulation of wireless sensor networks for event detection*; International Joint Conference on Computational Cybernetics and Technical Informatics (ICCC-CONTI); pp.535-540; ISBN 978-1-4244-7432-5
19. Firoiu Ioana, Isar Alexandru, Isar Dorina; *A Maximum A Posteriori Approach of Hyperanalytic Wavelet Based Image Denoising in a Multi-Wavelet Context*; Proceedings of the 9th WSEAS International Conference on SIGNAL PROCESSING (SIP '10), Catania, Italy, pp.113-119, ISBN 978-0-4702-902-5
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21. Szabo R., Gontean Aurel-Stefan, Lie I., Babaita M.; *Creating an Oscilloscope Driver*; WSEAS International Conference of the Institute for Environment, Engineering, Economics and Applied Mathematics, IEEEAm, Applied Computer Science (ACS), Malta; pp.220-225, ISBN 978-960-474-225-7
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- Symposium on Intelligent Systems and Informatics (SISY), 2010 ; pp.87-92, ISBN 978-1-4244-7394-6
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35. Naornita Corina, Firoiu Ioana, Isar Dorina, Boucher J.-M., Isar Alexandru; *A Second Order Statistical Analysis of the Hyperanalytic Wavelet Transform*; Proceedings of the 9th International Symposium on Electronics and Telecommunications ISETC 2010, Timișoara, November 11-12, 2010, pp.311-314, ISBN 978-1-4244-8458-4
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45. Lucaciu Radu, Mihăescu Adrian; *Deconvolutional OCDMA for Indoor Wireless Optical Communications*; Carpathian Journal of Electronic and Computer Engineering; vol. 3, 2010, pp.53-56, ISSN 1844-9689
46. Marius Oltean, Miranda Nafornta; "*Wavelet OFDM Performance in Frequency Selective Fading Channels*"; Proceedings of IEEE International Conference Communications 2010, Bucuresti, Romania, June 10-12; pp.343-346, ISBN 978-1-4244-6363-3
47. Kovaci Maria, Balta Horia; *Comparing the Performance of Duo-Binary Turbo Codes on Rayleigh Channel*; Proceedings of IEEE International Conference, Optim 2010, Brasov, Romania, vol. IV; pp.953-956, ISBN 1-4244-1545-4
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49. Firoiu Ioana, Isar Alexandru, Isar Dorina; *A Maximum A Posteriori Approach of Hyperanalytic Wavelet Based Image Denoising in a Multi-Wavelet Context*; Proceedings of the 9th WSEAS International Conference on SIGNAL PROCESSING (SIP '10), Catania, Italy; p.113-119, ISBN 978-0470-29025-5
50. Arvinti Beatrice, Toader Dumitru Costache Marius, Isar Alexandru ; *Electrocardiogram Baseline Wander Removal Using Stationary Wavelet Approximations*; Proceedings of IEEE International Conference, Optim 2010, Brasov, Romania, vol. IV; p.890-895, ISBN 1-4244-1545-4
51. Corina Nafornta, Ioana Firoiu, Dorina Isar, Jean-Marc Boucher, Alexandru Isar; *A Second Order Statistical Analysis of the 2D Discrete Wavelet Transform*; Proceedings of IEEE International Conference Communications 2010, Bucuresti, Romania, June 10-12; p.145-148, ISBN 978-1-4244-6363-3
52. Balta Maria, Nafornta Miranda, Kovaci Maria, Balta Horia; *Designing Convolutional Codes used in Multi-Binary Turbo Codes*; Proceedings of IEEE International Conference Communications 2010, Bucuresti, Romania; p.195-198, ISBN 978-1-4244-6363-3
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60. Balta Horia, Kovaci Maria, Nafornta Miranda, Balta Maria; *Multi-Binary Turbo-Code Design based on Convergence of Iterative Turbo-Decoding Process*; Proceedings of the 5th European Conference on Circuits and Systems for Communications (ECCSC'10), Belgrade, Serbia; p.240-243, ISBN 978-86-7466-394-3
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115. Aldo De Sabata, Ladislau Matekovits; *Design charts for grounded, elliptically shaped microstrip periodic structures featuring electromagnetic band-gap*; 8th International Conference on Communications (COMM), București, Romania, June 10-12, 2010, p.239-242, ISBN 978-1-4244-6362-6
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129. D. Belega, D. Dallet, D. Petri; *Optimal Windows for Sine-Wave Amplitude Estimation by the Energy-Based Method*; 17th Symposium IMEKO TC4, 17th Symposium IMEKO TC19 and 15th IWADC Workshop Instrumentation for the ICT Era, Septembrie 9-10, 2010, Kosice, Slovakia
130. Ladislau Matekovits, Aldo De Sabata, Karu P. Esselle; *Effects of the Biasing Network in a Parallel Plate Waveguide Periodic Unit Cell Featuring Switched Electromagnetic Band Gap*; Asia-Pacific Microwave Conference 2010, Yokohama, Japan, Dec. 7-10; ISBN 978-4-9023-3921-5

