INSTITUTE OF RADIOELECTRONICS

WARSAW UNIVERSITY OF TECHNOLOGY
FACULTY OF ELECTRONICS AND INFORMATION TECHNOLOGY

ANNUAL REPORT

2002

Warsaw, February 2003

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K. Zaremba
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From the Director

In our issue last year, I focussed on the 50th anniversary of our mother Faculty of Electronics, and tried to evaluate in that jubelee's context how the Institute of Radioelectronics had stood the test of time. As top priorities, I pointed to the scientific excellence and devotion of our staff, the powerful network of our laboratories, the broad yet well structured and industrially relevant offer of our educational courses, and – last but not least – our international collaboration programmes. Today I am pleased to observe that of those four areas, none has lost any of its importance, and all have seen changes for the better. This is indicative not only of the Institute's currently strong situation, but also of our good strategic planning and monitoring of the socio-economical and international environment.

Since people are undoubtedly the core of any success, let me start by looking at the recent accomplishments of and awards bestowed upon our staff. Professor Ignacy Malecki, the Father of the Acoustic Division and the first dean of the Faculty, has celebrated his 90th birthday giving us one more chance to enjoy his outstanding qualities, which we hope will continue to descend on our young staff. Professor Stefan Hahn has been elected Ordinary Member of the Polish Academy of Sciences. A new professorial nomination of Professor Jacek Wojciechowski has been, after two professorial nominations last year and one in 2000, another step towards rejuvenating our staff. Unfortunately, there are not only good news. In August we learned with sorrow of the death of Professor Adam Piątkowski, distinguished scientist, teacher and leader of the research group.

One of our long-term goals is to balance the mature with young researchers, to stimulate the flow of new ideas, and to thus defend our outstanding position on the national and international scientific and educational arena. While enjoying our own achievements, we cannot forget about the troublesome system transformations, budget holes, and unemployment, which surround us. We must assume our share of responsibilities for improving the well being of the whole Polish nation as well as for preparing Poland to European integration. These responsibilities should ride on the shoulders of persistent and vigorous staff, to ensure that they will be fulfilled. Therefore, I am especially pleased to mention our team of fifty Ph.D. students – increasing in numbers and already exhibiting many brilliant qualities. Several of them have already gained valuable distinctions at scientific conferences and are expressing deep interest in further University career. In fact, out of this year five Ph.D. graduates four have stayed with us.

Another noteworthy aspect about the Institute is international renown of our professors. They publish frequently referenced papers and are invited to present their works at the world's leading conferences and in journals. They act as reviewers for such journals, including those of the IEEE series, and serve as technical programme committee members of many prestigious symposia. These activities certainly spread the good name of the Institute, and increase our chances for substantial participation in the Sixth Framework European Community programmes: integrated projects, network of excellence, and many other ones.

Let me declare that enhanced international collaboration is yet another of our long-term goals. In fact, there are two unique features of our Institute considered as the Faculty unit, which I believe will prove helpful in furthering our foreign contacts:

Firstly, throughout the years we have implemented an extensive network of laboratories that allow our students and staff to undertake research, design and prototyping projects. Our laboratories are a high profile expression of our commitment to interactive teaching, problem-related research, and good engineering. They are constantly upgraded and expanded, with this year's main acquisition being a complete GSM system generously donated by NORTEL Networks.

Secondly, I would like to stress the wide scope of our competence. For decades our staff members have been investigating domains so different as electroacoustics and electromagnetics, nuclear and biomedical engineering, radiocommunications, television and multimedia, signal processing and monitoring systems.

Our world of dedication, open - mindness, and creativity attracts regular students, but also foreign exchange students and students within the scheme of continuing education. In the last regard, we have been encouraged and this year successfully extended our course offer from Radiocommunications to, additionally, Multimedia Technologies. Another way which we pursue in order to reach a broader audience is by organising Annual Symposium „News in Audio and Video Techniques" and co-organising annual National Conference on Radiocommunications, Broadcasting and Television as well as biannual International Conference on Microwaves, Radar and Wireless Communications MIKON – all these events being of international dimension.

We are deeply grateful to all of those who identify with our goals, who support and sponsor our activities, and re or will become our partners in the research and teaching projects. In 2003, most of the challenges for us remain the same. We will continue to their implementation and shall be pleased to report to you again in 12 months time.

Warsaw, February 2003

Professor Józef Modelski, Ph.D., D.Sc.

Contents

This Annual Report summaries the research activities of the Institute in 2002, as well as the teaching activities of the academic year 2001/2002

1. GENERAL INFORMATION

1.1. Mission of the Institute

The Institute of Radioelectronics perceives its long-term mission in bridging the gaps between academia, industry, and society. This mission is broken into three measurable objectives: to provide teaching of contemporary societal relevance; to seek excellence in scientific research; and to run projects meeting the international standards.

Year 2002 has been successful in each regard. The quality and effectiveness of our education have once again been confirmed by increasing numbers of undergraduate diplomas: M.Sc. (83) and B.Sc. (87), and this message has been reinforced by a noteworthy number of 5 defended Ph.D. theses. The quest for scientific excellence extends from our professors (one of whom has been elected ordinary member of the Polish Academy of Sciences) to staff of a more recent vintage (who have assembled several distinctions for best conference presentations). Through the participation in two on-going EUREKA projects, we are getting prepared for new activities within the Sixth Framework Programme of the European Community.

Considering the Institute of Radioelectronics as a unit of the Faculty, one should note and appreciate the extremely broad competence, which spans the whole field of radioelectronics. It comprises:
- electromagnetic and acoustic field theory, acoustic and electromagnetic wave generation and propagation,
- signal theory, processing, coding, transmission, with regard to electronic, electroacoustic, and TV signals,
- physical phenomena in radio engineering, acoustic, nuclear engineering, and medical systems,
- biomedical signal analysis, medical imaging, medical informatics,
- X-ray, MR, and emission tomography,
- detection and spectrometry of radiation,
- analysis and synthesis of electronic systems,
- intelligent multimedia systems and multimedia converged (video, data and voice),
- measuring methods and systems,
- analysis, measurement, and estimation of sound and image distortion.

We realise that it may not be so easy for a novice student to freely navigate through such a variety of subjects. Thus a few years ago we embarked on a phase of strategic planning, which has brought results in the form of three well-defined specialisations: radiocommunications, multimedia, and biomedical engineering. These are very well perceived by students and their potential employers. Our graduates prove competitive on the demanding job market in Poland and abroad. They find employment in telecommunication services, mobile communications, information technology, television, and also in public services.

As a compliment to regular studies, the Institute is deeply engaged in the continuing education. In 2002, the previous courses in Radiocommunications have been supplemented with the new courses in Multimedia Technologies. This expanding offer has been attracting increasing number of students.

Broad competence and efficient organisation are important means to success, but they are not everything. Our key asset is our staff, whose talents and enthusiasm have gained national and world-wide recognition over the years. The Institute now assembles 10 professors and 43 assistant professors. A new trend started in 2001 has been optimistically confirmed this year: it concerns rejuvenation of our staff. Out of five this 2002 Ph.D. graduates, four now continue their research at the Institute. Today 49 students work towards Ph.D., and many of them express the interest in further University career.

Considering commercial opportunities awaiting our graduates on the open market, it would be difficult if not impossible to maintain their interests in science and education without the generous support of the Foundation for Development of Radiocommunications and Multimedia Technologies. In 2002, the Foundation has subsidised 12 undergraduate and 7 graduate scholarships. It monitors and awards the progress of young Polish researchers.

Besides people, another noteworthy asset of the Institute is its exceptional laboratory basis. This year's precious donation by NORTEL Networks has been a GSM system for Radiocommunication Laboratory. Also, the first phase of constructing a new Antenna Laboratory has been accomplished. The Institute has an anechoic chamber and a sound studio, an HP ImagePoint, and various professional software packages. On the whole, over 10 other laboratories are available to the students, as well as the computer network.

