Contents

1. General information

This booklet presents an overview of the activities taking place at the *Faculty of Electronics and Telecommunications* from the "Politehnica" University of Timişoara with special focus on the year 2007. 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 secretariats.
You can also find relevant information visiting our website:

http://www.etc.upt.ro

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

The late Prof. Remus Răduleţ, member of the Romanian Academy, introduced the study of **Electronics** at the "Politehnica" University of Timişoara 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.).

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 devote 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 OTEŞTEANU
- Vice Dean: Prof. dr. ing. Alimpie IGNEA
- Vice Dean: Prof. dr. ing. Aurel GONTEAN
- Scientific Secretary: Prof. dr. ing. Aldo DE SABATA

Faculty address:

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

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

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

Secretariat of the Applied Electronics (AE) Department:

- room B101,
- phone: +40-(0)256-403331;

Secretariat of Communications (COM) Department:

- room B201,
- phone: +40-(0)256-403301;

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

2.1. Applied Electronics Department

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Department board:

- Prof. dr. ing. Ivan BOGDANOV - Head of Department
- Prof. dr. ing. Mircea CIUGUDEAN
- Prof. dr. ing. Virgil TIPONUŢ
- Prof. dr. ing. Dan LASCU
- As. ing. Mircea BĂBĂIŢĂ

Staff

- Prof. dr. ing. Ivan BOGDANOV: Industrial Robots, Computer Control of Electrical Drives;
- Prof. dr. ing. Horia CÂRSTEA: Electronic Technology. Electronic Equipment Testing;
- 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 MUREŞAN: 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 TIPONUŢ: Analog Electronic Circuits. Programmable Logic Systems. Sensors and Transducers. Neural Networks;
- Conf. dr. ing. Dan ANDREICIUC: Industrial Robots. Mobile Robots;
- Conf. dr. ing. Ioan JIVEŢ: Design of ASIC (VLSI) Circuits. Design of Digital Systems with Microcontrollers and Microprocessors. Clinical applications of Electrical Bio-impedance. Tomography;
- Conf. dr. ing. Adrian POPOVICI: Industrial Electronics. Materials for Electronics;
- S.l. dr. ing. Cătălin CĂLEANU: Electronic Devices and Circuits;
- S.l. dr. ing. Lucian JURCA: Analog Electronic Circuits;
- S.l. dr. ing. Ioan LIE: Electronics. Doppler Telemetry;
- S.l. dr. ing. Valentin MARANESCU: Conception of Analog Integrated Circuits;

- S.l. dr. ing. Dan NEGOIŢESCU: Industrial Electronics. Power Factor Correction Circuits;
- As. ing. Mircea BĂBĂIŢĂ: Digital Circuits. Electrical Drives;
- As. ing. Marllene DĂNEŢI: DSP Applications. Statistical Signal Processing. Failure Diagnosis. Multimedia;
- As. ing. Beniamin DRĂGOI: Conception of Analog Integrated Circuits.
- As. ing. Aurel FILIP: Analog Electronic Circuits;
- As. ing. Petru PAPAZIAN: 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. Ioan NAFORNIŢĂ - Head of Department
- Prof. dr. ing. Corneliu TOMA
- Prof. dr. ing. Alexandru ISAR
- Conf. dr. ing. Florin ALEXA
- Conf. dr. ing. Eugen MÂRZA

Staff

- Prof. dr. ing. Andrei CÂMPEANU: 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 NAFORNIŢĂ: Signals, Circuits and Systems. Adaptive Signal Processing. Time-Frequency Representations. Applications of Wavelets Theory. Microwaves;
- Prof. dr. ing. Miranda NAFORNIŢĂ: Theory of Information and Coding. Data Transmission. Signals, Circuits and Systems. Modern Communications Networks;
- Prof. dr. ing. Marius OTEŞTEANU: Television. Telephone Transmission Systems. Information Recording Techniques;
- Prof. cons. dr. ing. Anton POLICEC: Biomedical Electronics. Radiocommunications;
- 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;
- Conf. 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. Lorin FORTUNA: Switching Systems for Telecommunications. Mail Traffic;
- Conf. dr. ing. Eugen MARZA: Radiocommunications. Mobile Radio. Radio Systems Engineering;
- S.l. dr. ing. Cornel BALINT: Switching Systems for Telecommunications;
- S.l. dr. ing. Muguraş MOCOFAN: Machine Vision and Pattern Recognition. Multimedia. Studio Equipment. Video Production;
- As. ing. Horia BALTĂ: Optical Transmission and Processing of Information. Statistical Theory of Information Transmission. Theory of Information and Coding;
- As. ing. Constantin M. BUCOS: Multimedia. Studio Equipment. Video Production;
- As. ing. Janos GAL: Signals, Circuits and Systems. Telecommunications Circuits;
- As. 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. Nicolae MICLĂU: Optical Transmission and Processing of Information. Theory of Information and Coding;
- As. ing. Corina NAFORNITA: Digital Signal Processing. Digital Watermarking;
- As. ing. Marius OLTEAN: Data Transmission on Radio Channels;
- As. ing. Mihai ONIŢA: Television. Audio and Video Compression. Streaming. Multimedia;
- As. ing. Marius SALAGEAN: Signals, Circuits and Systems;
- As. ing. Călin SIMU: Biomedical Electronics. Radiocommunications;
- As. ing. Andy VESA: Signals, Circuits and Systems. Mobile Radiocommunications;
- As. ing. Cristina STOLOJESCU: Digital Signal Processing.

2.3. Measurements and Optical Electronics Department

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- Prof. dr. ing. Liviu TOMA
- Prof. dr. ing. Dan STOICIU

Staff

- Prof. dr. ing. Mircea CHIVU: Electrical and Electronic Measurements. Measurement of Electrical and Non Electrical Quantities. Television Channels Broadcasted Via Satellite;
- Prof. cons. dr. ing. Sever CRIŞAN: Optical Electronics. Electronic Measurements, Sensors and Transducers;
- 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;
- Prof. dr. ing. Liviu TOMA: Data Acquisition Systems, Microprocessor Systems Architecture. Digital Processing Systems;
- 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;
- S.l. dr. ing. Septimiu MISCHIE: Electrical and Electronic Measurements. Programmable Measuring Systems. Precision Instrumentation;
- S.l. dr. ing. Adrian VÂRTOSU: Microwaves. Microwaves and Optoelectronics Measurements. Television Channels Broadcasted Via Satellite;
- As. ing. Emil LUZAN: Measurement of Environmental Factors. Measurement of Electrical and Non Electrical Quantities;
- As. dr. ing. Robert PASZITKA: Microprocessor Systems Architecture;
- As. ing. Ciprian DUGHIR: Electromagnetic Compatibility. Antenna Calibration;
- As. ing. Liliana STOICA: Electromagnetic Compatibility. Digital Processing Systems. Electronic Measuring Instruments;
- As. ing. Cora IFTODE, Electromagnetic Compatibility, Digital Processing Systems, Electronic Measuring Instruments;
- As. ing. Adrian MIHĂIUŢI, Antenna Calibration. Electromagnetic Compatibility. Digital Processing Systems;

Other employees: two technicians, one secretary and one computer operator.

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
2005/2006	377 for publicly funded places	280 publicly funded 39 self funded	7.29/10 5.04/10
2006/2007	356 for publicly funded places	295 publicly funded (76 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

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.

Number of students

2005/2006

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	313	53	192	34
Second year	AE + TC	237	54	149	17
Third year	AE	119	26	66	27
Fourth year	AE	103	22	61	20
Fifth year	AE	86	70	12	4
Third year	TC	119	22	61	36
Fourth year	TC	116	44	60	12
Fifth year	TC	108	78	24	6

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

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
2003/2004	AE	5.23 years
	TC	5.61 years
2004/2005	AE	5.87 years
	TC	5.57 years
2005/2006	AE	5.60 years
	TC	5.22 years
2006/2007	AE	5.78 years
	TC	5.49 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 (three 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 2007 - 2008

Before the introduction of the LMD system, the curriculum for the licensed engineer level had two cycles:

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

In 2006/2007, students from the fourth and fifth year have followed this system. The corresponding curriculum is presented below.

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

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

	Pack. 2	DSP Appl. In Power Electronics	Automatically Guided Vehicles	Graphical Programming	3	0	2	0	6
	Opt. 4*	Medical Electronics *** Neural Networks VLSI Circuits Design 2 Signal Processors Applications Fuzzy Systems			2	0	2	0	4
	Obl.	Practical Training 45 Hours							2

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

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

Fourth Year of Study for Communications (Second - cycle)

Sem.	Course Type	Course Title / Domain: Integrated Communications Systems	Communication Networks	Multimedia	Structure [hours/week] C	S	L	P	Credit Points
	Comp.	Digital Processing Structures			2	0	2	1	6
	Comp.	Data Communications Networks			3	0	2	0	6
	Comp.	Thelephony Transmission 1			3	0	2	1	6
	Comp.	Radio-Communications 1			3	0	2	1	6
	Opt 3*	Management; Marketing ***			1	1	0	0	4
	Comp.	Practical Training							2

	Comp.	Television			3	0	2	0	5
	Comp.	Digitally Switching Systems			3	0	2	0	5
	Comp.	Optical Communications 1			2	0	1	1	6
	Pack. 1	Integrated Digital Networks	Integrated Digital Networks	Multimedia Production	3	0	2	0	4
	Pack. 2	Radio-Communications 2	Communications Protocols	Graphics And Image Processing	3	0	2	0	4
	Optional 4*	Power Electronics For Telecommunications *** Object Oriented Programming			2	0	2	0	4
	Comp.	Practical Training 45 Hours							2

* Either a course from the recommended list or a course ("Compulsory", "Optional" or "Pack") from the same study year from another direction will be chosen.
** A course from the recommended list will be chosen.
*** Coll.

Fifth Year of Study for Communications (Second - cycle)

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

* Either a course from the recommended list or a course ("Compulsory", "Optional" or "Pack") from the same study year from another direction will be chosen.
** A course from the recommended list will be chosen.
*** Coll.
Note: As far as assessment practice is concerned, (E) means examination and (C) means continuous assessment

As mentioned above, in 2005 a new curriculum has been introduced, for the License-Master-Doctorate system, according to the Bologna Declaration. The License level curriculum has been designed and, at this moment, it is studied by students from the first, second and third year. This curriculum is detailed below.

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

Second Year - Fourth Semester							
1	Microeconomics	2	1				4
2	Signal Processing	2		2			5
3	High Frequency Techniques	2	1	1			4
4	Processor Based on 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

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
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 – in English Language

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
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
	Practical Training					C	2
	Total	13	8	7		28	31

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

Field: Electronic Engineering and Telecommunications – in English Language

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	4
6	Microprocessors and Microcontrollers	2		2		E	4
7	Engineering Ethics and Communications	1	1			DE	2
8	Electronic Circuits Project				2	DE	2
9	Physical Education		1			DE	1
10	Practical Training					C	2
	Total	13	2	9	2	26	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;
- one-year period of study (extended to 2 years starting from 2006 and for the LMD system);
- the students (young engineers) graduate this level with a dissertation.