131. Traian Jurca, Eugenia Tulcan-Paulescu, Ciprian Dughir, Mihaela Lascu, Paul Gravila, Aldo De Sabata, Ioan Luminosu, Coleta De Sabata, Marius Paulescu; *Global Solar Irradiation Modeling and Measurements in Timisoara*; Physics Conference TIM-10, Timisoara, 25-27 noiembrie 2010; Abstract Book of the Physics Conference TIM-10; pag. 137, ISBN 978-973-125-323-7
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5.2 Books

1. Cătălin-Daniel CALEANU, Virgil TIPONUT, Aurel FILIP, Valentin MARANESCU, *Electronic Devices*, Politehnica Publishing House, 182 pages, ISBN 978-606-554-042-2
2. Cătălin-Daniel CALEANU, Aurel FILIP, Virgil TIPONUT, *Electronic Devices and Electronic Circuit*, Politehnica Publishing House, 195 pages (published in Romanian), ISBN 978-606-554-160-3
3. Virgil TIPONUT, Ioan GAVRILUT, Alexandru GAVCSADI, *Autonomous Mobile Robots Driven with Artificial Neuronal Networks*, Politehnica Publishing House, 2009, 286 pages, ISBN 978-606-554-167-2 (published in Romanian)
4. Ioan Buciu, Ioan Nafornta and Cornelia Gordan; *Facial Expression Synthesis and Animation; Affective Computing and Interaction: Psychological, Cognitive and Neuroscientific Perspectives*; Didem Gokcay and Gulsen Yildirim (Eds.); IGI-Global; 438; 22 personal contributions; ISBN 978-1-61692-892-6
5. Lucaciu Radu; Contributions to development of the optical communications systems with OCDMA; PhD Thesis (in romanian), Politehnica Publishing House, 140; ISBN 978-606-554-208-2
6. Coleta De Sabata, Ioan Luminosu, Aldo De Sabata, *Traditions and perspectives in solar energy at "Politehnica" University of Timisoara*; Excelsior Art Publishing House Timisoara, 2010, 214 pages, (published in Romanian)
7. D. Belega, C. Dughir, G. Gasparesc, *Measuring techniques sensors and traductors. Practical applications*. "Politehnica" Publishing House, Timisoara 2010, 102 pages (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 The International Symposium of Electronics and Telecommunications - "ETc 2010" November 11-12, 2010

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

The International Symposium of Electronics and Telecommunications, which is a biennial scientific event organized by our faculty, has come to the ninth edition. After technical revision, the papers were published in dedicated volumes of the Scientific Bulletin of the faculty which was included in IEEE eXplore databases <http://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=5676245>.

The last edition took place in 2010, and had as a technical co-sponsorship IEEE, IEEE Romanian Section, IEEE ComSoc German chapter. More than 150 participants from four continents contributed with 101 accepted papers distributed in 11 working sections (see <http://www.etc.upt.ro/other/isetc2010/home.php>).

The program of the symposium is presented below.

Thursday, November 11th

09³⁰ -12⁰⁰ Opening plenary session room D1

- Welcome speech - Prof. Dr. Eng. Marius Otesteanu, Dean of the Faculty of Electronics and Telecommunications
- Keynote speaker: Dr. Christian von Albrichsfeld, CEO Continental Automotive Timisoara
- Keynote speaker: Iulian Costea - Chief Marketing Officer Alcatel-Lucent South East Europe
- Keynote speaker: Prof. Ioannis Pitas, Aristotle University of Thessaloniki and CERTH/ITI, Greece, **Human centered Video Analysis For Multimedia Postproduction**

12⁰⁰ -12³⁰ Coffee break

12³⁰ -19³⁰ Afternoon sessions with a 15 minutes coffee break at 15⁴⁵.

20³⁰ Gala dinner - CPII Restaurant

Friday, November 12th

09⁰⁰ -14⁰⁰ Morning session with a 15 minutes coffee break at 11⁰⁰.