In fact, the Institute covers the full process of technological development, from innovative ideas up to the construction of prototypes. The products are applicable in: radio communication systems, radio-location antennae, television equipment, radiomonitoring systems, high-efficiency energy sources, high-power radio engineering devices, equipment for time and frequency services, biomedical instrumentation, measurement systems involving industry, nuclear engineering for scientific research, and medicine. New projects for the food industry are being developed.

The Institute carries out those tasks under long-term contracts with national and foreign universities as well as research and commercial institutions listed in our previous reports. The two EUREKA projects are strengthening our partnerships with the Swedish Institute for Food and Biotechnology, Landeskrankenhaus-Universitatsklinikum Graz, SIEMENS AG Oesterreich, and Technische Universitaet Graz. Recent collaboration with Worcester Polytechnic Institute (US) has already resulted in the participation of our graduate as well as undergraduate students in two American industrial projects. The Institute actively participates in the Socrates programme and NATO scholarship programme, and encourages personal participation of its students and staff in international scientific events.

1.2. Board of Directors

Director of the Institute:

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1.3. Organisation of the Institute

The Institute of Radioelectronics consists of the following research and teaching divisions:
- Radiocommunications Division;
- Television Division;
- Electroacoustics Division;
- Radio-Engineering Division;
- Microwave and Radiolocation Engineering Division;
- Nuclear and Medical Electronics Division.

The structure of the Institute includes Library, Financial Section, Supply Section and Multimedia Problems Group no. 288 at Polish National Committee for Standarization in Multimedia.

1.3.1. Radiocommunications Division

Head of Division
Tomasz Kosiło, Ph.D., Assistant Professor
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e-mail: T.Kosilo@ire.pw.edu.pl

Senior academic staff:

Jan Ebert, D.Sc.	Tenured Professor
Józef Modelski, D.Sc.	Tenured Professor
Jacek Wojciechowski, D.Sc.	Tenured Professor
Tomasz Buczkowski, Ph.D.	Assistant Professor
Henryk Chaciński, M.Sc.	Senior Lecturer
Jacek Cichocki, Ph.D.	Assistant Professor
Krzysztof Czerwiński, Ph.D.	Assistant Professor
Krzysztof Derzakowski, Ph.D.	Assistant Professor
Jacek Jarkowski, Ph.D.	Assistant Professor (0,5 from 1.07.2002)
Wojciech Kazubski, Ph.D.	Assistant Professor
Jerzy Kołakowski, Ph.D.	Assistant Professor
Krzysztof Kurek, Ph.D.	Assistant Professor (from 1.11.2002)
Mirosław Mikołajewski, Ph.D.	Assistant Professor
Juliusz Modzelewski, Ph.D.	Assistant Professor
Krzysztof Puczko, Ph.D.	Senior Lecturer (0,5)
Karol Radecki, Ph.D.	Assistant Professor
Kajetana Snopek, Ph.D.	Assistant Professor (from 1.10.2002)
Zbigniew Walczak, Ph.D.	Assistant Professor (from 1.11.2002)
Yevhen Yashchyshyn, Ph.D.	Assistant Professor

Junior academic staff - Ph.D. students:

Fathi Ali Alwafie, M.Sc.	from 1.11.1996
Piotr Bilski, M.Sc.	from 1.10.2001
Artur Gałat, M.Sc.	from 15.03.1999
Dariusz Grabowski, M.Sc.	from 1.11.1998
Paweł Kącki, M.Sc.	from 1.03.2001
Tomasz Keller, M.Sc.	from 1.10.1999
Arkadiusz Kurek, M.Sc.	from 1.11.2002
Jacek Marzyjanek, M.Sc.	from 1.03.1999
Stanisław Maszczyk, M.Sc.	from 1.11.1998
Nguyen Minh, M.Sc.	from 1.03.1999
Jacek Nowak, M.Sc.	from 1.10.2001
Dariusz Nowakowski, M.Sc.	from 1.10.2002
Marcin Piasecki, M.Sc.	from 1.05.1999
Grzegorz Radzikowski, M.Sc.	from 1.10.2000
Rafał Szumny, M.Sc.	from 1.10.2002
Arkadiusz Trojanowski, M.Sc.	from 1.10.2002
Sebastian Wydra, M.Sc.	from 1.03.2002

Technical staff:
Marek Marcinkowski
Stanisław Żmudzin, M.Sc. (0,25)

Retirements:

Stefan Hahn, D.Sc.	Professor
Waldemar Kiełek, D.Sc.	Associate Professor

The teaching activities of the Radiocommunications Division are related to radiocommunication systems, antennae, signal processing, measurement in radiocommunications, and networks. Research is focused on specific problems of radiocommunications, such as:
- improving the efficiency of high-frequency power sources and other high-frequency devices;
- digital modulations;
- optimization methods of antenna synthesis;
- multidimensional signals theory;
- mobile systems;

- measurements in radiocommunications;
- networks (radio and telecommunications);
- radiomonitoring methods and systems;
- cellular communication systems (GSM, UMTS, TETRA).

Current research topics include:
- computer-aided analysis and synthesis of class D, class E and class DE resonant amplifiers, resonant rectifiers, resonant dc/dc converters, uninterruptible power suppliers, amplitude modulators;
- theory and applications of multidimensional complex signals;
- application of Hilbert transform to antenna radiation pattern forming and optimization;
- digital modulations broadcasting in AM bands;
- application of GPS for selected geodetic measurements;
- health and environmental aspects of electronics;
- fault detection in electronic systems;
- simulation and design of networks;
- scheduling in radio networks;
- development of mobile radiomonitoring systems;
- application of DSP and FPGA techniques for radiocommunication signals processing.

1.3.2. Television Division

Head of Division
Władysław Skarbek, D.Sc., Professor
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Senior academic staff

Andrzej Buchowicz, Ph.D.	Assistant Professor
Krystian Ignasiak, Ph.D.	Assistant Professor
Tomasz Krzymień, M.Sc.	Senior Lecturer
Marek Rusin, Ph.D.	Assistant Professor (0,5)

Junior academic staff

Grzegorz Galiński, M.Sc.	Assistant (0,5)

Ph.D. students

Sylwester Barański, M.Sc.	from 1.10.2002
Piotr Bobiński, M.Sc.	from 1.11.1998
Grzegorz Galiński, M.Sc.	from 1.01.1998
Krzysztof Kucharski, M.Sc.	from 1.03.2002
Andrzej Ritz, M.Sc.	from 1.07.1999
Ewa Snitkowska, M.Sc.	from 1.10.2000
Aneta Świercz, M.Sc.	from 1.10.2002
Karol Wnukowicz, M.Sc.	from 1.03.1999

Technical staff
Bogdan Kwiatkowski, M.Sc.
Tomasz Smakuszewski, M.Sc.

Television Division conducts scientific and applied research in multimedia technologies. The Division is also experienced in e-learning standards and platforms with a special emphasis on multimedia tools for collaborative e-learning using media streaming and searching techniques. The Division continues its efforts in development of MPEG standards (MPEG-4 and MPEG-7). Specific research topics in 2002 included:
- video and audio compression (wavelet transform; vector quantisation, low bitrate algorithms);
- intelligent multimedia systems;
- image indexing, multimedia database indexing;
- object tracking and recognition;

- motion analysis;
- selected topics in the design of cable television networks.

1.3.3. Electroacoustics Division

Head of Division
Zbigniew Kulka, D.Sc., Professor
room 132, phone +48(22)6607621
e-mail: Z.Kulka@ire.pw.edu.pl

Senior academic staff

Ewa Kotarbińska, Ph.D.	Assistant Professor
Andrzej Leszczyński, Ph.D.	Assistant Professor
Jerzy Narkiewicz-Jodko, Ph.D.	Assistant Professor
Maria Tajchert, Ph.D.	Assistant Professor

Junior academic staff

Piotr Nykiel, M.Sc.	Assistant (0,5)

Ph.D. students

Michał Kostrzewa, M.Sc.	from 1.10.2001
Grzegorz Kustra, M.Sc.	from 1.10.2000
Maciej Mikołowicz, M.Sc,	from 1.03.2001
Piotr Nykiel, M.Sc.	from 1.07.1998

Retirements:
Andrzej Aronowski

The activities of the Division concern electroacoustics and digital audio techniques including investigations, measurements, and applications. They are focused on:
- digital audio;
- design and measurement of electroacoustic transducers;
- investigation and modelling of acoustic field distribution;
- noise control and active noise reduction;
- psychoacoustics;
- architectural and industrial acoustics;
- sound studio techniques;
- hearing protection.