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

- **Applied Electronics:**
  - ***"Electronics of Intelligent Industrial Systems" (EIIS)***,
  - ***"Advanced Design and Testing Techniques in Electronics" (ADTTE).***
- **Communications:**
  - ***"Signal Processing in Telecommunications Networks" (SPTN)***
  - ***"Traitement du Signal"*** (Signal processing), in French ***(TS)***
- **Measurement and Optical Electronics:**
  - ***"Electronic Instrumentation"(EI)***

Number of students 2006/2007

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

Number of students 2007/2008

	Total number	Graduated	Withdrawn
EIIS	18	-	
SPTN	16	-	
TS	15	-	
ADTTE	16	-	
EI		-	

Curriculum for the Academic Year 2006-2007

Electronics of Intelligent Industrial Systems

Sem.	Course Title	Structure [hours/week]				Credit points
		C	S	L	P	
I	Fuzzy Systems. Applications in Automatic Control	2	0	0	1	8
	Neural Networks Applications	2	0	0	1	8
	Functional Parameters Optimization of Energy Conversion Electronic Systems	2	0	0	1	8
	Computer Aided Design of Application Oriented Integrated Circuits	1	0	0	2	6
II	Statistical Signal Processing	2	0	2	0	10
	High Frequency Power Processors. Analysis and Modelling	2	0	1	1	10
	Real Time Systems	2	0	1	1	10
III	Design and Testing of Embedded Systems	2	0	0	1	8
	Algorithms and Techniques for Modelling and Simulation	1	0	1	1	8
	Power Active Filters with High Reliability	2	0	1	0	8
		2	0	1	0	6
IV	Elaboration of the M.Sc. Thesis					30

Signal Processing in Telecommunications Networks

Sem.	Course Title	Structure [hours/week]				Credit points
		C	S	L	P	
I	Advanced Techniques in Telecommunications Networks	2	0	2	0	11
	Detection and Estimation in Radiolocation	2	0	2	0	11
	Image Processing	2	0	2	0	8
II	Data, Voice and Image Network Communications	2	0	2	0	10
	Statistic Signal Processing	2	0	2	0	10
	Mobility and Security in Radio Networks	2	0	2	0	10

III	Multimedia Signal Processing	2	0	2	0	11
	Advanced Techniques in Telecommunications	2	0	2	0	11
	Biomedical Signal Processing	2	0	2	0	8
IV	Elaboration of the M.Sc. Thesis					30

Electronic Instrumentation

Sem.	Course Title	Structure [hours/week]				Credit points
		C	S	L	P	
I	Optoelectronics and High Frequency Instrumentation	2	0	1	0	7
	Biomedical Signal Processing	2	0	1	0	8
	Measurements in Radio-frequency	2	0	2	0	8
	Advanced Techniques in Measurement	1	0	1	0	7
II	Test and Measurement Interfacing Systems	2	0	2	0	10
	Statistical Signal Processing	2	0	2	0	10
	Virtual Instrumentation	2	0	0	2	10
III	Algorithms and Techniques for Modelling and Simulation	1	0	1	1	8
	Image Processing	2	0	2	0	8
	Spectral Analysis	2	0	1	0	8
	Management of Design and Research	1	1	0	0	6
IV	Elaboration of the M.Sc. Thesis					30

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

Sem.	Course Title	Structure [hours/week]				Credit points
		C	S	L	P	
I	Mathematical Morphology	2	0	2	0	10
	Adaptive Signal Processing	2	0	2	0	12
	Image Processing	2	0	2	0	8
I	Statistical Signal Processing	2	0	2	0	10
	Wavelet Functions Theory	2	0	2	0	10
	Time-Frequency Representations	2	0	2	0	10
III	Modern Telecommunications Techniques	2	0	2	0	8
	Neural Networks Applications	2	0	2	0	11
	Biomedical Signal Processing	2	0	2	0	11
IV	Elaboration of the M.Sc. Thesis					30

Advanced Design and Testing Techniques in Electronics

Sem.	Course Title	Structure [hours/week]				Credit points
		C	S	L	P	
I	PCBA Design and Manufacturing	1	0	2	0	8
	Radio-Frequency Measurements	2	0	2	0	8
	Modern Programming Techniques	1	0	1	0	6
	Digital Communications	2	0	1	0	8
II	Test and Measurement Interfacing Systems	2	0	2	0	8
	Statistical Methods for Process Control	2	0	2	0	8
	Virtual Instrumentation					10
	PCBA Design and Manufacturing (project)	0	0	0	2	4
III	Algorithms and Techniques for Modelling and Simulation	1	0	1	1	8
	Design and Testing of Embedded Systems	2	0	1	1	8
	Electromagnetic Compatibility	2	0	1	0	8
	Management of Design and Research	1	1	0	0	6
IV	Elaboration of the M.Sc. Thesis					30

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-tutelary 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. ing. Virgil TIPONUŢ*

PhD students

- Ciprian GAVRINCEA: *Researches On A Neural Network Implementation For Processing Signals Generated By The Muscle System*
- Alexandru DARIE: *Optimizing the Performance of a Mobile Robot Society*
- Liviu LUCACIU: *Contributions To Biometric Systems Development And Implementation*
- Marian BURSAŞIU: *Contributions To The Optimization Of Neural Network Applications Development.*
- Alin BRÎNDUŞESCU: *Contributions To The Biological Signals Simulation Using Artificial Neural Networks*
- Ionuţ MIREL: *Methods For Digital Video Images Processing*
- Călin LAR: *Contributions To Sensorial Data Fusion*
- Sorin POPESCU: *Optimization Of The Electrical Welding Process By Means Of Artificial Neural Networks*
- Laviniu ŢEPELEA: *Human-Machine Interface.*
- Lucian BUGLEA: *Smart Transducers Array*
- Philipp ROEBROCK: *Multi Sensor Controlled Assembly And Application With Manipulators*
- Ioan GAVRILUŢ: *Contributions To Autonomous Mobile Robot Navigation Using CNN*
- *Daniel IANCHIS*
- *Zoltan HARASZY*

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

PhD students

- Petru PAPAZIAN: *Intelligent Subsystems For Optimal Control Of Technological Processes*
- Solomon MIMIS: *Integrated Circuits for Transmission Bit Error Rate Measurement*
- Dan Mircea ANDREICIUC: *Analysis And Correction Methods For Positioning And Orientation Of Mobile Industrial Robots*
- Sebastian TIPONUŢ: *Researches Regarding The Implementation Of Embedded Systems Using Predefined Templates*

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

PhD students

- Aurel FILIP: *Researches On CMOS Frequency References*
- Marllene DANEŢI: *Propagation Time Estimation Algorithms For Noise Sources Location*
- Beniamin DRAGOI: *Researches On CMOS Integrated Digital Correlator Conception And Design*
- Radu MIHAESCU: *Telecommunications-Systems Integrated Optimum Structures Based On Mobile Cellular Automatic Devices*
- Iosif MUDRA: *Researches On CMOS Integrated Fast Synchronous Comparators*
- Bogdan MARINCA: *Ultrasonic Investigation Optimization By Algorithms Implemented In Dedicated Integrated Circuits.*

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

PhD students

- Mircea BĂBĂIŢĂ: *Reaserches On AC–DC Converters*
- Cornel GLISICI: *Contributions Regarding Improved Capabilities Of Uninterruptible Power Supplies*
- Corina IVAN: *Energy Parameters Optimization In DC-DC Converters*
- Marin TOMŞE: *Contributions To Theoretical And Experimental Studies Of Inductive Heating Power Supplies*
- Daniel ALBU: *Contributions Regarding Improved Capabilities Of Switched Mode Converters With PFC Applications*
- Dorin CIZMAŞIU: *Power Factor Control In AC-DC Conversion Systems*
- Lucian PĂUN: *DC-DC Converters With Optimized Energy Parameters*
- Adrian ŞCHIOP: *Contributions To Theoretical And Experimental Studies Of Power Converters With AC Motor Drive Applications*
- Cristian VRÂNCILĂ: *Theoretical And Experimental Contributions Regarding Active Power Filters*

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

PhD students

- Dumitru MĂRGELOIU: *Contributions To The Improvement Of Electronic Equipment For Monitoring And Control Of Low And Medium Voltage Power Grid Parameters*
- Ovidiu MIŢARIU: *Contributions To The Improvement Of Auto Testing Equipment In Digital Data Conditioning And Transmission*
- Corneliu TRIPA: *Contributions To The Development Of Fault Diagnose And Identification Tests In Applied Electronics Equipment*
- Mircea RIF: *Automated System For Data Acquisition, Processing And Management In Industry*
- Mircea MIHĂESCU: *Contributions To The Development Of Dynamical Diagnose And Reconfiguration Tests In Digital Fault Redundant Systems*
- Liviu ION: *Contributions To The Development Of Digital Regulation In Electrically Driven Industrial Processes*
- Andy BERCOVICI: *Contributions To The Increase Of Reliability In Digital Electronics Equipment*

- Cornel GLĂVAN: *Contributions To Increased Security Of Digital Transmissions In Special Applications*
- Liviu CHIŞ: *Contributions To Pattern Recognition Test Development In Automated Visual Control*
- Călin SÂRBU: *Contributions To Predictive Test Development Concerning Electrostatic Discharge In Electronic Industry*

6. Scientific supervisor: *Prof. dr. ing. Ioan NAFORNIŢĂ*

PhD students

- Mirela BIANU: *Contributions On Adaptive Signal Processing In Telecommunications*
- Ciprian DAVID: *Contributions On Fault Detection Using Image Processing Techniques*
- Cristian IGNEA, *Contributions* on *finding and measurement antenna parameters*
- Adrian FILIPESCU, *Contributions on Digital Filters Optimal Design*
- Romulus REIS: *Non-Stationary Signal Description By Non-Parametrical Methods*
- Janos GAL: *Contributions On The Use Of Kalman Filters In Telecommunications*
- Marius SALAGEAN: *Non-Stationary Signal Description By Non-Parametrical Methods*
- Florin VANCEA: *Data Protection In Communication Networks*
- Andy VESA: *Improvement Of Digital Radio Systems Detection*
- Mircea COSER: *Systems Optimization Using TRIZ Techniques*
- Teodora PELA: *Traffic Optimization On Metropolitan Area Networks*
- Adina DABA: *Non-Stationary Signal Description By Non-Parametrical Methods*
- Florin Dumitru CHIS: *Improving Security Level In Broadband Networks*
- Arpad IOZSA
- Mirela MIOC