Thursday, November 11th

Room A105 12³⁰ – 15⁴⁵ COMMUNICATIONS 1

Chairmen: Prof. Dr. Eng. Katsumi Sakakibara, S.I. Dr. Eng. Cornel Balint

1. **Long Term Evolution Primary Synchronization Algorithms**, Alexandru Andreescu, Alexandru Ghita, Andrei Alexandru Enescu, Cristian Anghel
2. **Achieving Secondary Synchronization for Downlink in the Long Term Evolution Standard**, Mihai Bartis, Vlad Mocanu, Andrei Alexandru Enescu, Cristian Anghel
3. **A physical layer simulator for WiMAX**, Marius Oltean, Maria Kovaci, Jamal Mountassir, Alexandru Isar, Petru Lazar
4. **A Handover Scheme for Broadband Wireless Mobile Networks**, Dimitar Radev, Ivan Kurtev, Dragan Stankovski, Svetlana Siarova
5. **Outage Probability of Cooperative Multi-Hop Relay Networks with MDS Codes at Link-Level**, Katsumi Sakakibara, Daichi Ito, Jumpei Taketsugu
6. **Low-Power Wireless Transceiver – Total Channel-Loss Based Power Consumption Model**, Nikola Zogovic, Goran Dimic, Dragana Bajic
7. **A Study of the Permutation Schemes Used in Mobile Wireless Communications**, Ioan Eugen Andor, Lucian Ardelean, Horia Balta, Maria Kovaci, Marius Oltean
8. **Scheduling Techniques Evaluation in LTE systems with Mixed Data Traffic**, Cornel Balint, Georgeta Budura, Eugen Marza
9. **WiMAX versus LTE; An overview of technical aspects for Next Generation Networks technologies**, Vasile Horia Muntean, Marius Ottesteanu
10. **Network Management Extensions, Performing Network Management Activities**, Mihnea A. Magheti, Andrei N. Ciobanu, Eduard C. Popovici

Room A106 12³⁰ – 15⁴⁵ COMMUNICATIONS 2

Chairmen: Prof. Dr. Eng. Victor Croitoru, Prof. Dr. Eng. Virgil Dobrota

1. **TLS Protocol: Secure protocol with client puzzles**, Raluca Catargiu, Monica Borda
2. **Using kerberos to secure TLS protocol**, Raluca Catargiu, Monica Borda
3. **Analysis and Simulation of a Predictable Routing Protocol for VANETs**, Roxana Zoican, Dan Galatchi
4. **Implementation of QoS-aware Virtual Routers**, Andrei Bogdan Rus, Melinda Barabas, Georgeta Boanea, Virgil Dobrota
5. **Direction – of – Arrival Estimation for Uniform Sensor Arrays**, Andy Vesa, Arpad Iozsa
6. **Multimodal access control systems**, Marius Daniel David, Monica Borda
7. **Person authentication technique using human iris recognition**, Marius Daniel David, Monica Borda

8. **Mobile banking: deploying and consuming web services**, Catalin M. Popa, Victor Croitoru, Eugen Pop
9. **Secure and Flexible Model for Firewall Policy Management**, Daniel Gheorghica, Victor Croitoru
10. **Optimized real-time and load balanced routing in dynamic networks by using genetic algorithm**, Majed ValadBeigi, Hamid Nabizadeh Alamdari, Maghsoud Abaspour

Room A108 12³⁰ – 15⁴⁵ POWER ELECTRONICS & ROBOTICS

Chairmen: Prof. Dr. Eng. Axel Graeser, Prof. Dr. Eng. Viorel Popescu

1. **Ambient Intelligence and Rehabilitation Robots**, Axel Graeser
2. **Control of single phase inverters for wind energy conversion using PWM techniques**, Florin Prutianu, Viorel Popescu
3. **Digital Control for Switched Mode DC-DC Buck Converters**, Nistor Daniel Trip, Sanda Dale, Viorel Popescu
4. **Wireless Power Supply Using PIC18F448**, Petru Papazian, Mircea Babaita, Aurel Gontean
5. **Effects of Increasing Switching Frequency in Frequency Modulated Power Converters**, Janis Jankovskis, Deniss Stepins, Dmitrijs Pikulins
6. **Hardware implementation of a PIC18F448 based TIM for IEEE1451.2 compliant actuator control**, Petru Papazian, Mircea Babaita
7. **Euler-Bernoulli Equation Forever but Now in a New Form**, Mirjana Filipovic
8. **An autonomous robotic system**, Dan-Marius Dobrea, Monica-Claudia Dobrea