Current research topics include:
- digital audio signal processing;
- active noise reduction systems applied to acoustic waveguides;
- objective and subjective methods of sound quality evaluation;
- detection of auditory warning signals in the presence of industrial noise;
- elaboration of computation methods for radiated acoustic field by surface acoustic sources in free space and their implemention on a PC.

The Division is equipped with an anechoic chamber and sound studio.

1.3.4. Radio-Engineering Division

Head of Division
Roman Z. Morawski, D.Sc., Tenured Professor
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Senior academic staff

Andrzej Miękina, Ph.D.	Assistant Professor
Krzysztof Mroczek, Ph.D.	Assistant Professor (from 1.10.2002)
Andrzej Podgórski, Ph.D.	Assistant Professor
Wiesław Winiecki, Ph.D.	Assistant Professor

Junior academic staff

Robert Łukaszewski, M.Sc.	Assistant

Ph.D. students

Cezary Niedziński, M.Sc.	from 1.04.1998

Technical staff
Tomasz Daniluk, M.Sc. (from 1.10.2002)

The activities of the Division concern fundamental and applied research associated with high-frequency techniques, metrology, instrumentation and measuring systems. They are focused on:
- improving the quality of measurements using signal-processing techniques;
- designing automated computer-based measuring systems.

Current research topics include:
- software environment for computer-aided design of algorithms for reconstruction of measurands and for calibration of measuring systems;
- software environment for computer-aided design of measuring systems, virtual instrumentation, plug-in boards for data acquisition, IEEE-488 equipment, measuring systems for the measurement of wide-range broadcasting signals, modern information technologies e.g. LabVIEW, Java, XML and modern communications technologies e.g. Internet, GSM, Bluetooth in distributed control and measuring systems;
- computer-aided spectrophotometry for applications in the monitoring of natural environment and telecommunication systems;
- portable signal analysers for technical diagnostics and the monitoring of natural environment.

1.3.5. Microwave and Radiolocation Engineering Division

Head of Division
Tadeusz Morawski, D.Sc., Tenured Professor
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Senior academic staff

Wojciech Gwarek, D.Sc.	Tenured Professor
Stanisław Rosłoniec, D.Sc.	Tenured Professor
Małgorzata Celuch-Marcysiak, Ph.D.	Assistant Professor
Daniel Gryglewski, Ph.D.	Assistant Professor
Przemysław Miazga, Ph.D.	Assistant Professor
Krzysztof Robaczyński, M.Sc.	Senior Lecturer (0,5)
Maciej Sypniewski, Ph.D.	Assistant Professor
Andrzej Więckowski, Ph.D.	Assistant Professor
Wojciech Wojtasiak, Ph.D.	Assistant Professor
Jolanta Zborowska, Ph.D.	Assistant Professor

Junior academic staff - Ph.D. students

Tomasz Ciamulski, M.Sc.	from 1.03.2000
Paweł Kopyt, M.Sc.	from 1.10.2001
Piotr Majchrzak, M.Sc.	from 1.10.2002
Artur Moryc, M.Sc.	from 1.03.2002
Janusz Rudnicki, M.Sc.	from 1.10.2000
Robert Szelenbaum, M.Sc.	from 1.10.2001
Paweł Zajączkowski, M.Sc.	from 1.11.2002

Technical staff
Krzysztof Robaczyński, M.Sc.   (0,5)
Mirosław Lubiejewski

Retirements
Krzysztof Kowalski, Ph.D. Assistant Professor

The Microwave and Radiolocation Engineering Division conducts scientific and applied research in the area of electromagnetic field theory, microwave theory and techniques, measurement techniques for very high frequency range as well as computer-aided design, data acquisition and data processing. Specific research topics in 2002 included:

- design of high-frequency systems for radar techniques (oscilators, synthesisers, modulators, amplifiers, high-power noise sources, transmitter/receiver modules);
- methods of synthesis and computer-aided design of passive and active microwave circuits (couplers, summators and dividers, switches, transistor circuits);
- analysis and design of multielement planar in-phase radar antenna arrays intended to work at high power level;
- development of new structures of noncommonsurate nonsynchronous transmission line stop-band filters and application of them in various radar equipments;
- development of new optimization algorithms for computer-aided synthesis of antenna arrays with especially shaped radiation patterns;
- design of modern computer-aided measuring systems;
- development of numerical methods and implementation of computer programmes for full-wave analysis and design of two- and three-dimensional microwave circuits (filters, matching circuits, uniform and periodic guiding structures, polarisers, antennae);
- development of non-linear programming and artificial intelligence methods, and their application to the automated design of microwave circuits.

1.3.6. Nuclear and Medical Electronics Division

Head of Division

Zdzisław Pawłowski, D.Sc., Tenured Professor
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Senior academic staff

Adam Piątkowski, D.Sc.	Tenured Professor
Piotr Bogorodzki, Ph.D.	Assistant Professor (on the leave)
Piotr Brzeski, Ph.D.	Assistant Professor
Grzegorz Domański, Ph.D.	Assistant Professor
Tomasz Jamrógiewicz, M.Sc.	Senior Lecturer
Marek Karolczak, Ph.D.	Assistant Professor (on the leave)
Marian Kazubek, Ph.D.	Assistant Professor
Bogumił Konarzewski, Ph.D.	Assistant Professor
Janusz Marzec, Ph.D.	Assistant Professor
Tomasz Olszewski, M.Sc.	Senior Lecturer
Lechisław Padee, Ph.D.	Senior Lecturer (0,33)
Ewa Piątkowska-Janko, Ph.D.	Assistant Professor
Artur Przelaskowski, Ph.D.	Assistant Professor
Dariusz Radomski, Ph.D.	Assistant Professor (from 1.02.2002)
Waldemar Smolik, Ph.D.	Assistant Professor
Roman Szabatin, Ph.D.	Assistant Professor
Krzysztof Zaremba, Ph.D.	Assistant Professor

Ph.D. students

Paweł Bargieł, M.Sc.	from 1.10.2001
Piotr Boniński, M.Sc.	from 1.03.2002
Eryk Goś, M.Sc.	form 1.03.2002
Dawid Koziński, M.Sc.	from 1.03.2002
Robert Kurjata, M.Sc.	from 1.10.2000
Potr Łyszcz, M.Sc.	from 1.10.2001
Mateusz Orzechowski, M.Sc.	from 1.03.2001
Adam Padee, M.Sc.	from 1.03.2002
Robert Sulej, M.Sc.	from 1.03.2002
Artur Trybuła, M.Sc.	from 1.03.2002
Tomasz Wolak, M.Sc.	from 1.12.1998
Anna Wróblewska, M.Sc.	from 1.11.2002

Technical and administrative staff

Dariusz Ćwiek, M.Sc.	(on the leave)
Andrzej Wasilewski	
Joanna Witkowska	

Retirements

Waldemar Scharf, Ph.D.   Assistant Professor

The research and teaching activities carried out in the Nuclear and Medical Electronics Division are concentrated on Biomedical Engineering. Research in this inter-disciplinary area covers a broad range of topics and integrates sophisticated electronics and information technology with elements of medical knowledge. The Division's research is focused on following topics:

- nuclear medicine (emission tomography: SPECT, PET);
- quantitative computer-aided tomography;
- tomographic dynamic studies;
- process tomography;
- magnetic resonance imaging;
- analogue and digital radiography;
- medical image processing and recognition;
- methods and instrumentation for electrocardiography, high resolution electrocardiography and electro-encephalography;
- medical applications of isotope techniques;
- biomedical accelerators.