7. Scientific supervisor: *Prof. dr. ing. Miranda NAFORNIŢĂ*

PhD students

- Horia BALTA: *Hierarchical Coding For Spread Spectrum Transmission Systems*
- Radu LUCACIU: *Optical Communication Systems With OCDMA*
- Maria KOVACI: *N-PSK Multi-Resolution Modulations In The COFDM Hierarchical Systems*
- Caius ULITA, *Equalizers for radio channel modems*
- Mirela VIOR: *Quality Transmission Improvement Using Turbo Codes*
- Sorin POPA: *Synchronization Techniques Improvement For Radio Channel Transmission Systems*
- Marius OLTEAN: *Radio Channel Equalization Using Cyclic Prefix*
- Florin Lucian MORGOS: *Radio Channels Equalization Techniques Improvement*

8. Scientific supervisor: *Prof. dr. ing. Alexandru ISAR*

PhD students

- Ioana FIROIU (ADAM): *De-Speckling Of Sonar Images By Multi-Resolution Filtering*
- Cristina STOLOJESCU
- Mircea BORA: *The Signal To Noise Ratio Enhancement In Communications Systems Using Wavelets*

9. Scientific supervisor: *Prof. dr. ing. Corneliu I. TOMA*

PhD students

- Ionel STANCIU: *Multimedia Communications Over Wireless Networks*
- Andreea GĂLEANU: *Contributions To Performance Improvement Of The GSM System*
- Artur MULLER: *Contributions In Implementing Multimedia Databases, With Local And Remote Access*
- Mirela IOANEŞIU: *Contributions To Network Security By Using Virtual Private Networks (VPN)*
- Daniel C. HAIDUC: *Contributions In The Colour Digital Reproduction Field*
- Constantin M. BUCOS: *Modeling And Analysis Of Mobile Virtual Organizations*
- Radu TĂNASE: *Ultrasound Electronic Systems For Movement Evaluation In The Fluid Environment*
- Mihai I. ONIŢĂ: *Video Communications In Multimedia Applications*
- Mircea TOMOROGA: *Contributions To Conception And Design Of Analogue Integrated Circuits In CMOS Technology*
- Florin-Josef LĂTĂREŢU: *Contributions To Intelligent Telecommunications Network Achievement*
- Daniela Narcisa FUIOREA – BULUCEA
- Alin SCOROŞANU

10. Scientific supervisor: *Prof. dr. ing. Marius OTEŞTEANU*

PhD students

- Sandra RUGINĂ
- Georgiana SÂRBU-DOAGĂ
- Hay BOENKE
- Daniel POPA

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

PhD students

- Iasmina ERMALAI: *Contributions To The Use Of New Information Technologies In e-Learning*
- Constantin M. BUCOS: *Modelling and analysis of mobile virtual organizations*
- Mihai I. ONIŢĂ: *Video communications in multimedia applications*
- Artur SRAUM: *Contributions To Interactive Web Programming*
- Cristian TECU: *Contributions To The Use Of Video, Photo And Audio Applications In Professional Presentations*

- Andrei TERNAUCIUC
- Virgil ROTARU
- Bogdan DRĂGULESCU, first year student

12. Scientific supervisor: *Prof. dr. ing. Sever CRIŞAN*

PhD students

- Octavian LUCA: *Spectral Analysis Of Bioelectrical Signals*
- Ovidiu VETREŞ: *Perturbations Study Of Low Frequency Electromagnetic Fields*

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

PhD students

- Liliana STOICA: *Contributions To Digital Signal Processing*
- Ciprian DUGHIR: *Contributions To Antenna Calibration*
- Cristina VĂLIU: *Contributions To The Nonlinearities Study Of High-Frequency Circuits*
- Cora IFTODE: *Electromagnetic Field Effects On Living Organisms*
- Gabriel GĂŞPĂRESC: *Perturbation Monitoring In Electrical Networks*
- Adrian MIHĂIUŢI: *Contributions To Antenna Calibration*
- Doru Lucian COCOŞ: *Neural Networks And Fuzzy Logic Applications To Electronic Meter Calibration*
- Teodor PETRIŢA, *Contributions to radiofrequency disturbances monitoring*
- Raul IONEL: *Algorithms For Noise Sources Detection Using Virtual Instrumentation*
- Michael KLEINKES (Germany): *Mathematical Analysis Of Off-Line Programmed Robots In Industrial Application Cells Monitoring*
- Tudor-Marius ZIMAN
- Alexandru-Vlad DEHELEAN

PHD THESIS DEFENDED

1. Ioan GAVRILUT: *Contributions To Autonomous Mobile Robots Navigation Using Cellular Neural Networks*, PhD supervisor *Prof. dr. ing. Virgil TIPONUT*

2. Adrian-Lazar SCHIOP: *Contributions To Theoretical And Experimental Studies Of Power Converters With AC Motor Drive Applications*, PhD supervisor *Prof. dr. ing. Viorel POPESCU*

3. Constantin M. BUCOS: *Development Of Information Systems For e-Learning And For The Realisation Of Virtual Educational Organisations*, PhD supervisor *Prof. dr. ing. Corneliu I. TOMA* and *Prof. dr. ing. Radu VASIU*

DOCTORAL PREPARATION ESSAYS

- Janos GAL: *Kalman Filtering*, PhD Advisor *Prof. dr. ing. Ioan NAFORNIŢĂ*

- Romulus REIS: *Use Of Time-Frequency Representations For Non-Stationary Signal Description*, PhD supervisor *Prof. dr. ing. Ioan NAFORNIŢĂ*

- Sorin POPA: *Radio Transmission Systems Synchronization Methods*, PhD supervisor *Prof. dr. ing. Miranda NAFORNIŢĂ*

- Florin Lucian MORGOS: *Radio Channels*, PhD supervisor *Prof. dr. ing. Miranda NAFORNIŢĂ*

- Radu LUCACIU: *Optical Systems With OCDMA Performance Analysis*, PhD supervisor *Prof. dr. ing. Miranda NAFORNIŢĂ*

- Horia BALTĂ: *Contributions On Turbo-Binary And Non-Binary Codes Development*, PhD supervisor *Prof. dr. ing. Miranda NAFORNIŢĂ*

- Mirela MIOC: *Analysis Of Using Some Sequential Linear And Cyclic Schemes*, PhD supervisor *Prof. dr. ing. Ioan NAFORNIŢĂ*

- Gheorghe Daniel POPA: *Nonparametric Estimation Techniques,* PhD supervisor *Prof. dr. ing. Marius OTEŞTEANU*

- Gheorghe Daniel POPA: *Robust Methods In Video Tracking,* PhD supervisor *Prof. dr. ing. Marius OTEŞTEANU*

- Mihai I. ONIŢĂ, *Mobile telephony and internet networks streaming technology*, PhD advisors: Prof. dr.eng. Corneliu TOMA, prof.dr.eng. Radu VASIU

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

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

- Mirela L. IOANEŞIU, *VoIP service extension using adaptive personal mobile communication*, PhD advisor: Prof. dr. eng. Corneliu TOMA

- Sandra RUGINĂ, *Analysis, Modelling and Measuring Rain Characteristics*, PhD advisor: Prof. dr. eng. Marius OTESTEANU

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

- Sandra RUGINĂ, *Software Environment for the Laster Precipitation Monitor*, PhD advisor: Prof. dr. eng. Marius OTESTEANU

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

- Iasmina ERMALAI: *Contributions To The Use Of New Information Technologies In e-Learning,* PhD supervisor *Prof. dr. ing. Radu VASIU*

- Iasmina ERMALAI, *The Use of PDAs in the Actual Generation of M-learning Environments*, PhD advisor: prof. dr. eng. Radu VASIU

- Daniela FUIOREA: *Using Correspondence Algorithm For Localisation Of Points From Wireless Network Sensors*, PhD supervisor *Prof. dr. ing. Corneliu I. TOMA*

- Cristian ŢECU: *Contributions To Use New Technologies In Digital Presentation,* PhD supervisor *Prof. dr. ing. Radu VASIU*

- Cristian TECU, *Definition of a Software Application to Control the Use of Video, Photo and Audio Applications in Professional Presentations*, PhD advisor: prof. dr. eng. Radu VASIU

- Constantin M. BUCOS: *Development Of Information Systems For e-Learning And For The Realisation Of Virtual Educational Organisations*, PhD supervisor *Prof. dr. ing. Corneliu I. TOMA* and *Prof. dr. ing. Radu VASIU*

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

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

- Andrei TERNAUCIUC, *Interoperability and Portability between Different eLearning Platform*, PhD advisor: prof. dr. eng. Radu VASIU

- Raul IONEL: *Increase In Precision Localisation By Widening Filters Uses,* PhD supervisor *Prof. dr. ing. 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.
Web page: http://www.etc.upt.ro/ea
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

INTERNATIONAL PROGRAMMES

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

Programme:	EU Sixth Framework Programme FP6- 017146, 2007
Total value:	1,000,000 EURO (35,000 EURO for UPT, 4,000 EURO for ETc).
Director:	Prof. dr. ing. Ivan BOGDANOV
Members:	Prof. dr. ing. Tiberiu MURESAN Prof. dr. ing. Virgil TIPONUT Prof. dr. ing. Vasile GUI Prof. dr. ing. Alimpie IGNEA Prof. dr. ing. Dan STOICIU

S.l. dr. ing. Cătălin CĂLEANU
As. ing. Dan ANDREICIUC

Partners:
1. Fraunhofer Gesellschaft, Germany
2. Asentics GmbH & Co.KG, Germany
3. ABB Automation Technologies AB, Germany
4. Sick AG, Germany
5. Inos Hellas SA, Greece
6. Lunds Universitet, Sweden
7. "Politehnica" University of Timişoara, Romania
8. S.C. Robcon SRL, Romania

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

FIELD AND PROJECT DESCRIPTION

The project focuses on the novel concept of "skill-based manufacturing", i.e. production units, with embedded knowledge about their skills, being able to interact so as to solve a given manufacturing task. Given the situation of the existing highly automated manufacturing systems, the automate design and/or the reconfiguration of the known manufacturing systems have to be achieved.

ACTIVITIES AND RESULTS

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

RESEARCH PROJECTS

1. CNCSIS grant A, nr. 639
Integrated environment for assisted movement of visually impaired persons

Total value: 30,000 RON
Director: Prof. dr. ing. Virgil TIPONUT
Members: Prof. dr. ing. Alexandru GACSADI
Conf. dr. ing. Stefan ONIGA
S.l. ing. Calin LAR
S.l. ing. Ioan GAVRILUT
S.l. ing. Ciprian GAVRINCEA
As. ing. Laviniu TEPELEA

FIELD AND PROJECT DESCRIPTION

The project focuses on an integrated environment that improves the mobility of blind persons within a limited area. The proposed solution includes two types of equipment: -
- wearable equipment, placed on the subject, which guides the blind user in order to navigate autonomously, enabling him or her to avoid obstacles;
- stationary equipment, which supervises the motion, enabling the blind user to avoid some unexpected events.