Room A116 12³⁰ – 15⁴⁵ INSTRUMENTATION AND MEASUREMENT & MICROWAVES

Chairmen: Prof. Dr. Eng. Dan Stoiciu, Prof. Dr. Eng. Aldo DeSABATA

1. **Highway Road Traffic Information and Monitoring System**, Mihai Cadariu, Monica Sabina Crainic
2. **Numerical Exploration of Filtering Properties of some Shielded High Impedance Surfaces**, Aldo De Sabata, Ladislau Matekovits
3. **Electrical Power Network Disturbance Detection and Monitoring System**, Dughir Ciprian
4. **A Study of the External Factors that Affect the Measurement Data of a MEMS Gyroscope Sensor – Towards an Inertial Navigation System**, Lucian Ioan Iozan, Corneliu Rusu, Jussi Collin, Jarmo Takala
5. **On oscillation based filter testing**, Nicolae Cojan, Arcadie Cracan, Liviu Goraş
6. **Metamaterial leaky-wave and resonant type antennas**, Alexandru Bogdan Ochetan, George Lojewski

7. **An Analog Predistorter for Nonlinear High-Power Amplifiers**, X.L. Sun, S.W. Cheung, T.I. Yuk
8. **A Circular-shaped Time-delay Line Inspired by CRLH TL Unit Cell for UWB Operation**, J. Zhang, S.W. Cheung, T.I. Yuk
9. **Design of Power Efficient Power Amplifier for B3G Base Stations**, Abubakar Sadiq Hussaini;

Room A105 16⁰⁰ – 18⁰⁰ EDUCATION

Chairmen: Prof. Dr. Eng. Tiponut Virgil

1. **Taking Steps in Understanding Multipath Propagation in Fluid Filled Pipelines**, Marllene Daneti
2. **Semantic MediaWiki Interoperability Framework from Semantic Social Software Perspective**, Cornelia-Flavia Veja, Gregor Hagedorn, Gisela Weber, Mircea Giurgiu
3. **A SPICE Method for Designing Digital Filters from Analog Filters**, Corneliu Rusu, Lacrimioara Grama, Jarmo Takala
4. **Testing the viability of Podcasting in a particular eLearning system**, Iasmina Ermalai, Mihai Onita, Radu Vasii
5. **Designing a Semantic Web Ontology for E-learning in Higher Education**, Marian Bucos, Bogdan Dragulescu, Marius Veltan

Room A106 16⁰⁰ – 19³⁰ COMMUNICATIONS 2

Chairmen: Prof. Dr. Eng. Tudor Palade, Conf. Dr. Eng. Georgeta Budura

1. **A Software Demonstrator for IEEE 802.21 Media Independent Handover in Heterogeneous Networks**, Valentin Andrei, Eduard C. Popovici, Octavian Fratu, Simona Halunga
2. **Conventional and optimum multiuser detectors performances for image transmission**, Carmen Voicu, Simona Halunga, Dragos Vizireanu, Octavian Fratu
3. **Implementation of a Security Layer for the SSL/TLS Protocol**, Mihai ORDEAN, Mircea GIURGIU
4. **Radio coverage and performance analysis for local area networks**, Cristian Androne, Tudor Palade
5. **Comparing the Performance of Duo-Binary Turbo Codes on Rice Flat Fading Channel**, Maria Kovaci, Horia Balta
6. **Estimators of the indoor channel for GPS-based pseudolite signal**, Alexandru Rusu- Casandra, Elena Simona Lohan, Ion Marghescu
7. **Towards Improving Positioning With the Use of GPS and EGNOS**, Andrei Marinescu, Dragos Catalin

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8. **A Study of Mobility Management using IEEE 802.21**, Alexandru Vulpe, Serban - Georgica Obreja, Octavian Fratu
9. **Design of an modified RFB protocol and implementation in an ultra thin client**, Daniel Zinca
10. **Analyze of Sensor Networks for Poachers' and Wildlife Monitoring**, Alina-Mihaela Bădescu, Octavian Fratu, Simona Halunga, Alexandru Frujină, Ioana Marcu
11. **MMSE Synchronous Systems Behaviour in Different Types/Length of Spreading Sequences Environment**, Cristinel Vasile, Simona V. Halunga, Ioana M. Marcu, Octavian Fratu, Alina Badescu