Areas of recent studies include:
- methodology and apparatus for non-invasive determination of bone density and concentration of heavy metals in bone;
- electrical instability of heart study;
- multimodal imaging of topographic, tomographic and functional studies in medicine;
- correlated methods for the investigation of neurosystems by NMR and SPECT tomography;
- MR imaging sequence optimisation for better contrast resolution in heart and large vessels examination;
- telecardiology;
- field homogeneity in MRI tomography improvement with combined "passive" and "active" approach;
- expert systems for high resolution ECG with P-wave averaging technique;
- application of wavelet transform for echocardiographic images' quality improvement and for image data compression;
- algorithms for 3D brain imaging;
- dynamic tomographic studies (computer-aided method of early diagnosis of brain strokes);
- digital structural radiography;
- X-ray stereoscopy.

1.4. Evening Studies and Continuing Education

1.4.1. Engineering Evening Studies on Radio-communications

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Krzysztof Kowalski, Ph.D.,
Waldemar Radzikowski, Ph.D.,
(Telekomunikacja Polska S.A.
Polish Telecommunications)

1.4.2. Postgraduate Studies

Head
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  e-mail: S.Rosloniec@ire.pw.edu.pl

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1.4.3. Studies on Radiocommunications, Multimedia Technologies and Biomedical Engineering "RADEM"

Head
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       RADEM@ire.pw.edu.pl

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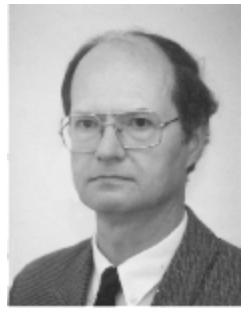
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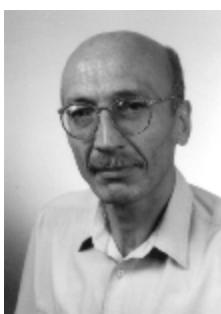
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M.Sc. ('86), Ph.D. ('93); telecommunications, multimedia, radio-frequency engineering; Assistant Professor, Radio-Engineering Division; [Edu62]; [Pro9]; [Rep3]

Karol W. Radecki

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M.Sc. ('70), Ph.D. ('78); radio-frequency engineering and measurement; Assistant Professor, Radio-communications Division; Head of the Student Laboratory of Signal Theory and Modulation (97'-); IEEE Member (2000-); Member of the National Committee of URSI; ('90-) Member of the Programme Committee of the National Symposium of Radio Science ('99-); National Chairman of URSI Commission A Electromagnetic Metrology ('90-); Member of the Scientific Advisory Board, Polish Association for the Blind ('95-); team award for the Rector (2002); [Edu28], [Edu87], [Edu88], [Edu123]; [Pro6], [Pro20]; [MSc51], [MSc70]; [Pub79], [Pub103]; [Rep28], [Rep35]; [Con21]

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M.Sc. (96'), Ph.D. (2001); medical and nuclear engineering; Assistant Professor, Nuclear and Medical Electronics Division; individual award of the Rector (2002); [Pro12]; [Pub57]; [Rep31]

Krzysztof Robaczyński

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M.Sc. ('69); microwave technique; Senior Lecturer (0,5), Microwave and Radiolocation Engineering Division; [Pro2]; [Rep24]
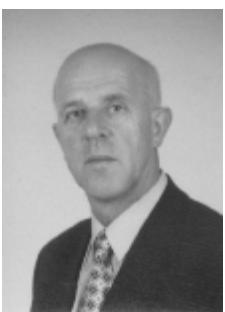
Stanisław Rosłoniec

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M.Sc. ('72), Ph.D. ('76), D.Sc. ('91); microwave technique; Prof. Title (2001); Microwave and Radiolocation Engineering Division; Member of the Faculty Council Committee on Scientific Research ('99-2002); Member of the Faculty Council Commitee on Faculty Organisation (2002-); [Edu29], [Edu35], [Edu78]; [Pro2]; [MSc55]; [Pub2]; [Rep24]

Marek Rusin

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M.Sc. ('66), Ph.D. ('75); radio-communications, television; Assistant Professor, Television Division; Term in Contract, half-time;

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M.Sc. ('72), Ph.D. ('77), D.Sc. ('94); informatics; Professor ('97-), Television Division, Head (2000-); Head of the Multimedia Techniques Studies in the Television Division of the Institute of Radioelectronics ('97-); Head of the Student Laboratory of Multimedia Techniques ('97 -); Member of the Faculty Council Committee on Academic Staff Development ('99-); Member of the Conference Programme Committee of: 2002 Conference on Pattern Recognition (Portugal), Head of Polish National Committee for Standarization in Multimedia ('99-); ISO /SC29/WG11 (MPEG) expert (2000-); Member of Advisory Board of "Image Processing and Communications" ('95-); [Edu70]; [Pro40]; [MSc2], [MSc4], [MSc36], [MSc59], [MSc72]; [BSc2], [BSc27], [BSc34], [BSc48] ; [Pub32], [Pub35], [Pub36], [Pub51], [Pub62]; [Pub78], [Pub99], [Pub100], [Pub107], [Pub108], [Pub109], [Pub110], [Pub111], [Pub112], [Pub113], [Pub114], [Pub115], [Pub116], [Pub123]; [Rep29]; [Con4], [Con24], [Con28], [Con29], [Con34]
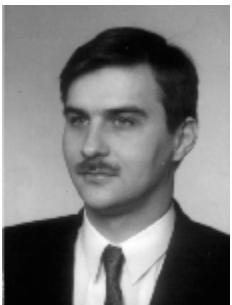
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M.Sc. ('91), Ph.D. ('97); biomedical engineering, computer engineering; Assistant Professor, Medical and Nuclear Electronics Division; Head of Computer Tomography Laboratory ('99-); [Edu17], [Edu25], [Edu41], [Edu72], [Edu92]; [Pro10], [Pro12], [Pro17]; [BSc46], [BSc68]; [Pub38], [Pub57], [Pub97]; [Rep25], [Rep30], [Rep31]; [Con15], [Con34]

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MSc. (91'), Ph.D. (2002); signal and system theory; Assistant Professor, Radiocommunications Division; [Edu27]; [Pro28]; [PhD3]; [Pub7]; [Rep4], [Rep7]

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M.Sc. ('69), Ph.D. ('78); electro-acoustics, acoustics measure-ments, architectural acoustics; Assistant Professor, Electro-acoustics Division; Member of the Polish Acoustics Society ('70-), Member of the Audio Engineering Society ('91-); [Edu20], [Edu22], [Edu73]; [Pro4]; [MSc19], [MSc32]; [Pub33]; [Rep12]; [Con29]

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M.Sc. (98'), Ph.D. (2002); radio networks, heuristics methods, radiocommunications; Assistant Professor, Radiocommunications Division; [PhD5]; [Pro6]; [Pub119]

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M.Sc. ('70), Ph.D. ('80); microwa-ves, computer engineering, measurements; Assistant Profes-sor ('80-), Microwave and Radio-location Engineering Division; [Edu101]; [BSc4]

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M.Sc. ('75), Ph.D. ('86); measu-rement and instrumentation; Assistant Professor, Radio-Engineering Division; Head of the Computer-Aided Measure-ment Laboratory ('94-); Member of the Faculty Council ('93-); Member ('91-) and Secretary of the Dean's Financial Committee ('93-2002); Member of the Faculty Council Committee on Research (2002-); Member of the Education Section (94-) and the Measuring Systems Section (99'-) of the Metrology and Instrumentation Committee, Polish Academy of Sciences; Secretary ('93-2001) and deputy-chairman (2001-) of the Measurement Committee of the Polish Society for Measurement, Automatic Control and Robotics POLSPAR; Member of the Scientific Committee of the Conference SP'2002; team award of the Rector (2002); member of IEEE (2001-); [Edu12], [Edu13], [Edu14], [Edu58], [Edu84], [Edu101]; [Pro7], [Pro16], [Pro24]; [MSc6], [MSc26], [MSc28], [MSc37], [MSc53]; [BSc13]; [Pub3], [Pub8], [Pub18], [Pub24], [Pub63], [Pub80], [Pub101], [Pub102], [Pub122]; [Rep33], [Rep34]; [Con10], [Con16], [Con25], [Con40]