ACTIVITIES AND RESULTS

This year, the research activity within the project has been focused in the following main areas of interest:

- Development of a sensorial module capable to provide information on the presence and position of obstacles in front of the subject; the same unit is responsible for the attitude of the blind person (the position of the head in both horizontal and vertical planes);
- Development of the supervising system, which monitors the position of the subject in his/her movement to reach the target;
- Research and experiments in order to develop a simple and efficient man-machine interface that should allow the communication between the subject and the electronic system.

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

2. CNCSIS grant A, nr. 2739/ 23.05.2007, theme 8, CNCSIS code 351

Image quality improvement in sonar systems by speckle noise reduction

Total value:	9,500 RON
Director:	Conf. dr. ing. Dorina ISAR
Members:	Prof. dr. ing. Sabin IONEL
	Prof. dr. ing. Andrei CÂMPEANU
	Prof. dr. ing. Alexandru ISAR
	S.l. dr. ing. Cornel BALINT
	As. ing. Sorin POPESCU
	As. ing. Maria KOVACI
	As. ing. Andy VESA
	As. ing. Marius SĂLĂGEAN
	PhD stud. Ioana ADAM
	PhD stud. Mircea BORA

FIELD AND PROJECT DESCRIPTION

The images obtained using a set of sound or ultrasound transducers such the SAR images used in aerial navigation or the sea floor images acquired with sonar or the echo graphic images are perturbed by a multiplicative acquisition noise, called speckle noise. For the correct interpretation of the information contained in these images, the enhancement of the quality of those images, based on the rejection of the speckle noise is required. For this purpose the wavelets theory is used more often today. An algorithm dedicated to the reduction of the speckle noise has the following steps: the speckle noise

is transformed into an additive noise by the computation of the logarithm of the acquired image; the discrete wavelet transform of the obtained result is then computed; then the non-linear filtering of the new result is performed, reducing the noise; the inverse discrete wavelet transform is then computed and the anti-logarithm of the new result is computed. So, the noise-free estimation of the acquired image is obtained. The purpose of our grant submission is to match this de-noising algorithm to the specificities of the sea floor images acquired with sonar images: the statistics of the information contained, the statistics of the speckle noise, the time required for acquisition. The results obtained will be used for the realization of certain computing programmes dedicated to the use of geologists for the interpretation of sea floor images, to study the tectonic changes, to appreciate the age of different earth components, the relief modifications tendencies or to control different regions for ecology or military purposes. The performance of those programmes will be superior to the performance of the programmes already conceived, affecting less the statistics of the useful image contained into the images to be processed, being faster and using less memory.

ACTIVITIES AND RESULTS

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

"I. Adam, M. Oltean, M. Bora, *A New Quasi Shift Invariant Non-Redundant Complex Wavelet Transform,* Proceedings of International ETc Symposium 2006, September 21-22, 2006, Timişoara".

Research in *NEURAL COMPUTING AND INTELLIGENT SENSORS*

The research group is coordinated by Prof. dr. ing. Virgil TIPONUŢ 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 PROJECTS

1. *CNCSIS grant AT MEdC, AT41, nr. 2739/ 19.06.2007 C SHARP/DOT NET Implementation for a Facial Detection and Recognition Neural System.*

Value: 20,000 RON
Director: Lect.dr.eng. Cătălin-Daniel Căleanu
Members: Lect.dr.eng. Muguraş Mocofan
Lect. dr. eng. Adrian Avram
Assist.eng. Valentin Maranescu
Caciora Radu, student
Adrian Harea, student

FIELD AND GRANT DESCRIPTION

The aim of this project is to develop a system for automatic face detection and recognition using a new and powerful programming language and technology, namely C Sharp and DOT NET. It is based on one of the most promising Artificial

Intelligence's paradigm – Neural Networks, combined with advanced digital image processing techniques, e.g. Gabor filters. The motivations underlying chosen software are in relation with the need of a real time operation mode and a versatile implementation of the following stages required by above mentioned system: interfacing videocapturing devices and manipulate video streams; image acquisition and theirs Internet broadcasting; image processing; object oriented neural networks implementation; Internet services; create/access/maintain multimedia databases. Among applications of such facial detection and recognition system, are: continue monitoring of public places, e.g. rail stations, airports, in order to locate certain individuals, searching large mug shot databases, sensitive areas access control, etc.

ACTIVITIES AND RESULTS

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

1. C.D. Căleanu, C. Botoca, "*C++ Solutions for a Face Detection and Recognition System*", FACTA UNIVERSITATIS, Ser. Elec. Energ., Nis, Yugoslavia, 2006
2. C.D. Căleanu, V. Gui, F. Alexa, "*Face Recognition via Direct Search Optimized Gabor Filters*", 5th WSEAS International Conference on System Science and Simulation in Engineering, (ICOSSE'06) Tenerife, Canary Islands, Spain, December 16-18, 2006
3. C.D. Căleanu, V. Gui, F. Alexa, "*Direct Search Optimized Feature Extraction*", WSEAS Transactions on Systems and Control, 2006

All above mentioned papers have been accepted for publishing. The following paper was proposed for publishing into a Romanian Academy journal and is still currently under evaluation:
C.D. Căleanu, G. Pradel, V. Maranescu, F. Alexa, "*Combined Pattern Search Optimization of Feature Extraction and Classification Parameters in Facial Recognition*", Romanian Journal of Information Science and Technology, 2006

RESEARCH TEAM

Prof. dr. ing. Alexandru GACSADY
S.l. dr. ing. Catalin CALEANU
S.l. ing. Aurel FILIP
S.l. ing. Calin LAR
S.l. ing. Ioan GAVRILUT
As. ing. 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.

INTERNATIONAL PROGRAMMES AND GRANTS

1. LEONARDO DA VINCI Community Vocational Training Action Programme

Title:	*E-learning, Distance Interactive Practical Education (EDIPE)* CZ/06/B/PP-168022
Total value:	25,000 EURO
Director:	Prof. dr. ing. Dan LASCU
Research Team Members:	Prof. dr. ing. Viorel POPESCU- head of the group Conf. dr. ing. Mihaela LASCU Conf. dr. ing. Adrian POPOVICI S.l. dr. ing. Dan NEGOIȚESCU S.l. dr. ing. Adrian POPOVICI As. ing. Mircea BĂBĂIȚĂ
Partners:	Technical University of Brno, SK Technische Universiteit Delft, NL Technische Universität Wien, AT Institut für Elektrische Antriebe und Maschinen, Wien, AT Ruhr Universität Bochum, DE National Technical University of Athens, GR Institut National Polytechnique de Lorraine, FR Budapest Muszaki es Gazdasagtudomanyi Egyetem, HU Fakulta elektrotechniky a informatiky Technická univerzita V Košiciach, SK

Trencianska Univerzita Alexandra Dubceka v Trencine, SK
University of Maribor FERI, SL
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FIELD AND PROJECT DESCRIPTION

So far, the e-learning or distance-learning via the Internet is focusing on delivery of information, where typically multimedia rich web pages are offered to the student sitting at home, in front of the computer, taking lessons on a certain subject, while keeping contact with other students and teachers by means of e-mail, chat-rooms, on-line tests, etc.

Other issues focus on different teaching styles under the influence of extensive usage of multi-media means of communication like video clips, audio or "slide shows" either in the real classroom or in a virtual classroom (Internet). Advanced teaching materials combine text documents that explain the theoretical aspects of the issues to be taught, with interactive programmes that allow the students to do small experiments using a simulator or to solve some engineering problems. The rapid changes in society and technology have also generated a demand for more flexible engineers having more qualifications than just a high level of technical or scientific specialisation. The drawback of a pure theoretical approach in the undergraduate electrical engineering (EE) curriculum is that less attention is paid to the phenomena that threaten the laboratory experiments and the exploration of system components. The result of this, in combination with the rapid development of computer applications, is that hands-on and the laboratory experience is vanishing being replaced with computer simulations which get more and more attention.
However, it is crucial to let students have some real practice. The real experiment gives the students a sense of practical testing and they can also see the influence of the second/higher order effects, real time effects, effect of parasits which are difficult or impossible to be simulated perfectly. The reason is that the simulation is always based on more or less simplified models. Therefore, it is important to give real world experience to the students.
But to build an experiment is expensive and it is impossible for an educational institute to have the complete scale of experiments. From the learner's point of view, there is a need for easily accessible hardware experiment. The hardware experiment should therefore be redesigned in such a way that they could also be accessed on the Web. Thus, the advance in ICT will be combined with the real practical experience.
The proposed virtual or distance laboratory does not present any web-based simulation. It is a real electro-technical experiment conducted in the laboratory but accessed remotely, controlled and monitored by web-based tools. The experiment is conducted

either online or it is based on recorded values (virtual experiment). It allows students to perform the experiment safely, without guidance, and official working hours in the laboratory are not limiting the users. The students can also experience the appearance of the measurement instrument, the electronic components and many more factors such as layout. The facility is useful for today's requirement of teaching in the Internet.
The experiments should be not only analysis oriented (to measure and see the results) but also synthesis oriented. They should involve a design aspect. Therefore, the measurements are designed as a project with educational philosophy. The technology of such integration is planned to be achieved within the framework of the project. First of all the technology and the guidelines to achieve Distance Interactive Practical Education will be defined. With this new e-learning tool, the technology will be used with the basic fields of applied electrical engineering starting from fundamentals of EE, through electronics, power electronics, applications of power electronics, dynamics of electro-mechanical systems, including industrial application of electrical drives, motion control and also complex drive systems will be addressed. A complete set of 18 different interactive design oriented virtual or distance laboratories will be prepared with the active participation of the educational expert. This technology will enable us to transfer results from different sectors of education and it will revolutionize education as it is understood today.

During the onset meeting held in Vienna on November 30th-December 1st, the project web page, evaluation group, dissemination plan, financial management, contents of the materials, selection of software for distance management of the practical sessions and a workshop on profact oriented and design oriented education were established.

Research in *ELECTRONIC PACKAGING AND TESTING*

The research group in this domain is coordinated by Prof. dr. ing. Horia CÂRSTEA, and includes two assistants and three graduated students. The group established relationships with several regional powerful companies in the electronic packaging field, like SOLECTRON, ABB, TELCO and NOVAR. Also, the group has preferential relations with ALCATEL Network 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. Liviu TOMA: *Data Acquisition Systems. Microprocessor Systems Architecture, Digital Processing Structures*
- 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. *Platform for Study of Physical, Energetic, Electrical, Electronic and Chemical Concurrent Phenomena that Occur in the Thermo-Solar Conversion Process and in the Photo-Voltaic Effect. Automation of Functioning and Exploitation of Solar Assets Based on Thermo-Solar and Photo-Voltaic Conversion*

Duration:	three years, 2006-2008
Total value:	Total value of the project: 4,232,764 RON Total value granted by the Ministry of Education and Research: 3,385,000 RON Total value from "Politehnica": 700,000 RON Value for the Faculty of Electronics and Telecommunications in 2006: 83,000 RON
Director:	Prof. dr. ing. Nicolae ROBU, Rector of the "Politehnica" University Chief of the Electronics Laboratory: Prof. dr. ing. Aldo De SABATA

PROJECT OUTLINE

Research on the use of new sources of energy and quality of the environment are developing at a high pace in the European Union at present. For example, a 5.5 million EURO Energetically Independent Solar House has been built in Germany, at Freiburg. In all countries of the EU, an intense campaign is led in order to draw attention of and to educate the public on energy problems such as decreasing home and industrial power consumption and the accountable use of classical energy resources.
In order for the know-how and experience gained at the "Politehnica" University of Timişoara in the field of alternative sources of energy to be applied effectively, it is necessary to educate students and staff in solar techniques. In this way, our research in this inter- and multi-disciplinary field can be developed further, by taking advantage of opportunities provided by accessing the European Union.