Room A108 16⁰⁰ – 19³⁰ SIGNAL PROCESSING

Chairmen: Prof. Dr. Eng. Alexandru Isar, Prof. Dr. Eng. Lucian Stanciu

1. **A Frequency Domain Method for Speech Separation in a Reverberant Room** , Septimiu Mischie, Georgiana Simion
2. **ECG Statistical Denoising in the Wavelet Domain**, Beatrice Arvinti, Marius Costache, Marius Oltean, Dumitru Toader, Alexandru Isar
3. **A Second Order Statistical Analysis of the Hyperanalytic Wavelet Transform**, Corina Nafornita, Ioana Firoiu, Dorina Isar, Jean-Marc Boucher, Alexandru Isar
4. **Speech De-noising System with Non Local Means Algorithm**, Sorin Zoican
5. **Apodizing filters for digital audio equalizers**, Lucian Stanciu, Cristian Stanciu
6. **An optimal full-genetic technique used to train RBF neural networks**, Iulian-Constantin Vizitiu, Nicolaescu Ioan, Stoica Adrian, Ciotirnae Petrica, Radu Adrian
7. **Adaptive algorithms for double-talk echo cancelling**, Ioana Homana, Marina Topa, Botond Sandor Kirei, Cristian Contan
8. **Symmetric Adaptive Decorrelation for I/Q Imbalance Compensation in Narrowband Receivers**, Kirei Botond Sandor, Marius Neag, Marina Dana Topa
9. **Estimation of the Noise Power in the NPVSS-NLMS Algorithm**, Radu Mihnea Udrea, Constantin Paleologu, Jacob Benesty, Silviu Ciochina
10. **Parallel Model for Spiking Neural Networks using Matlab**, Radu Mirsu, Virgil Tiponut

Room A116 16⁰⁰ – 19³⁰ ELECTRONIC CIRCUITS

Chairmen: Prof. Dr. Eng. Dorina Isar, Conf. Dr. Eng. Daniel Belega

1. **Improved Linearity CMOS Differential Amplifiers with Applications in VLSI Designs**, Cosmin Popa
2. **Enhanced Dual-Path Compensated Amplifier for Driving Large Capacitive Load**, Razvan-Gabriel Vieru, Romeo Ghinea, Liviu Goras

3. **An improved precision full-wave rectifier for low-level signal**, Slobodan Djukic, Milan Veskovic, Ana Vulovic
4. **Optimization of the Channel Filter in OFDM Radio Receivers by Using Genetic Algorithms**, Ioana Sărăcut, Victor Popescu, Marius Neag, Raul Onet, Stephen McDonagh
5. **A Time Multiplexed Programmable Array for Structured ASIC Technology**, Traian Tulbure
6. **Performance Gain from Data and Control Dependency Elimination in Embedded Processors**, Valeriu Codreanu, Radu Hobincu
7. **Variable gain amplifier building blocks based on MOSFET current dependence on the drain to source voltage**, Arcadie Cracan, Nicolae Cojan;
8. **First Generation Current Conveyor Macromodel**, Benjamin Dragoi

Friday, November 12th

Room A105 09⁰⁰ – 11⁰⁰ ELECTRONIC PACKAGING

Chairmen: Prof. Dr. Eng. Paul Svasta, Prof. Dr. Eng. Aurel Gontean

1. **PCBs with Different Core Materials Assembling in Vapor Phase Soldering Technology**, Ioan Plotog, Traian Cucu, Bogdan Mihailescu, Gaudentiu Varzaru, Paul Svasta
2. **Vapor Phase Soldering Technology Applications for PCB with Different Final Finishes**, Ioan Plotog, Traian Cucu, Bogdan Mihailescu, Gaudentiu Varzaru, Paul Svasta
3. **Multicriterial approach correlation of the solder joints functional tests results**, Ioan Plotog, Traian Cucu, Bogdan Mihailescu, Gaudentiu Varzaru, Paul Svasta
4. **VPS Control Module EMC Modeling and Evaluation**, Bogdan Mihailescu, Ioan Plotog, Paul Svasta, Marian Vladescu
5. **Solder Joints Mechanical Functionality Tested by Shear Forces Methodology**, Ioan Plotog, Traian Cucu, Gaudentiu Varzaru, Bogdan Mihailescu, Iulian Busu
6. **Electroluminescent lamps driver on compatible flexible substrates**, Ciprian Ionescu, Iulian Busu, Andreea Bonea, Norocel Codreanu, Paul Svasta