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M.Sc. Electronics ('66), M.A. Mathematics ('75), Ph.D. ('76), D.Sc. ('89); Professor ('93'); Prof. Title (2002); Radiocommuni-cations Division; signals and systems, radiocommunication, com-puter aided design, and networks, mathematical methods in engineering; Member of the Faculty Council ('98-); Head of the Faculty Council Committee on Scientific Research (2002-) Member of the University Council Committee on Scientific Research (2002-); Member of the Circuit Theory and Signal Processing Section of the Electronics and Telecommunication Committee of the Polish Academy of Science ('97-); Member of the Scientific Committee of: the International Conference on Signals and Electronics Systems ('97-), Conference on Evolutionary Algorithms and Global Optimization ('97-); Member of the Council of the Research and Promotion Center for Power Electronics ('97-), and of the Research Center for Automation and Information Technology (2000 -), Coordinator of the cooperation agreement between WUT and University of Waterloo, Canada ('93-), and WUT and Ohio University, USA ('97-); Adviser of Wydawnictwo Komunikacji i Łączności - a publishing house ('97-); [Edu52]; [Pro6]; [Prof1]; [PhD5]; [MSc63], [MSc66], [MSc75]; [Pub23]; [Rep35]; [Con13]

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M.Sc. ('79), Ph.D. ('86); antennae and antenna array; Assistant Professor, Radiocomunications Division; Member of IEEE ('97-); Member of the Organizing Committee of the International Conference TCSET'2002; [Edu54], [Edu76]; [Pro1], [Pro11], [Pro27]; [MSc44]; [Pub27], [Pub28], [Pub75], [Pub98], [Pub120], [Pub133], [Pub133]; [Rep20], [Rep21]; [Con2], [Con4]

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M.Sc. ('81), Ph.D. ('90); nuclear and medical electronics; Assistant Professor, Nuclear and Medical Electronics Division; Member of the FEIT Committee on Education ('99-2002); Head of the Digital Circuit Laboratory ('96-); Faculty Coordinator of European Programmes of Academic Collaboration ('99-2002), Member of the Faculty Council ('99-); Member of FEIT Joint Admission, Undergraduate and Graduate Committee ('91-2002); Unpaid Associate of CERN ('89-); Head of the Warsaw Branch of Polish Society of Medical Physics ('2001-); Deputy Director for Research (2001-); Secretary of the Dean's Financial Committee (2002-); [Edu31], [Edu45]; [Pro10], [Pro15], [Pro22], [Pro29]; [MSc47]; [BSc3], [BSc24]; [Pub14], [Pub15], [Pub29], [Pub45], [Pub46], [Pub91]; [Rep18], [Rep19], [Rep25], [Rep38]; [Con7], [Con17], [Con19]

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J.Zborowska@ire.pw.edu.pl

M.Sc. ('74), Ph.D. ('83); microwave technique; Assistant Professor ('83-), Microwave and Radiolocation Engineering Division; [Pro26]; [Pub94], [Pub95]; [Con23]

2.2. Junior academic staff

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Robert Łukaszewski, M.Sc.	Assistant *phone: 660-7340*
Piotr Nykiel, M.Sc.	Assistant *phone: 660-7637*

2.2.1. Ph.D. students

Fathi Ali Alwafie, M.Sc.
Sylwester Barański*), M.Sc.
Paweł Bargieł*), M.Sc.
Piotr Bilski*), M.Sc.
Piotr Bobiński, M.Sc.
Piotr Boniński*), M.Sc.
Tomasz Ciamulski*), M.Sc.
Grzegorz Galiński, M.Sc.
Artur Gałat, M.Sc.
Eryk Goś*), M.Sc.
Dariusz Grabowski, M.Sc.
Paweł Kącki*), M.Sc.
Tomasz Keller*), M.Sc.
Paweł Kopyt*), M.Sc.
Michał Kostrzewa*), M.Sc.
Dawid Koziński*), M.Sc.
Krzysztof Kucharski*), M.Sc.
Arkadiusz Kurek, M.Sc.
Robert Kurjata*), M.Sc.
Grzegorz Kustra*), M.Sc.
Piotr Łyszcz*), M.Sc.
Piotr Majchrzak*), M.Sc.
Jacek Marzyjanek, M.Sc.
Stanisław Maszczyk, M.Sc.
Artur Moryc, M.Sc.
Mariusz Mikołowicz*), M.Sc.
Nguyen Minh, M.Sc.
Cezary Niedziński, M.Sc.
Jacek Nowak*), M.Sc.
Dariusz Nowakowski*), M.Sc.
Piotr Nykiel, M.Sc.
Mateusz Orzechowski*), M.Sc.
Adam Padee*), M.Sc.
Marcin Piasecki, M.Sc.
Grzegorz Radzikowski*), M.Sc.
Andrzej Ritz, M.Sc.
Janusz Rudnicki*), M.Sc.
Ewa Snitkowska*), M.Sc.
Robert Sulej*), M.Sc.
Robert Szelenbaum*), M.Sc.
Rafał Szumny*), M.Sc.
Aneta Świercz*), M.Sc.
Arkadiusz Trojanowski*), M.Sc.
Artur Trybuła*), M.Sc.
Karol Wnukowicz, M.Sc..
Tomasz Wolak, M.Sc.
Anna Wróblewska*) M.Sc.
Sebastian Wydra*), M.Sc
Michał Zajączkowski, M.Sc.

*) the third-level studies

2.3. Technical and administrative staff

Aneta Bielska	Secretary *phone:660-7742,8253929*
Janina Chmielak	Senior Technician *phone: 660-7987*
Dariusz Ćwiek, M.Sc.	Senior Development Engineer *phone: 660-7577*
Tomasz Daniluk, M.Sc.	Development Engineer *phone: 660-7340*
Janina Gałęcka	Senior Accountant *phone: 660-7645*
Maciej Konwicki, M.Sc.	Head R&D Engineer *phone:660-7233,8253929*
Bogdan Kwiatkowski, M.Sc.	Senior R&D Engineer *phone: 660-5367*
Andrzej Laskowski	Worker *phone: 660-7957*
Mirosław Lubiejewski	Foreman *phone: 660-7633*
Marek Marcinkowski	Senior Foreman *phone: 660-7378*
Teresa Miąsek, M.Sc.	Curator of the Library *phone: 660-7627*
Danuta Morawska	Secretary *phone:660-7829,8255248*
Anna Noińska	Secretary *phone:660-7829,8255248*
Janina Nowak	Accountant *phone: 660-7743*
Helena Oleksak	Section Manager *phone:660-7957,8253769*
Andrzej Owczarek, M.Sc.	Senior Development Engineer - 0,5 *phone: 660-7793*
Krzysztof Robaczyński , M.Sc.	Senior R&D Engineer *phone: 660-7622*
Andrzej Skrzypkowski	Foreman *phone: 660-7378*
Tomasz Smakuszewski, M.Sc.	R&D Engineer *phone: 660-7840*
Hanna Szot	Accountant *phone: 660-7743*
Anna Tratkiewicz	Secretary *phone:660-7233,8253929*
Andrzej Wasilewski	Worker *phone: 660-7919*
Joanna Witkowska	Senior Technician *phone:660-7955,8251363*
Stanisław Żmudzin, M.Sc.	Senior R&D Engineer-0,5 *phone: 660-7635*

3. TEACHING ACTIVITIES (academic year 2001/2002)

3.1. Regular studies:
Areas of Concentrations

- **Radiocommunications and Multimedia Technologies**

Head
Tadeusz Morawski, D.Sc., Professor
room 541, phone +48(22)6607402
e-mail: T.Morawski@ire.pw.edu.pl

- **Biomedical Engineering**

Head
Zdzisław Pawłowski, D.Sc., Professor
room 65, phone +48(22)6607955, +48(22)8251363
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3.2. Basic courses

[Edu1] *Basics of Acoustics and Electroacoustics* (Podstawy akustyki i elektroakustyki - PAE); 3h/week; semester 6; A. Leszczyński, J. Narkiewicz-Jodko.