The efficiency of solar panels varies between 30 and 50%, and it is considered good, the efficiency of photovoltaic panels is between 9 and 24%, and it is considered satisfactory, the efficiency of thermal stocking is about 60%, the efficiency of electrical stocking is approximately 80%. The efficiency of stocking as hydrogen reaction heat is larger than 96%, and the efficiency of nano-structured cells is about 4%.

Consequently, it is necessary to create diathermal materials with very high transmittance in the visible domain, athermal materials with very high absorption properties on a large wavelength spectrum, insulating materials with very low thermal conductivity, selective layers, antireflection layers, semiconductor materials with efficiency of 30%, nano-structured cells with efficiency of about 12%.

The "Politehnica" University of Timişoara built its Solar House as an energetic system in 1982-1986. The asset, built by self-funding, was designed by specialists from the Civil Engineering Faculty, and it consists of two floors and basement. In order to minimize thermal losses, the best construction materials that could be found at that time were used.
We want to create a platform of five integrated, electrically connected laboratories around the Solar House, at five faculties: Energy, Automatics, Electronics, Architecture and Civil Engineering, and Physics. The purpose is to create, study, and measure new materials, measure solar radiation in our region, design new structures of solar architecture, find new ways of thermal and electrical stocking of solar energy, design and built home and industrial solar energy systems. We propose to introduce new subjects for license, master, and doctoral students.

These objectives can be achieved by the rehabilitation of the Solar House and of its energetic chain based on thermo-solar conversion and photo-voltaic effect, by the creation and connection of the five laboratories, and acquisition of modern equipment.
The University might have financial benefits by providing spectro-photometric measurements and customized solar design.

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

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

Funding:	State Budget – Ministry of Education, Research and Youth, Partnership Programmes in Priority Domains
Duration:	36 months
Total value:	360,000 RON
Director:	Prof. dr. ing. Traian JURCA
Contraction:	Trading Society for Research, Design and Equipment Production and Automation
Partnership::	P3 "Politehnica" University of Timişoara

FIELD AND GRANT DESCRIPTION

The photovoltaic system is regarded as the main electricity supply and is connected in parallel to the supply from the local grid. Energy from the solar array is consumed by the ac loads in the house, with any excess being exported to the local grid. Any shortfall in output from the array is made up by importing from the local grid. This is a fully automatic process, completely invisible to the householder. To spread the electric power requirements of the house, careful timing of the use of the electrical appliances is essential.

ACTIVITIES AND RESULTS

Installation on the rooftop photovoltaic system of a data acquisition system to measure ambient temperature, solar radiation, wind speed, and electrical power delivered to the grid. A silicon photovoltaic sensor provides the measurement of radiation. Data is captured each minute and average or integrated, as appropriate, over 15-minute

intervals. The amount of storage available for the minute and 15 minute data are limited to approximately two hours and two weeks, respectively.

3. CNCSIS grant 46GR/11.05.2007 No. 1, CODE 350, type A

Title:	***New Methods for Dynamic Testing of High-Resolution Analog-to-Digital Converters***
Total value:	30,000 RON
Director:	Conf. dr. ing. Daniel BELEGA
Members:	As. ing. Ciprian DUGHIR
	As. ing. Beniamin DRĂGOI

FIELD AND GRANT DESCRIPTION

Testing Analog-to-Digital Converters and Measuring systems based on digital signal processors.

ACTIVITIES AND RESULTS

- Presentation of a new procedure for dynamic testing of analog-to-digital converters (ADCs) by means of the three-parameter sine-fit algorithm.
- Determination of a condition for the integer part of the recorded sine wave cycles which ensures that the systematic errors due to the contribution from the image part of the sine wave spectrum are very smaller compared with the quantization noise.
- Determination of a condition for the number of samples which ensures that the influence of the quantization errors on the ADC effective number of bits estimation is negligible.
- Presentation of a new Weighted Multipoint Interpolated DFT Method for normalized frequency estimation.
- Presentation of a new Weighted Multipoint Interpolated DFT Method for estimation the amplitude of a multi-frequency signal component.
- Development of a test system for ADCs in which the ADC dynamic parameters are estimated by the proposed procedure.

4. CNCSIS grant No. 46GR/11.05.2007, Theme No. 19, Code CNCSIS 369,

Title:	***Modern Techniques for Biomedical Signal Processing and Hypermedia Transmitting***
Total value:	10,000 RON
Director:	Conf.dr.ing. Mihaela LASCU
Members:	Prof. dr. ing. Alimpie IGNEA
	Prof. dr. ing. Traian JURCA
	Prof. dr. ing. Aldo DE SABATA
	As. ing. Liliana STOICA

As. ing. Gabriel GĂŞPĂRESC
As.ing. Cora IFTODE
As.ing. Adrian MIHAIUTI
Master student Adrian Val HAREA
Master student Marius Ady MIKLOS

FIELD AND GRANT DESCRIPTION

The purpose of the project is bio-signal acquisition, processing and modelling as well as presenting different analysis techniques and implementing the most effective methods for information storage, sorting and display. The clinically relevant information in the signal is often hidden by noise and interference, and the signal features may not be readily comprehensible by the visual or auditory systems of a human observer. In most cases biomedical signal processing requires a filtering operation for noise and power-line interference removal; spectral analysis is performed to understand the frequency characteristics of the signals, while modelling is necessary for feature representation and parameterization. Computer analysis of biomedical signals has the potential to add objective strength to the interpretation of the expert. Thus, it becomes possible to improve the diagnostic confidence or accuracy even for an expert with many years of experience. This approach to improved health care could be labelled as computer-aided diagnosis. The main task is biomedical signal acquisition, data base realisation and the development of algorithms for biomedical signal analysis. It is intended to setup comparative performance studies regarding the different implemented methods that lead to a correct diagnosis. The project will contribute to high quality human resources (PhD students, graduating students, postgraduate students).

ACTIVITIES AND RESULTS

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

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. Mircea CHIVU: *Electrical And Electronic Measurements. Measurement of Electrical and Non Electrical Quantities. Television Channels Broadcasted Via Satellite*
- 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 I^2C interface has been experimented.

RESEARCH TEAM

- Prof. dr. ing. Sever CRIŞAN: *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 Programme
Prof. Dan STOICIU is representative of the "Politehnica" University of Timişoara.

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. Program ANCS 77/CP/I/13. 09.07
Improvement of research & development facilities in the field of communications at the Faculty of Electronics and Telecommunications, Politehnica University of Timisoara, CDC

Director: Prof.dr.ing. Ioan NAFORNITA

The goal of this project is the endowment of the research & development laboratories of the Communications Department, Faculty of Electronics and Telecommunications (Politehnica University of Timişoara) with modern equipment. These laboratories have as objective the main branches of this particular important R&D domain from the National Strategy entitled *Information Technology and Communications*. This is one of the most dynamical fields of R&D at the present moment in Romania; it has a contribution of over 10% in the Gross National Product (GNP). The level of development from the west region of the country tends to be closer in this case to the global medium level. An important trend in the field is the development of integrated systems that transmit and process all types of data and information. Both the technology and the technical standards organizations are driving toward integrated public systems that make virtually all data and information sources around the world easily and uniformly accessible. Such a system allows integration of services such as telephony, television, and data communications. Computer networks are being widely used as architecture of a communications system. From an R&D point of view, we have seen a trend of designing and making 3G equipment described by UMTS or WiMAX standards. These standards integrate the newest results obtained in fundamental sub-domains with advanced technologies, developed in applications sub-domains. For instance, some of this equipment uses OFDM transmission – which is derived from a

fundamental sub-domain – Signals Circuits and Systems, and/or turbocoding (Theory of Information Transmission). Such an association ensures high performance at the physical layer (1st level from the OSI model), as described by Claude Shannon at the beginning of XXth century. Implementing of functions from superior layers of the OSI model is adapted to new performance obtained at the physical layer with the use of protocols like Mobile IP or IPSec. With this project, improvement of the equipment will be made in eight research labs, where the following disciplines are developed: Signal Circuits and Systems, Theory of Information Transmission, Computer networks architecture, Data communications, Telecommunications Circuits, Network Protocols, Telecommunications Traffic, Optimizing telecommunications networks, Software for Telecommunications, Internet Data Security, Integrated digital networks, Systems for Digital commutation, Radio Communications, Multimedia.

We have in our research team specialists and researchers in the field. The Scientific Secretary of the Politehnica University of Timisoara, Prof. Radu VASIU, the Dean of the Faculty of Electronics and Telecommunications, Prof. Marius OTESTEANU as well as the Head of Department from the Communications Dept., Prof. Ioan NAFORNITA are a part of this team.

The team has seven Ph.D. advisors.

Estimation of the results from this program:

1. New investments in the infrastructure of Research-Development-Innovation 2576,455 thousands RON
2. Medium usage of equipment: 75%
3. Value of investment in infrastructure and communications services 1717,6 thousands RON
4. The number (percentage) of research members to have access at online scientific resources 100%
5. The number of supported entities needed for improvement of offered services capacity = 8.

Expected/estimated Profit:

1. Each lab will develop a contract with a telecommunications industry leading firm for instance, Alcatel-Lucent, with expected value of 5000 euro per year;
2. Each lab will win one CNCSIS funded research grant with an expected value of at least 30000 RON/year

Potential beneficiaries:

- Post-universitary courses – Matlab: Alcatel-Lucent, Solectron, Siemens, Kathrein
- Conferences, workshops, summer schools – teaching staff from other technical universities
- Equipments – suppliers, service
- Publishing houses where books will be edited
- Partner laboratories
- Ph.D. students that will successfully complete their doctoral studies.

2. CNCSIS grant No. GR76/23.05.2007, CODE 637, type A,

Title:	***Increasing digital receivers' performance using wavelets theory***
Total value:	16,000 RON
Director:	Prof. dr. ing. Alexandru ISAR
Members:	Prof. dr. ing. Miranda NAFORNITA
	Prof. dr. ing. Andrei CAMPEANU
	Conf. dr. ing. Dorina ISAR
	S.l. dr. ing. Cornel BALINT
	As. ing. Horia BALTA
	As. ing. Radu LUCACIU
	As. ing. Andy VESA
	As. ing. Corina NAFORNITA
	Techn. Virgil POPOVICI

FIELD AND GRANT DESCRIPTION

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

ACTIVITIES AND RESULTS

- Two articles published in ISI indexed journals
- Four articles published in the proceedings of international conferences organized abroad,

Six articles published in the proceedings of IEEE international conferences organized in Romania.