Room A116 09⁰⁰ – 13⁰⁰ IMAGE PROCESSING

Chairmen: Prof. Dr. Eng. Vasile GUI, Prof. Dr. Eng. Romulus Terebes

1. **Coherence enhancing image sharpening and denoising using a novel shock filter model**, Cosmin Ludusan, Olivier Lavalie, Romulus Terebes, Monica Borda
 2. **Advanced techniques in image processing - High dynamic range acquisition and shape recognition**, Sorin Ivascu, Corneliu Toma, Axel Gräser
 3. **Using PEG-LDPC Codes for object identification**, Wolfgang Pross, Franz Quint, Marius Ottesteanu
-

4. **Studying the Effectiveness of Using Linear Subspace Techniques to Improve SVM Classifiers in Facial Image Classification**, Nikolaos Tsapanos, Nikolaos Nikolaidis, Ioannis Pitas
5. **Target Detection Algorithm Validation for WSN**, Ruxandra-Ioana Rusnac, Aurel Stefan Gontean
6. **Some Experimental Results on Digital Interpolation for Body Surface Potential Maps**, Calin Simu, Eugen Marza
7. **Romanian language statistics and resources for text-to-speech systems**, Adriana Stan, Mircea Giurgiu
8. **Fast textural analysis method for aluminum detection in calcium aluminoferrite**, Muguras Mocofan, Mariana Suba
9. **An Efficient Hardware Implementation of H.264 TQ/IQT Module**, H. Loukil, A. Ben Atitallah, P. Kadionik, N. Masmoudi
10. **A parallel hardware architecture of deblocking filter in H264/AVC**, Moez Kthiri, Hassen Loukil, Ahmed Ben Atiltallah, Patrice Kadionik, Nouri Masmoudi

Room A106 09⁰⁰ – 13⁰⁰ COMMUNICATIONS 2

Chairmen: Prof. Dr. Eng. Mircea F. Vaida, Prof. Dr. Eng. Franz Quint

1. **A Secured Distributed Medical Application Endowed with Image Processing Facilities**, Cosmin Striletechi, Ligia D. Chiorean, Mircea F. Vaida
 2. **An Improved Opportunistic Packet Transmission Scheme for Wireless Sensor Networks**, Hakki Soy, Ozgur Ozdemir, Mehmet Bayrak
 3. **One methodological approach to the development of dynamic adaptation structures in network simulators**, Enio Kaljić, Mesud Hadžialić, Tarik Čaršimamović
 4. **Matlab Modeling and Analysis of the Signal Path in Zero-IF DVB-H Radio Receivers**, Raul ONET, Victor POPESCU, Marius NEAG, Ioana SARACUT, Marina TOPA
 5. **Multipath Interference Reduction Using Deconvolution in OCDMA Wireless Optical System**, Radu Lucaciu
 6. **Simulation and analysis of a Wi-Fi public network using the Radio Mobile software**, Bogdan Trandafir, Octavian Fratu, Simona Halunga
 7. **Parallel Turbo-TCM Schemes using Recursive Convolutional GF(2^N) Encoders over Frequency Non-Selective Fading Channel**, Calin Vladeanu, Adrian Florin Paun, Radu Lucaciu, Safwan El Assad
 8. **Performance evaluation of MRC systems in the presence of Nakagami-m fading and shadowing**, Petar Nikolić, Dragana Krstić, Mihajlo Stefanović, Stefan Panić, Fatih Destović
 9. **Performance of SIR-based Triple Selection Combining over Correlated Weibull Channel**, Zoran Popovic, Dragana Krstic, Nikola Sekulovic, Mihajlo Stefanovic
-

10. **DNA Repeats Detection Using Numerical Representations and Dot Plot Analysis**, Petre G. Pop, Alin Voina
11. **The ESPRIT algorithm. Variants and precision**, Arpad Iozsa, Andy Vesa
12. **Long-Range Dependence in WiMAX traffic. A Preliminary Analysis**, Cristina Stolojescu
13. **Vertical distribution of the RF signal inside a building, illuminated by a 3G mobile network base-station**, Adrian Mihaiuti, Alimpie Ignea
14. **An alternative strategy for grouping students in eLearning using an Enneagram methodology and eye tracking**, Florin-Claudiu Pop, Mircea-Florin Vaida, Marcel Cremene

6.2 Scientific Bulletin of the Politehnica University of Timisoara, Transactions on Electronics and Communications

*Scientific Bulletin of the "Politehnica" University of Timișoara
Transactions on Electronics and Telecommunications
Vol. 55 (69), No. 1, 2010, ISSN 1583-3380*