[Edu2] *Basics of High-Frequency Technique - Lab.* (Podstawy techniki w.cz. - TWCZ); 2h/week; semester 4; W. Wojtasiak.

[Edu3] *Basics of Microprocessor Technique* (Podstawy techniki mikroprocesorowej - TMIK); 4h/week; semester 5; K. Czerwiński.

[Edu4] *Basics of Programming M* (Podstawy programowania M - PRM); 4h/week; semester 1; A. Podgórski.

[Edu5] *Basics of Radiocommunications* (Podstawy radiokomunikacji - PR); 3h/week; semester 6; T. Kosiło.

[Edu6] *Basics of Television* (Podstawy telewizji - POTE); 3h/week; semester 6; A. Buchowicz.

[Edu7] *Computer Networks* (Sieci komputerowe - SKP1); 1h/week; semester 5; M. Sypniewski.

[Edu8] *Detection of Nuclear and Medical Signals* (Detekcja sygnałów biomedycznych i jądrowych - DSBJ); 4h/week; semester 6; Z. Pawłowski.

[Edu9] *Electronics III* (Elektronika III - ELKA III); 2h/week; semester 4; T. Olszewski.

[Edu10] *Fields and Waves* (Pola i fale - POFA); 3h/week; semester 3; T. Morawski, W. Gwarek.

[Edu11] *Materials, Components, and Designs* (Materiały, elementy i konstrukcje - MEIK); 1h/week; laboratory; semester 6; J. Cichocki.

[Edu12] *Measuring Systems* (Systemy pomiarowe - SPOM); 6h/week; semester 5; W. Winiecki.

[Edu13] *Measuring Systems I* (Systemy pomiarowe I - SPOM I); 4h/week; semester 5; W. Winiecki.

[Edu14] *Measuring Systems* II (Systemy pomiarowe II - SPOM II); 4h/week; semester 6; W. Winiecki.

[Edu15] *Medical Electronic Instrumentation* (Elektroniczna aparatura medyczna - EAME); 4h/week; semester 5 - 6; L. Padée.

[Edu16] *Numerical Methods (*Metody numeryczne - MNM); 3h/week; semester 3; R. Z. Morawski.

[Edu17] *Objects Programming (M)* (Programowanie obiektowe (M) - PROBI); 4h/week; semester 2; W. Smolik.

[Edu18] *Operating Systems* (Systemy operacyjne - SOP); 3h/week; semester 5; M. Sypniewski.

[Edu19] *Orientation 1* (Orientacja 1 - OR1); 1h/ week; semester 1; W. Gwarek.

[Edu20] *Orientation 2* (Orientacja 2 - OR2); 1h/week; semester 2; M. Tajchert, M. Mikołajewski, E. Piątkowska-Janko.

[Edu21] *Orientation 3* (Orientacja 3 - OR3); 1h/week; semester 3; E. Piątkowska-Janko.

[Edu22] *Orientation 4* (Orientacja 4 - OR4); 1h/week; semester 4; E. Piątkowska-Janko, M. Tajchert.

[Edu23] *Orientation 5* (Orientacja 5 - OR5); 1h/week; semester 5; J. Marzec J. Modzelewski.

[Edu24] *Orientation 6* (Orientacja 6 - OR6); 1h/week; semester 6; P. Brzeski.

[Edu25] *Programming 2* (Programowanie 2 - PROG2); 3h/week; semester 5; W. Smolik.

[Edu26] *Radiology and Nucleonics* (Radiologia z Nukleoniką - NK); 3h/week; semester 5; W. Scharf.

[Edu27] *Signals and Systems* (Sygnały i Systemy - SYS); 4h/week + laboratory; semester 3; K. Snopek.

[Edu28] *Theory of Signals and Modulations* (Teoria sygnałów i modulacji - TSIM); 3h/week + laboratory; semester 4; K. Radecki.

3.3   Advanced courses

[Edu29]   *Analysis and Synthesis of Microwave Circuits* (Analiza i synteza układów mikrofalowych - ASUM); 3h/week; elective; S. Rosłoniec.

[Edu30]   *Antennae and Radiowave Propagation* (Anteny i propagacja fal - AIPF); 3h/week; elective; J. Jarkowski.

[Edu31]   *Artificial Neural Networks in Medicine* (Sztuczne sieci neuronowe w medycynie - SESN); 2h/week; project: 1h/week; elective; K. Zaremba.

[Edu32]   *Basics of Loudspeakers Systems* (Podstawy urządzeń głośnikowych); 4h/week; elective; J. Narkiewicz-Jodko.

[Edu33]   *Basics of Medical Imaging Techniques* (Podstawy technik obrazowania w medycynie - PRIR); 4h/week; elective; P. Brzeski.

[Edu34]   *Basics of Multimedia Techniques* (Podstawy technik multimedialnych - PTMU); 3h/week; elective; K. Ignasiak.

[Edu35]   *Basics of Radiolocation and Navigation* (Podstawy radiolokacji i nawigacji - PRIR); 3h/week; elective; S. Rosłoniec.

[Edu36]   *Biomedical Accelerators* (Akceleratory biomedyczne - ABM); 2h/week; elective; W. Scharf.

[Edu37]   *Biomedical Signals Processing* (Cyfrowe przetwarzanie sygnałów biologicznych - CPSB); 4h/week; elective; W. Wierzejski.

[Edu38]   *Broadcasting Systems* (Systemy radiofoniczne - SYR); 3h/week; elective; H. Chaciński.

[Edu39]   *Cable Television* (Telewizja przewodowa - TVP); 3h/week; elective; J. Modelski.

[Edu40]   *Computer Systems* (Systemy komputerowe - SYKO); 3h/week; elective; T. Jamrógiewicz.

[Edu41]   *Computed Tomography* (Tomografia komputerowa - TOM); 4h/week; elective; W. Smolik.

[Edu42]   *Contemporary Applications of Microwaves* (Współczesne zastosowania mikrofal - WZN); 3h/week; elective; K. Derzakowski.

[Edu43]   *Data Compression* (Kompresja danych - KOPA); 3h/week; elective; A. Przelaskowski.

[Edu44]   *Digital Audio Signal Processing* (Cyfrowe przetwarzanie sygnałów fonicznych - CPSF); 3h/week; elective; Z. Kulka.

[Edu45]   *Digital Circuits - Laboratory* (Układy logiczne; laboratorium - ULOGE); 2h/week; laboratory; semester 4; K. Zaremba.

[Edu46]   *Digital Image Processing* (Cyfrowe przetwarzanie obrazów - CPOO); 4h/week; elective; M. Kazubek.

[Edu47]   *Digital Information Transmission* (Cyfrowa transmisja informacji - CTIN); 3h/week, project: 1h/week; elective; T. Buczkowski.

[Edu48]   *Digital and Interactive Television Systems* (Telewizja cyfrowa i interaktywna - TCI); 4h/week; elective; K. Ignasiak.

[Edu49]   *Electromagnetic Compatibility* (Kompatybilność elektromagnetyczna - KE); 2h/week; elective; W. Gwarek.

[Edu50]   *Electromagnetic Field Theory* (Teoria pola elektromagnetycznego - TPE); 4h/week; elective; T. Morawski.

[Edu51]   *Fields, Waves and Antennae* (EFWA); 4h/week; elective; M. Celuch-Marcysiak.

[Edu52]   *Graphs and Networks* (Grafy i Sieci - GIS); 2h/week; project: 2h/week; elective; J. Wojciechowski.

[Edu53]   *GSM and Third Generation Cellural Systems* (GSM i systemy komórkowe trzeciej generacji - GSMS); 4h/week; elective; J. Kołakowski.

[Edu54]   *Influence of Electromagnetic Waves on Living Organisms* (Oddziaływanie fal elektromagnetycznych na organizmy żywe - OFA); 2h/week; elective; Y. Yashchyshyn.