3. PNCDI 2 – Partnerships, Direction 5, Contract No. 120/01.10.2007, ***Title New piezoelectric sensors based on α-quartz type materials, for safety and quality control food industry***

Director: Dr. Nicolae Miclau
Value: 20,000 RON (for 2007)

4. CNCSIS grant No. – ***GR76/23.05.2007*****, CODE - 342, type - A,**

Title:	***Neural Networks Based System For The Diagnosis And Prognosis Of Urological Diseases***
Total value:	30,500
Director:	Conf. dr. ing. Corina Botoca
Members:	Prof. dr. ing. Vasile GUI Conf. dr. ing. Georgeta BUDURA, Conf. dr. ing. Florin ALEXA Conf. MD. Viorel BUCURAS Conf. MD. Alice DEMA Lecturer MD. Mircea BOTOCA As. ing. Nicolae MICLAU As. MD. Alin CUMPANAS As. MD. Razvan BARDAN MD. Razvan DRAGOI

FIELD AND GRANT DESCRIPTION

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

diagnosis system. During the last year of the project the functionality of the implemented system will be analyzed and clinical diagnosis algorithms, using the predictions offered by the ANN will be elaborated. The experience acquired by the team will be shared with other interested research teams, forming a national research community in the field of neural networks applications in medicine.

ACTIVITIES AND RESULTS

A number of clinical trials on patients with prostate cancer, bladder cancer, kidney cancer, benign prostatic hyperplasia and urinary lithiasis have been performed, in order to collect the clinical data necessary to develope and train a neural system for diagnosis and prognosis

Special photografic equipment for microscopic digital images aquisition has been purchased Chemical and laboratory materials necessary for the clinical trials have been aquired.

Scientific contacts with researchers having similar preoccupations have been established with the occasion of "The 22nd European Association of Urology. Congress" held in Berlin in march, and "The European Association of Urology 7th Central European Meeting" wich took place in Zagreb, Croatia, in October 2007

The team researchers have become members of important international organizations, respectively at the IEEE, EAU and SIU. This gives easy access to the prestigious publications of the named organizations, thus permitting an up to date documentation.

As a result of the use of the special photoaquisition equipment, a book entitled: "Atlas of macro- and microscopical images from the tumoral urological pathology. Methods of acquisition and imaged processing is on the way".

Three licence papers concerning the applications of neural networks in medicine have been realized.

One of the team members has completed a PhD thesis entiteled: „The value of artificial neural networks in establishing the therapeutica indication in the localised and localy advanced prostate cancer".

The research results have been fructified also through participation to national and international congresses and conferences, through publishing in specialized journals, totalizing a number of 15 papers.

5. CNCSIS grant No. 403, CODE TD-403, type Grant for young Ph.D. Students

Title: Optimization Techniques for Radio Channels Transmission

Director: Marius Oltean

Value: 42,500 RON (7,080 RON for 2007)

FIELD AND GRANT DESCRIPTION

Data transmissions applications, including here audio and video signals on radio channels have known a spectacular growth in the last years. The efforts in this field are mainly oriented towards an increased efficiency of this type of transmissions. We can include here many transmission, equalization and filtering techniques that allow high

throughput transmission in the difficult conditions characterizing the radio channel, which is both frequency-selective and time-variant.
Within this context, the multi-carrier modulations provide an excellent alternative to the classical single-carrier transmissions. Among multi-carrier based methods, Orthogonal Frequency Division Multiplexing is already widely used in systems and standards as DAVB, WiFi, WiMAX etc.

Nevertheless, this modulation has some drawbacks. An interesting idea which will overcome some of these drawbacks is to use wavelets carriers instead of complex exponentials (like in OFDM). This kind of approach has some important advantages: simplicity, increased spectral efficiency and flexibility in resource allocation.
The scope of this project is to deeper investigate these advantages and to go further, towards wavelet packets based modulation. The final goal of this research is to propose and test a technique which can be used at the physical layer of radio networks. This new method should lead to increased capacity, robustness and lower complexity for radio channel transmissions.

6. CNCSIS grant No. 189/09.10.2007, CODE -24, type – TD,
Title: Contributions to the application of Kalman filtering in communications
Director: Gal Janos
Value: 35,400 RON (7,080 RON for 2007)

FIELD DESCRIPTION

Estimation of the parameters of chirp signals affected by additive Gaussian noise. This model is linear and Gaussian, allowing the application of the Kalman filter which is optimal from the view of the minimum of variance in the case of monocomponent signals at moderate levels of additive noise.

ACTIVITIES AND RESULTS

In this approach consider the approximate linear state-space model for polynomial phase signals, and propose a random walk assumption for the time evolution of the amplitude of chirp. This assumption adjoins the amplitude to the linear phase parameters which can be estimated by the algorithm.

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. CEEX Project, Contract Nr. CEX 60 / 28.07.2006,

Title:	***Control and Monitoring from the Distance System for Intelligent Buildings „COMODICI",***
Value2007:	150,000 RON
Period:	**2006-2008, UPT partner**
Director:	Prof. dr. ing. Radu VASIU
Members:	Prof. dr. ing. Radu VASIU S.l. dr. ing. Mugur MOCOFAN As. ing. Constantin M. BUCOS As. ing. Mihai ONITA PhD student Iasmina ERMALAI PhD student Andrei TERNAUCIUC PhD student Cristian TECU PhD student Bogdan DRAGULESCU
Partners:	Technical University of Cluj-Napoca "Transilvania" University of Brasov Siemens PSE Brasov

FIELD AND GRANT DESCRIPTION: Intelligent buildings apply technologies to improve the building environment and functionality for occupants/tenants while controlling costs. Improving end user security, comfort and accessibility all help user productivity and comfort levels. The owner/operator wants to provide this functionality while reducing individual costs. Technologies make this possible. An effective energy management system, for example, provides lowest cost energy, avoids waste of energy by managing occupied space, and makes efficient use of staff through centralized control and integrating information from different sources. An efficient integrated system enables a modern, comprehensive access and security system to operate effectively and exchange information with other building systems. Fully integrated functionality includes the ability to open doors, notify responsible staff of unwanted intrusions and ensure that lighting, fire and other building management systems are

informed of staff that arrive or depart the building. This information can then be used to manage the local environment and the resulting energy usage. Life safety systems, notably fire systems, are heavily regulated by stringent code requirements. These requirements do not, however, prevent the information from a fire system being provided to other systems. This opportunity can be exploited to open doors and illuminate a building when fire alarms are received. Transducers (detectors) can measure many building parameters, e.g., vibration, strain and moisture, to continually monitor the building's infrastructure condition. To integrate these systems and exchange information effectively, a ubiquitous and reliable communications infrastructure is needed. These systems are typically managed by personal computers (PCs) using data processing communication techniques and both wired and wireless communication technologies. The key communications issues are redundancy, resilience, security and the assurance for all users that "their data" is secure. Integration considerations may be addressed through standards and conventions, or manufacturers' protocols. Since proprietary solutions permeate the industry, total interworking is currently unattainable, but the future will require full interoperability, with information exchanged among all systems, hence we will need technologies that translate

2. CEEX Project, Contract Nr. CEX 05-D8-77 / 19.10.2005,

Title:	***Foresight Scenarios for the Romanian Economical Sectors with Inovation Potential in the View of the Year 2020 „INOVFOR",***
Value 2007:	190,000 RON
Period:	**period 2005-2008, UPT coordinator**
Director:	Conf. dr. ing. Marian MOCAN
Members:	Prof.dr.eng. Radu VASIU 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:	I.N.C.S.M.P.S. Bucharest I.P.A. SA Bucharest CURS SA Bucharest INOE Bucharest

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

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

The project's objectives are:

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

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

3. CEEX Project, Contract Nr. CEX 05-D8-5/ 10.10.2005,

Title:	***Development of the Concept of Social Responsibility in the Romanian Companies, in the European Context „RSE & UE",***
Value2007:	60,000 RON
Duration:	2005-2008, UPT partner
Director:	Conf. dr. ing. Marian MOCAN
Coordinator:	I.N.C.S.M.P.S. Bucharest
Members:	Prof.dr.eng. Radu VASIU
	Assoc.lect.eng. Diana ANDONE
	Lect.dr.eng. Mugur MOCOFAN
	Assist.eng. Marian BUCOS
	Assist.eng. Mihai ONITA
	Eng. Marius CONDREA
	Eng. Iasmina ERMALAI
Partners:	I.P.A. SA Bucharest
	CURS SA Bucharest
	INOE Bucharest

FIELD AND GRANT DESCRIPTION: The Lisbon Agenda (2000) establishes as the main strategic objective that „the EU should become the most competitive and dynamic knowledge based economy in the world, capable of sustainable economical growth, with more and better work places and with a bigger social cohesion". The project represents an effective contribution to the implementation of those desires.

The project objectives are:

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

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

4. PNCD II project nr. 11-057/14.09.2007:

Title:	**Bio-medical signal acquisition and remote transmission over mobile computing equipments BIOMED-TEL**
Value 2007:	20,000 RON
Director:	Prof.dr.ing. Radu VASIU
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:	Transilvnia University of Brasov
	Technical University of Cluj-Napoca
	Siemens PSE Brasov
	IBCI – Institute for Cardiovascular Diseases Iasi