- Lucian Trifina, Daniela Tărniceriu, Ana Mirela Rotopănescu - Asymmetric Turbo Coded Modulation with Transmit and Receive Antenna Diversity*..... 3
- Abstract - This paper analyses the performances of turbo coded modulation with antenna diversity at transmission and reception, considering asymmetric turbo codes. We studied the cases when the component convolutional codes have memory 2 and 3, respectively, and their generator polynomials are both primitive and non-primitive. Simulations were performed to study these cases, considering both quasi-static and block fading, and the bit error rate (BER) and the frame error rate (FER) performances of asymmetric turbo coded modulation were evaluated. Based on this analysis, we note that primitive polynomials lead to better performances for FER, whereas the non-primitive ones lead to slightly improvements of BER in low SNR range.
- Keywords: *space-time modulation, antenna diversity, asymmetric turbo-codes*
- Radu Lucaciu, Adrian Mihaescu – Simulation Program for FIR Filter Approximation of Indoor Wireless Optical Channel* 8
- Abstract – In this paper we present a performance analysis for an optical code division multiple access (OCDMA) indoor wireless communication system. We described a method based on experimental measurements to obtain the impulse response of an indoor wireless optical channel. The impulse responses

used to calculate the system performance are obtained using a simulation program for FIR filters, program based on measured impulse response.

Keywords: *indoor optical wireless communication; OCDMA; interference reduction; FIR*

Andy Vesa – The Radiation Pattern for Uniform Array Antennas **13**

Abstract – In this paper are studied the radiation pattern of the uniform linear array antenna and the uniform planar array antenna respectively. Thus, have been modified the phase of the currents injected into the elements of linear array and planar array, and the number of elements of planar array respectively. All these changes are made in a program implemented on Matlab. Simulation results using different phases of the currents injected into antennas and different numbers of antenna elements are provided.

Keywords: *dipole antenna, uniform linear array antenna, planar array antenna*

Adrian Mihăiutu, Alimpie Ignea – Outdoor to Indoor Propagation - An Analysis of Location Variability at 2600MHz..... **17**

Abstract – The paper presents an analysis of the RF signal transmitted from an outdoor base station (BS), in order to find its spatial distribution for an indoor location, based on measurements data and a Matlab simulation developed by the authors.

Keywords: *indoor measurements, prediction*

Călin Simu - Interpolation Techniques Applied on Sparsely Sampled ECG Signals – part one: method and kernels **21**

Abstract – This paper presents the importance of electrocardiographic (ECG) signal interpolation. Also, a way to achieve ECG signals interpolation using cubic interpolation kernels is presented: principles of ECG signal interpolation and four kernels definitions are given. Finally, two examples are presented.

Keywords: *ECG, cubic interpolation, interpolation kernels*

Călin Simu – Interpolation Techniques Applied on Sparsely Sampled ECG Signals – part two: error evaluation **25**

Abstract – This paper presents an error evaluation for four cubic interpolation kernels, applied to sparsely sampled ECG signals. Four real ECG signals were tested and the following parameters were calculated and represented: absolute error, mean absolute error, root mean square error, and normalized root mean square error. For one step decimation / interpolation, Cubic Lagrange have best performances. For the presented situation, Cubic Convolution Interpolation Kernel have the same performances. Cubic Continual offers closer results. Cubic Spline have the worst results.

Keywords: *ECG, cubic interpolation kernels, errors*

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Vol. 55 (69), No. 2, 2010, ISSN 1583-3380*