[Edu55]   *Information Technologies in Medical Image Diagnostics* (Techniki informacyjne w medycznej diagnostyce obrazowej - TIM); 4h/week; elective; P. Bogorodzki.

[Edu56]   *Measured Data Analysis in Medicine* (Analiza danych pomiarowych w medycynie - ADP); 3h/week; elective; Z. Pawłowski.

[Edu57]   *Measurements in Radiocommunications* (Pomiary w radiokomunikacji - PRAD); 3h/week; elective; J. Cichocki.

[Edu58]   *Measuring Systems Software* (Oprogramowanie systemów pomiarowych - OSP); 4h/week; elective; W. Winiecki.

[Edu59]   *Methods and Algorithms for Processing of Measurement Signals* (Metody i algorytmy przetwarzania sygnałów pomiarowych - MAP); 3h/week; elective; A. Miękina.

[Edu60]   *Methods and Equipment for Organ Structure Visualisation* (Metody i urządzenia do wizualizacji struktur narządowych - MWSN); 3h/week; elective; R. Szabatin.

[Edu61]   *Mobile Radio Communications* (Radiokomunikacja ruchoma lądowa - RRL); 3h/week; elective; T. Kosiło.

[Edu62]   *Multi-service and Multimedia Networks*; 4h/week; elective; K. Puczko.

[Edu63]   *Noise Control* (Ochrona przed hałasem); 2h/week; elective; E. Kotarbińska.

[Edu64]   *Nuclear Medicine Techniques* (Techniki medycyny nuklearnej - TMN); 4h/week; elective; R. Szabatin.

[Edu65] *Object Oriented Programming of Distributed and Multimedia Applications in Java* (Java - obiektowe programowanie aplikacji rozproszonych i multimedialnych - OPA); 3h/week; elective; K. Ignasiak.

[Edu66] *Power Supply of Electronic Instruments* (Zasilanie urządzeń elektronicznych - ZUE); 3h/week; elective; M. Mikołajewski.

[Edu67] *Radioelectronics Measurements* (Miernictwo radioelektroniczne - MR); 3h/week; elective; J. Cichocki.

[Edu68] *Radio Transmitting Technique and its Applications (*Technika nadawania radiowego i jej aplikacje - TNR); 4h/week; elective; J. Modzelewski.

[Edu69] *Satellite Communications* (Łączność satelitarna - ŁS); 3h/week; elective; J. Modelski.

[Edu70] *Semantic Analysis of Images and Sounds* (Analiza semantyczna obrazu i dźwięku - ASOD); 3h/week; elective; W. Skarbek.

[Edu71] *Signal Processors and their Applications* (Procesory sygnałowe i ich zastosowania - PS); 4h/week; elective; K. Czerwiński.

[Edu72] *Software for Medical Systems* (Oprogramowanie systemów medycznych - OSM); 3h/week; elective; W. Smolik.

[Edu73] *Sound Recording and Forming* (Odbiór i kształtowanie dźwięku - OKD); 3h/week; elective; M. Tajchert.

[Edu74] *System Measuring and Controlling Devices* (Systemowe urządzenia pomiarowe i sterujące - SUPS); 4h/week; elective; K. Mroczek.

[Edu75] *Technique of a Radio Receiving* (Technika odbioru radiowego - TOR); 2h/week; elective; W. Kazubski.

[Edu76] *Theory and Designing of Antennae* (Teoria i projektowanie anten - TPA); 4h/week; elective; Y. Yashchyshyn.

[Edu77] *Ultrasonography Instrumentation* (Aparatura ultrasonograficzna - AUS); 3h/week; elective; L. Padee.

3.4. Special courses

3.4.1. Engineering Evening Studies on Radiocommunications

[Edu78] *Antennae* (Anteny - ANR); 34h/sem.; semester 4; S. Rosłoniec.

[Edu79] *Basics of Computer Techniques* (Podstawy techniki komputerowej - PTKR); 70h/sem.; semester 1; T. Jamrógiewicz, J. Marzec.

[Edu80] *Basics of Digital Circuits and Microprocessing Technique* (Podstawy układów logicznych i techniki mikroprocesorowej - PULR); 55h/sem.; semester 4; K. Czerwiński.

[Edu81] *Basics of High-Frequency Techniques* (Podstawy techniki w.cz. - PTWR); 65h/sem.; semester 3; K. Kowalski.

[Edu82] *Basics of Metrology* (Podstawy metrologii - PMER); 40h/sem.; semester 1; J. Olędzki.

[Edu83] *Basics of Satellite Communications* (Podstawy łączności satelitarnej - SATR); 20h/sem.; semester 4; J. Modelski.

[Edu84] *Computer-Aided Controlling and Data Processing* (Komputerowe sterowanie i przetwarzanie danych - KSTR); 41h/sem.; semester 5; W. Winiecki.

[Edu85] *Digital Data Transmission* (Cyfrowa transmisja danych - CTSR); 43h/sem.; semester 5; T. Kosiło.

[Edu86] *Fields and Waves* (Pola i fale - PFR); 72h/sem.; semester 2; T. Morawski.

[Edu87] *Frequency Standards* (Wzorce częstotliwości - WCR); 32h/sem.; semester 7; K. Radecki, T. Buczkowski.

[Edu88] *Materials and Elements* (Materiały i elementy - MER); 16h/sem.; semester 4; K. Radecki.

[Edu89] *Multimedia Techniques* (Techniki multimedialne - TMR); 20h/sem.; semester 6; K. Ignasiak.

[Edu90] *Numerical Methods* (Metody numeryczne - MNR); 35h/sem.; semester 3; A. Miękina.

[Edu91] *Programmable Digital Systems* (Programowalne układy cyfrowe - PUCR); 32h/sem.; semester 5; T. Buczkowski, T. Olszewski.

[Edu92] *Programming* (Programowanie - PMR); 32h/sem.; semester 3; W. Smolik.

[Edu93] *Project 1 (systemic)* (Projekt 1- układowy - PUR); 30h/sem.; semester 5; K. Kowalski.

[Edu94] *Propagation of Waves* (Propagacja fal - PFR); 16h/sem.; semester 4; J. Jarkowski.

[Edu95] *Radioelectronics Measurements* (Miernictwo radiolektroniczne - MRR), 42h/sem.; semester 5; J. Cichocki.

[Edu96] *Radiocommunication Systems I* (Systemy radiokomunikacyjne I - SRK); 36h/sem. + lab. 3h + proj. 15 h; semester 6; T. Kosiło.

[Edu97] *Radiocommunication Systems II* (Systemy radiokomunikacyjne II - SRK); 36h/sem. + lab. 3h + proj. 15 h; semester 7; T. Kosiło.

[Edu98] *Technique of Emission and Receiving* (Technika emisji i odbioru - TER); 40h/sem.; semester 4; J. Modzelewski, W. Kazubski.

[Edu99] *Transmitters and Receivers Measurements* (Pomiary nadajników i odbiorników - PNOR); 32h/sem.; semester 7; J. Cichocki.

3.4.2. Postgraduate Studies on Radiocommunications

[Edu100] *Basics of Fiber Optics Telecommunications* (Podstawy telekomunikacji światłowodowej - PTS); 20h; J. Siuzdak.

[Edu101] *Computer Controlled Measurement and Data Processing* (Komputerowe sterowanie i przetwarzanie danych - KSP); 28 h + lab. 9h; A. Więckowski, W. Winiecki.

[Edu102] *Contemporary Telecommunication Networks* (Współczesne sieci telekomunikacyjne - WST); 20h; M. Dąbrowski.

[Edu103] *Digital Signal Transmission* (Cyfrowa transmisja sygnałów - CTS); 28h; T. Kosiło.

[Edu104] *Digital Cellular Systems* (Cyfrowe systemy komórkowe - CSK); 16h; J. Cichocki, J. Kołakowski.

[Edu105] *Digital Signal Processing* (Cyfrowe przetwarzanie sygnałów - CPS); 16h; A. Jakubiak.

[Edu106] *Law in Telecommunications* (Prawo w telekomunikacji - PT); 20h; C. Woźniak.