FIELD AND GRANT DESCRIPTION:
Cardiovascular affections are a prime cause of mortality and morbidity in Romania. The risk of cardiovascular morbidity and mortality remains high despite the attempts of correcting the cardiovascular risk factors. In the field of cardiovascular pathology the death risk by cardiovascular or vascular-cerebral accident persists even after the patients have left the hospital. Monitoring the health condition of these and the analysis of evolution trends of the biophysical and biochemical parameters represents an essential prevention factor.
The project envisages research, design and implementation of a flexible and self-adapting system for the monitoring of biological signals. Research and design activities will be oriented towards developing a system architecture and organization for remote monitoring and creating the interfaces for acquisition, monitoring and remote transmission to a hospital unit (hub). The signals acquired from the patient include: heart bio-potentials, blood pressure, blood O2 concentration, heart and breath rate, temperature, blood glucose concentration etc. The mobile computing equipments (MCE) integrated in the systems will be: Personal Digital Assistant (PDA), and/or „smart phones" (mobile phones MP).
The project will use hard – and software platforms (PDA and MP) of broad usability, which correspond to the requirements of the application in terms of computing power and also by their low price. Based on intelligent interfaces that will be designed, the system will automatically integrate the sensors in „plug & play" mode and also adapt its communication strategy with the hub/dispatcher for cost minimization and for ensuring the reliability and availability of the data link. It cannot be neglected, that this system

development strategy will offer high versatility and scalability and will allow for expanding project results beyond the field of remote medicine.
The project will develop and integrate two categories of **intelligent interfaces**: 1. specific to signal **acquisition** from sensors placed on the patient and 2. **communication** – dedicated (by wire or wireless) necessary for warning/alert messages transfer and also for data transfer to the hospital hub. Remote data-transmission will allow for communication technologies, like: Near Field Communication (RFID, ZigBee, RuBee, Bluetooth), remote wireless: GSM/GPRS, EDGE, UMTS, Wi-Fi, WiMax as well as the wire based ISDN and Ethernet.
The project is relevant to research direction *"1 – Information and communication Technology"*, theme priority: "*1.6. Technologies for distributed systems and embedded systems",* aimed at developing of new technologies for integrated systems based on biomedical sensors networks (specific objective 1.6.14). The project objectives envisage also the development of applications for communication and computing embedded systems (specific objectives 1.6.17 and 1.16.16) ensuring local data processing and transmission to the hospital hub.
The purpose is to develop new technologies for integrated systems based on intelligent sensor networks for monitoring biological signals, remote transmission and processing for prevention and diagnosis. Envisaged are both theory development of architecture and organization of the systems for intelligent sensor networks (wire based or wireless) as well as practical implementation and testing of the mobile monitoring system carried by the patient. The proposal has innovative characteristics: the architecture and organization; the „plug&play" interfaces in compliance with the IEEE 1451 standard; the integration based on widespread platforms (PDA, MP); processing, analysis and detection of alerts using also „artificial intelligence" methods, development of strategies allowing for high reliability of the data link with the hospital hub, all these are characteristics of a modern and extremely useful solution for the developments in the field of bioengineering. The project will create the conditions for radically improved material bases required for the monitoring of the main biological parameters of the patient in the ambulatory which will increase the efficiency of the medical art, especially prevention, reduce the costs of medical assistance and extend the experimental base, very necessary in the field. Also, the formative component, especially by integrating young researchers in a field with real prospects contributes to the relevance of the project.

MAIN ACTIVITIES:

- Analysis of the current world wide developments in the field of ambulatory monitoring of biological parameters acquired signals of processing techniques and methods, instrumentation and dedicated sensors. The stress will be laid on advanced signal processing techniques for preventing or early detection of the patient's health state deterioration;
- Definition of the full specifications – hardware and software for the monitoring application;
- Development of system architecture and organization, adequate for monitoring;

- Design of acquisition and communication interfaces at MCE in accord with the specification including those regarding energy consumption minimization;
- Development of acquisition, processing, analysis, storage/archiving, alert and communication MCE programs with the hub for the acquired signals;
- Training of the young researchers, result dissemination and increase of team visibility for attracting new partners and creating accession conditions to European funds;

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

5. PNCD II project nr. 3598 / 2007

Title:	**Efficiency Increasing of the Support Processes for International Transfer on Managerial Know-How in the Applicative Research and Innovation Field - WINMAN**
Value 2007:	19,000 RON
Director:	Prof.dr.ing. Radu VASIU
Members:	Prof.dr.eng. Corneliu TOMA
	Assoc.lect.eng. Diana ANDONE
	Lect.dr.eng. Mugur MOCOFAN
	Assist.eng. Marian BUCOS
	Assist.eng. Mihai ONITA
	Eng. Marius CONDREA
	PhD student Iasmina ERMALAI
	PhD student Andrei TERNAUCIUC
	PhD student Cristian TECU
Partners:	Academy of Economic Studies
	Institute of National Economy
	"Politehnica" University of Bucharest
	Centre for Industries and Services Economy
	Bridgeman SRL
	Commercial Academy Satu Mare
	Artifex University

FIELD AND GRANT DESCRIPTION

The coherent contribution to the triangle competitivity – technological transfer – research-innovation supposes the elaboration of new methods and processes for knowledge management for the research activities. The recognition of the role of technology transfer mechanisms and / or of the know-how elements is more an more underlined by the academic areas, by the partnerships between research – industry – financial services companies. The role of the new technologies in improving the productivity and the competitivity of different economical sectors / economic clusters /

or even national economies takes to the reconfiguration of the traditional relations between the research results suppliers and the final beneficiaries of those results. The XXI-st century Romania is still characterized by significant gaps regarding the technical efficiency, delays and disfunctionalities in resource administration for the adoption of new technologies in the industry. It is absolutely necessary to correlate, on short term, the requirements related to the increase of the absorbtion capacity of the European founds and the necessity to increase economic performance. Consequently, new decision making models are required, to the benefit of the industrial companies in the field of human resources development for Romania as a whole.

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

MAIN ACTIVITIES:

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

Initiation of new collaborative business processes in the field of technological transfers, able to stimulate innovation in Romania.

6. CNCSIS grant No. A1 / GR76, Code 600, type A

Title:	***Object tracking estimation in video sequences***
Value 2007:	16,000 RON
Director:	Conf. dr. ing. Florin ALEXA
Members:	Prof.dr.eng Corneliu I. TOMA
	Prof.dr.eng Vasile GUI
	Lect.dr.eng. Muguras MOCOFAN
	Lect.dr.eng Catalin CALEANU
	Assist. eng. Andy VESA
	Assist. eng. Ciprian DAVID
	Assist. eng. Artur MULLER
	Eng.Codrut IANASI
	Andreea GALEANU, PhD student
	Stud. Daniela CLIM

FIELD AND GRANT DESCRIPTION

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

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

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

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

7. CNCSIS grant CODE 17, type TD

Title:	***Dinamical scene analize with 3D sensors***
Value 2007:	5,210 RON
Director:	PhD student Georgiana SIMION

FIELD AND GRANT DESCRIPTION

This project is trying to implement a tracking algorithm for drivers' faces for safety applications. It is proved that some face expression and the number of eye blinks per minute are relevant to evaluate the level of tiredness. In this project the main purpose is to track the eyes of the driver using practical filters and to recognize some drivers face expression witch shows the tiredness level.

ACTIVITIES AND RESULTS:

1. Tracking and recognition improvement
2. Specific application model searching
3. Project management
4. Dissemination

8. CNCSIS grant CODE 16, type TD

Title:	***Robust techniques in image registration***
Value 2007:	5,210 RON
Director:	PhD student Daniela FUIOREA-BULUCEA

FIELD AND GRANT DESCRIPTION

In this project a new method of feature based 2D image robust registration is proposed. The image distortion is modeled as a similarity transform with four parameters, estimated sequentially by 1D transforms, resulting in an increased sample density as compared to 4D space processing. By adopting a mean shift estimator, advantages of RANSAC and M-estimators can be combined within a single and sound theoretical framework. Based on this method, the projects is proposing to use image registration techniques to solve node localization problem in a Wireless Sensor Network based on video sensors. Moreover, the proposed solution adds video-field overlap estimation to classical spatial localization. Several registration algorithms are analyzed and tested for performance evaluation.

ACTIVITIES AND RESULTS:

1. The features optimization selection, in order to realiye the image registration.
2. The combination of methods based on points with the methods based on regions using segmentation methods with generates good regions.
3. The project management.
4. Dissemination results.

9. CNCSIS grant CODE 15, type TD

Title:	***Contributions to the use of new informational technologies in the eLearning process***
Value 2007:	5,210 RON
Director:	PhD student Iasmina Leila ERMALAI

FIELD AND GRANT DESCRIPTION

This research project aims the development of an educational platform, which would offer the adaptation of the existing courses to the new informational technologies from the eLearning field (eg. mLearning - Mobile Learning). This platform will be initially tested with the students from the distance Learning Centre of the Politehnica University of Timisoara.

ACTIVITIES AND RESULTS

1. Choosing a mobile device for implementing and testing the concept.
2. Choosing one of the existing courses.
3. The development of an eLearning and mLearning platform
4. Testing the platform on a group of students.

Conclusions and further directions.

International Contracts and Grants

1. Socrates Erasmus Curriculum Development project: *International On-Line Master in Multimedia (IMM – CD)*

Value 2007:	40,600 EUR
Director:	Prof.dr.eng. Radu VASIU
Members:	Prof.dr.eng. Nicolae ROBU
	Assoc.lect.eng. Diana ANDONE
	Lect.dr.eng. Mugur MOCOFAN
	Assoc.lect.eng. Daniel HAIDUC
	Assist.eng. Marian BUCOS
	Assist.eng. Mihai ONITA
	Eng. Marius CONDREA
	Iasmina ERMALAI, PhD student
Partners	Univ. of Nice, FR
	JME Associates, UK
	Univ. of Technology, Kaunas, LT
	E-Collegium, Budapest, HU
	Univ. of Godollo, HU
	Mimoza Kft, Budapest, HU
	Univ. of Zvolen, SK

FIELD DESCRIPTION

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

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

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

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

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

Value 2007:	75,000 EUR
Director:	Prof.dr.eng. Radu VASIU
Members:	Assoc.lect.eng. Diana ANDONE
	Assist.eng. Marian BUCOS
	Assist.eng. Mihai ONITA
	Lect.dr.eng. Matei TAMASILA
	Eng. Iasmina ERMALAI, PhD student
	Eng. Cristian TECU, PhD student
	Eng. Andrei TERNAUCIUC, PhD student
	Eng. Marius CONDREA
	Lucia RAZMERITA, journalist
Partners	Università degli Studi di Palermo, IT
	University of Salzburg, AT
	Confederación Empresarial de la Provincia de Alicante – COEPA, ES
	Gotland University, Gotland, SE
	Karolinska Institute, Stockholm, SE

FIELD DESCRIPTION

E-REPORT project will contribute to set up a communitarian repertory of reference material with regard to the development of innovative methods and best practices in the field of e-learning system for VET (universities and vocational institutes). Particularly, the project is aimed at setting up the basis for the constitution of a transnational virtual study circle.

This demands a comprehensive and transnational approach that implies:

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

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

Value 2007:	365,747 EUR
Director:	Prof.dr.eng. Radu VASIU
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

FIELD DESCRIPTION

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

Aims of the project:

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

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

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

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

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

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

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

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

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

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

RSS, mobile text messaging, mobile accessibility to ViCaDiS) and will promote social networking as an instructional method.

The project **workpackages** are:

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

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

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

Promotional and multiplication materials

5. Publications

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5.2 Books

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6. Other activities

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

6.1. International cooperation

Socrates/Erasmus Cooperation Agreements

Socrates/Erasmus mobility programme 2006/2007
Director: Conf. dr. ing. Dan LASCU
Members: Prof. dr. ing. Viorel POPESCU
S.l. dr. ing. Adrian POPOVICI
S.l. dr. ing. Dan NEGOIŢESCU
S.l. dr.ing. Adrian POPOVICI
Assist. eng, Mircea BĂBĂIŢĂ
Partner: Fachhochschule Deggendorf, University of Applied Sciences.