- Aldo De Sabata, Ladislau Matekovits* – A New High Impedance Surface Featuring Several Electromagnetic Band-Gaps 3
- Abstract* – A high impedance surface featuring several electromagnetic band gaps is introduced. The surface is devised in microstrip technology and its properties are studied by electromagnetic simulation. We consider some variations of the geometry in order to extract information on the influence of geometrical elements on the position and width of the different frequency stop bands. We outline possible applications, including a switched surface or sensors.
- Keywords:* Microstrip, High Impedance Surface, Electromagnetic Band Gap, Electromagnetic Simulation.
- Adrian Leu, Dan Bacără, Ioan Jiveț* - Disparity Map Computation Speed Comparison for CPU, GPU and FPGA Implementations 7
- Abstract:* In this paper a comparison of the processing speed of the disparity map computation using a CPU, a GPU and an FPGA is presented. First the straightforward implementations of the block matching algorithm for the CPU and GPU are presented, followed by the newly developed architecture for FPGA implementation. The GPU used in this paper is an Nvidia Tesla C1060, programmed using the Nvidia CUDA API. The sum of absolute differences (SAD) has been chosen to compute the matching cost for the block matching algorithm, because of its simplicity, which facilitates a hardware implementation and makes the algorithm suitable for use in applications where a high frame rate is required. The last part of the paper presents a comparison between the processing speeds of the three considered devices.
- Keywords:* high speed disparity computation, SAD block matching algorithm, Tesla GPU, CUDA, FPGA implementation.
- Victor Moisa, Georgica Iacobescu, Ioan Jiveț* - A Real Time Stereo Disparity Architecture for FPGA/ASIC Implementation 13
- Abstract* - The paper presents an original architecture for real time stereo disparity computation. State of the art algorithms in recent reported implementations are analyzed in their adequacy to real time. For the selected SAD (sum of absolute differences) algorithm several improvements are proposed to enhance the disparity calculation. A fully pipelined design is disclosed and details of its implementation in a FPGA are presented. For the disparity computation module a weighting extension is proposed aiming to increase robustness to noise in the images. A post processing filter

implementation is also described. Details of VHDL coding and synthesis are not among the objectives of the paper and only an outline is given on its feasibility.

Keywords: real time stereo disparity calculation, SAD algorithm (sum of absolute differences) FPGA/ASIC implementation.

Nanu Sorin, Lie Ioan, Belgiu George, Muşuroi Sorin - High Speed Digital Controller Implemented with FPGA Board 17

Abstract - The purpose of the paper is to present a structure of digital control system where the programmed logic digital controller was replaced with a wired logic solution in order to drastic increase the computational speed. Two control systems were designed, implemented and experimented. The experimental results are presented within the paper.

Keywords: digital control system, wired logic, FPGA, sampling time, high speed.

Andrei Ternauciuc - e-Learning 2.0 at the "Politehnica" University of Timisoara 23

Abstract - Learning, as an educational process, has known a significant evolution along the recorded history. After immemorial times, there were the Greek and Roman schools of thought, then the monasteries of the Middle Ages, modern educational reforms after that, as well as countless intermediary stages. During the information age, computer aided learning appeared, which in turn transformed into what today we call e-Learning. With the emergence of the so called "social software", and the WEB 2.0 "revolution", this concept began evolving again. The tools that, at first, allowed regular users to easily create online content, started being used for pedagogical purposes, turning electronic learning (asynchronous, so far), into a two way street. This allows tutors to adapt their teaching style and content, in real time. The tools previously used for informal, social interactions, like the forum, blog, wiki, chat or even the humble email, become essential to the educational process, not only as means of socialization, but as vital instruments of learning.

Keywords: eLearning, web 2.0, blended learning.

6.3. Student Research Activities

Besides the teaching activities, our students are participated in students science competitions. In 2010, the faculty team, consist of Theodor-Adrian STANA, Horia SABU, Adrian MEŞTER, Gabriel-Tiberiu ZSURSZAN adviser: prof.dr.ing. Virgil TIPONUT and coach Paul HARFAS, won fifth place in the seventeenth edition of HARD and SOFT contest held at "Stefan cel Mare" University of Suceava. The 2010 edition was attended by 13 teams of four students' from 10 academic centers: Bucharest, Chernivtsky (Ukraine), Cluj-Napoca, Iaşi, Limoges (France), Novi-Sad

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(Serbia), Oradea, Sarajevo (Bosnia and Herzegovina), Suceava and Timisoara. More information you find out at: <http://hardandsoft.ro/html/2010.html>



The following graduation projects received maximum qualification:

Graduation projects

1. Beschiu Carmen - *Structuri de Procesare de semnal Implementate in FPGA*
2. Hegyi Szilard - *Model Experimental pentru Testare pe Frontiera*
3. Gabor Laurentiu, *Sistem de comunicatie wireless pentru un robot mobil hexapod.*

6.4 Social life

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

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

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

Our University, and the Library, too are connected to the Internet:

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

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

- one-room apartments,
- rooms with 4 beds, including bathrooms,
- rooms with 2 beds.

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

- The Students' House with several departments for different activities, artistic groups and a writers' club.
- The "Politehnica" Sport Association which always reached high sports performance.
- Two sports arenas with: tennis courts, basketball, football and handball grounds, gym, nautical and horse racing bases.
- Medical assistance is provided in a 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 on leisure opportunities offered by the town of Timișoara, please visit: <http://www.romaniatourism.com/timisoara.html>