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

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

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

ACTIVITIES AND RESULTS

Three students specialised in robotics will study at Bremen University for a duration of four months.

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

ACTIVITIES AND RESULTS

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

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

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

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

Erasmus –Socrates, 2006-2007 agreements – Director: Prof. dr. ing. Radu VASIU
- Oulu University of Applied Sciences, Oulu, Finland
- University of Brighton, Brighton, UK
- Universite Sophia Antipolis de Nice / IUT de Nice et de la Cote d'Azur, France

- TEI Piraeus, Athens, Greece
- University of Ulm, Germany
- University of Oldenburg, Germany
- University of La Rochelle, France
- University of Appli
- ed Sciences of St.Poelten, Austria

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

ACTIVITIES AND RESULTS

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

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

ACTIVITIES AND RESULTS

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

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

ACTIVITIES AND RESULTS

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

6.2 Scientific Bulletin

Parts of the research work are presented in our scientific bulletin transaction on Electronics and Telecommunications. The contents of transaction are listed bellow.

Scientific Bulletin of the "Politehnica" University of Timişoara
Transactions on Electronics and Telecommunications
Vol. 52 (66), No. 1, 2007, ISSN 1583-3380

*1. Romulus Terebeş: "*Image restoration through fusion and diffusion".....3

Abstract – This paper presents a new framework for image restoration using the Partial Derivatives Equations (PDE) approach and image fusion techniques. The degraded image is processed independently using two or more PDE filters, then the results are combined through fusion, the final processed image being obtained by a recurrence of the previous steps. The proposed framework allows combinations of any PDE based filters for processing adaptively a given region of the input image with the most appropriate filter. Preliminary results show that this approach is very efficient in designing new image restoration techniques.

Keywords: restoration, PDE, image, fusion

2. Cosmin V. Luduşan, Olivier Lavialle, Romulus M. Terebeş, Monica Borda: An approach to image fusion implementing feature level fusion on seismic attributes *9*

Abstract – Image fusion is an important part of image processing, being performed on different levels of complexity. A feature, or attribute level fusion between two or more images, could be performed by combining the notions of image segmentation and mutual information in order to obtain the fused image. The first step of the proposed method is to decompose the input images into basic features using a connected-components algorithm, followed by the computation of the mutual information using one of the inputs as reference. The fusion method will be tested on synthetic images and further applied on seismic attributes.

Keywords: feature-level image fusion, image segmentation, mutual information, connected- components, seismic attributes.

3. Bogdan Belean, Monica Borda, Raul Malutan, Victoria Biarge-Rodellar, Pedro Gomez: FPGA based digital device for microarray image processing *15*

Abstract - The present paper proposes a digital device architecture for microarray image processing and acquisition which takes advantage of parallel computation capabilities offered by FPGA technology. A microarray

density field. The analytical solution for the forwarded problem is derived. The dipole model analysis reveals that the uniform parallel field is not sensitive to spatial frequencies of the conductivity function. A parallel impressed field was found to be very accurate in localizing areas of non homogeneity by their 'centre of gravity'. A couple of useful properties of the field projection on curves at distance from non homogeneity is also described.

Keywords— dipole model, linearized EIT problem, dipole co-ordinates.

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Abstract – The development of the broadcast services imply prediction of attenuation of the electromagnetic wave in the propagation area proposed to be covered by the radio signal. For prediction, propagation models are used that try to estimate the reception power at different points of interest. This paper presents a study for modelling the propagation of the radio waves transmitted by a broadcast TV station, at 200 MHz video carrier.

Keywords: prediction, propagation model, Longley-Rice

Abstract – The article illustrates some less familiar concepts and methods in the world of "pure engineering" which, on the other hand, are very useful in "shattering the mental barriers".

Keywords: Problem situation, Minimum Problem, Maximum Problem, TRIZ, ARIZ, Multi-Screen, STC

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Abstract – The paper presents an extension of the Xilinx PicoBlaze soft processor with timers for digital signal synthesis applications. The novel direct digital synthesis (DDS) amplitude sequencing architecture is used targeting FPGA implementations. The Xilinx picoBlaze soft microprocessor assembly

code for direct digital synthesis algorithm is presented and its verification using the graphical pBlazIDE tool. The implementations used to explore the design space for specific applications. The results of simulations for two sample applications are presented.

Keywords - *picoBlaze architecture extension, amplitude based direct digital synthesis*

Scientific Bulletin of the "Politehnica" University of Timisoara
Transactions on Electronics and Telecommunications
Vol. 52 (66), No. 2, 2007, ISSN 1583-3380

* Department of Communications, "Politehnica" University of Timisoara, Faculty of Electronics and Telecommunications, Bd. V. Parvan 2, 300223 Timisora, Romania, Phone: +04 0256 403291, Fax: +04 0256 403295, E-Mail: marius.oltean@etc.upt.ro

Abstract – *This paper represents an investigation of the wavelet based multi-carrier modulation performance in flat fading channels. The fading envelope is distributed according to a Rayleigh probability density function. BER performance of the multicarrier wavelet method is computed and analyzed against the classical Orthogonal Frequency Division Multiplexing (OFDM) case, in various scenarios with respect to the Doppler shift influence and to the noise level.*

Keywords: *OFDM, wavelet-based OFDM, fading, Doppler shift.*

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Abstract – *This paper presents a way to determine the best modelling algorithms for working with signals generated by water pipe leaks. Three methods of parametric modelling are presented in this paper: auto-regressive modelling AR, moving average MA modelling and auto-regressive – moving average ARMA modelling. From these methods, the auto-regressive modelling is the best one for analyzing signal sequences from water pipe leaks. A special MATLAB Toolbox was used in order to work with the signals and the parametric models. The name of the Toolbox is ARMASA. Several programmes were written in order to work with ARMASA functions and with the leak signals. The influence of signal length and number of estimation coefficients, are studied in order to show which parametric modelling method works best with signals generated by pipe leaks. The conclusion is that for these types of signals, the AR autoregressive model is the optimal solution. With the help of*

the obtained spectral distribution values, we can further analyze the signals in order to find with precision the position of the leaks. After the exact choice of a parametric modelling algorithm, in this case the AR model, we are able to see the benefits of this choice when dealing with spectral analysis. Signal whitening can be used in order to improve the quality of the Cross Correlation Function (CCF).

Keywords - parametric modelling, water pipes, leak detection, leak location, MATLAB, ARMASA Toolbox, Cross Correlation Function, signal whitening.

3. Daniela Fuiorea*: *A New Point Matching Method for Image Registration Using Pixel Color Information* 15

* Department of Communications, "Politehnica" University of Timisoara, Faculty of Electronics and Telecommunications, Bd. V. Parvan 2, 300223 Timisora, Romania, Phone: +04 0256 403291, Fax: +04 0256 403295, E-Mail: daniela.fuiorea@etc.upt.ro

Abstract –The solution investigated in this paper is based on a mean shift estimator for feature point matching. We propose a new method based on pixel colour information, to reject possible mismatches between the pairs of points, in order to simultaneously increase the estimation accuracy and reduce the processing time. The method is part of an image processing tool developed for video sensor localization in Wireless Sensor Networks. The solution is analyzed and tested for performance evaluation.

Keywords: mean shift estimator, image registration, video sensor localization

4. Marius Rangu*: *An Algorithm for Automated Translation of Crosstalk Requirements into Physical Design Rules* 20

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Abstract – Signal integrity is a major concern when designing printed circuit boards for high speed digital applications, and crosstalk is one of the most important issues. Crosstalk is influenced both by the routing geometry and the electrical parameters of the drivers and receivers on the board, and in order to keep crosstalk noise under control, minimum clearances must be enforced between sensitive and aggressive signal traces. However, the relationship between the crosstalk requirements (in electrical terms – usually [mV]) and the physical design rules (in geometrical terms – usually [mm]) is not very obvious and in order to evaluate it, some form of analysis must be involved. This paper proposes an algorithm designed to automate this process, based on differential impedance equivalence, implemented as a SAX Basic script and embedded into PADS Layout Editor.

Keywords: PCB, PADS Layout, crosstalk, clearance, design rules, parallelism

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Abstract - For visually impaired people the hearing sense replaces the seeing sense. To help people move in an unstructured environment in the real world we try to make a 3D virtual audio reality. The mostly used method is HRTF (Head Related Transfer Functions), a set of audio filters. A simulation model in Matlab demonstrates the possibility to tell visually impaired people where the obstacles are. We use the simulation to make a man-machine interface, which is part of a big project to guide these people to walk and work in the real world.

Keywords: visually impaired people, 3d virtual audio, binaural, HRTF.

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Abstract – The work presents the possibility of using CMOS current conveyors for high-speed application. It is used a simple current conveyor bidirectional, self-biased, where the static current is not imposed by auxiliary current sources. One shows the deduction of the self-biasing current equation, which depends especially on the transistor channel width and the supply voltage. The simulation results are presented which confirm the correct and precise calculation and behaviour of these conveyors.

Keywords: CMOS, current conveyor, self-biased current conveyor.

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Abstract – The paper addresses the problem of estimating the parameters of polynomial phase signals (PPS) embedded in Gaussian noise. We consider an estimation method based on an approximate linear state space representation of the polynomial phase signal. This approach offers the opportunity to use a standard Kalman filtering procedure in view to estimate the parameters of PPS

signals (B-Y, R-Y) and adjusted for optimal flesh tone display. The correction is applied as colour variation, hence the processing is less intrusive than a full range correction approach and also allows for a cost-effective hardware implementation.

Keywords: Flesh Tone Correction, flesh toning, YUV, RGB, IQ, NTSC, PAL

11. Mircea Coser: *A TRIZ View on Air Navigation Evolution* ….....54

Abstract – The article illustrates some concepts related to the patterns of evolution of technical systems as seen in TRIZ and their identification at the level of air navigation systems.

Keywords: TRIZ, Multi-Screen, System Operator, Ideal state

12. Emanuel Puschita, Tudor Palade, Ancuta Moldovan, Simona Trifan: An Overview of Intra-Domain QoS Mechanisms Evaluation …….....58

Abstract – There has been a significant amount of work in the past decade to extend the IP architectures and to provide QoS support for multimedia applications. IP networks are evolving from a best-effort service support model, where all transmissions are considered equal and no delivery guarantees are made, to one that can provide predictable support, according to specific QoS requirements. Furthermore, recent applications are associated with user interactions, and the ability to browse different scenarios at the same time. All these aspects made the researchers look for other solutions in order to assure a QoS support. This paper includes the results obtained in order to provide a global analysis of the QoS parameters on four network layers, offers the mobility effect over the QoS parameters, especially in case of end-to-end delays introduced by handover procedure in different wireless access systems categories.

Keywords: intra -domain QoS access mechanisms, mobility, QoS parameters

6.3 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 Timişoara, 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.

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 Timişoara, please visit: http://www.romaniatourism.com/timisoara.html