[Edu107] *Modern Radiocommunication and Broadcasting Systems* (Współczesne systemy radiokomunikacyjne i radiofoniczne - WRR); 32h; T. Kosiło.

[Edu108] *Modern Telecommunication Networks* (Współczesne sieci telekomunikacyjne - WST); 20h; M. Dąbrowski.

[Edu109] *Radio Links and Satellite Communications* (Linie radiowe i łączność satelitarna - LR); 20h; J. Zygierewicz.

[Edu110] *Theory of E-M Fields and Microwaves* (Problemy teorii pola i techniki mikrofalowej - PTM); 20h; K. Kowalski.

[Edu111] *Wide - band Systems in Telecommunications* (Systemy szerokopasmowe w telekomunikacji - SST); 16h; A. Dąbrowski.

3.4.3. Studies on Radiocommunications, Multimedia Techniques and Biomedical Engineering "RADEM"

[Edu112] *Access Network Systems* (Systemy i sieci dostępu - SSD); 3x18h, three times a year; T. Kosiło, A. Kalinowski.

[Edu113] *Access Network xDSL* (Systemy dostępowe xDSL); 8x19h; eight times a year; J. Brożyna, S. Kula, A. Kalinowski.

[Edu114] *Digital Broadcasting and Television Systems* (Cyfrowe systemy radiofoniczne i telewizyjne); 20h; once a year; T. Kosiło, H. Chaciński, T. Krzymień.

[Edu115] *Internet Telephony VoIP* (Internetowa telefonia VoIP); 18h; once a year; M. Bromirski.

[Edu116] *Measurement Capabilities and Operation of FSP-30 Spectrum Analysers* (Możliwości pomiarowe i obsługa analizatorów widma FSP-30); 10h + 16h lab.; once a year; J. Cichocki, J. Kołakowski.

[Edu117] *Measurements of Synchronous and Plesiochronous Telecommunication Systems* (Pomiary synchronicznych i plezjochronicznych systemów telekomunikacyjnych); 2x12h; twice a year; S. Kula, K. Perlicki, A. Kalinowski.

[Edu118] *NGN New Generation Networks* (Sieci nowej generacji NGN); 12h; once a year; M. Bromirski, S. Kula.

[Edu119] *Optical Telecommunication DWDM Systems and their Measurements* (Optyczne systemy telekomunikacyjne DWDM i ich pomiary - DWDM); 12h; once a year; K. Perlicki.

[Edu120] *Optical Waveguide Construction* (Budowa sieci światłowodowej); 1x18h; once a year; K. Holejko, K. Perlicki, R. Chojnacki, W. Szkil.

[Edu121] *Planning and Designing of Telecommunication Networks* (Planowanie i projektowanie sieci telekomunikacyjnych - PPST); 18h; once a year; S. Kula, A. Drobnik, G. Giermakowski.

[Edu122] *Protocols of Modern Packet Networks - TCP/IP and ATM* (Protokóły nowoczesnych sieci pakietowych - TCP/IP i ATM); 5x24h; five times a year; M. Bromirski.

[Edu123] *Systems and SDH Networks* (Systemy i sieci SDH - SSDH); 3x24h + lab. 6h; three times a year; S. Kula, K. Radecki.

[Edu124] *System of Signalling No.7* (System sygnalizacji nr 7 - SS7); 4x18h; four times a year; M. Bromirski.

3.4.4. Studies on Audiological Techniques

The Studies on Audiological Techniques represent a series of courses; 180h; twice a year.

[Edu125] *Anatomy and Physiology of Hearing* (Anatomia i fizjologia słyszenia); 12h.

[Edu126] *Ear Pathology* (Patologia ucha); 9h.

[Edu127] *Fundamentals of Acoustics* (Podstawy akustyki); 20h.

[Edu128] *Audiometry* (Audiometria); 32h.

[Edu129] *Hearing Aid Technology and Elements of Electronics* (Technika aparatów słuchowych i elementy elektroniki); 30h.

[Edu130] *Hearing Aid Measurements* (Miernictwo aparatów słuchowych); 14h.

[Edu131] *Earmold Technics* (Wkładki douszne); 5h.

[Edu132] *Hearing Aid Fitting* (Dobór aparatów słuchowych); 34h.

[Edu133] *Aural Rehabilitation* (Rehabilitacja); 7h.

[Edu134] *Elements of Psychology* (Elementy psychologii); 6h.

[Edu135] *Sign Language* (Język gestów); 6h.

3.5. International co-operation

[Edu136] SOCRATES Programme: **Higher Education**.
T. Kosiło, Ph.D., T. Buczkowski, Ph.D.
1999-2002

In the frame of SOCRATES Institutional Contract two bilateral programmes were realised: between Institute of Radioelectronics of Warsaw University of Technology and:

- Katholieke Hogeschool Sint – Lieven, Gent, Belgium
- Instituto Superior Tecnico, Universidade Tecnica de Lisboa, Lisboa, Portugal

In both cases the Student Mobility actions were realised in the frame of Electronics and Telecommunication Engineering (Socrates code 06.05). The objective of the programme is to realize a student project at the partner University. The Student Mobility programme was as follows:

- Poland-Portugal; two students for 6 months
- Poland-Belgium; two students for 4 months
- Belgium-Poland two students for 4 months

In the frame of cooperation with Belgium there was also realised a "teaching staff mobility of short duration action" (Socrates code 06.05).

- Belgium-Poland; one lecturer for one week
- Poland-Belgium; one lecturer for one week

4. RESEARCH PROJECTS

4.1. Projects granted by the University

Statutory projects

[Pro1]   **Analysis and Designing of New Type of Antennae** (Analiza i projektowanie nowych rodzajów anten).
Józef Modelski, Prof., D.Sc.,
Y. Yashchyshyn, K. Derzakowski, M. Pia-secki, W. Sadowski
27.06.2001 - 30.04.2002

In modern radio systems smart beam-forming is often required. Communications antennae must offer a large number of operating modes (including pencil and shaped beams with fast switching between them) in order to ensure the best coverage of the service area. Therefore, in designing smart antennae, one of the main challenges is to provide a prescribed shaped antenna pattern that simultaneously suppresses interference signals (which locations are either known or unknown).

The aim of this project is to elaborate a new method of array pattern synthesis by taking into consideration pattern of each radiator, especially of the ferroelectric one. The new method of pattern synthesis of antenna arrays without phase shifters and attenuators have been presented. This concept is based on utilizing voltage-controlled ferroelectric array, where variable pattern of each antenna element is used to synthesize array pattern. As a rule, this problem is solved with the use of phased-array antennae. This type of array consists of multiple stationary antenna elements, which are fed coherently and use variable phase or time-delay control at each element to scan the beam to given angles in space. Variable amplitude control is sometimes also provided for pattern shaping. Performance of each radiating element has significant influence on the parameters of antenna array. Reducing the cost of phased array antennae has recently become the subject of considerable interest. In this project the design of a low-cost antenna array with steering capability has been proposed.

[Pro2]   **Design, Modelling and Measuring the Microwave Devices** (Projektowanie, modelowanie i pomiary układów mikrofalowych).
Tadeusz Morawski, Prof., D.Sc.,
W. Wojtasiak, W. Gwarek, S. Rosłoniec, K. Robaczyński
27.06.2001 - 30.04.2002

• *Microwave receiver subcircuits design*
The all receiver subcircuits of C-band T/R module for active phased array radar have been designed and manufactured. The receiver consists of circulator, limiter, two switches and LNA. The obtained parameters of the receiver are:
band 5,3÷5,9GHz, Gain>25dB, Noise Figure<3dB, Max input power 4W.

• *Switched multiports for scattering matrix measurement*

A measurement system for determination of scattering parameters of microwave two-ports has been elaborated and experimentally examined. The system uses microwave five-port with phase shifters (reflection and transmission ones). This system is much simpler than typical dual-six-port one.

• *S-parameter extraction algorithms applicable to circuit segmentation*
This work has been concerned with the generalised S-matrices defined in mutlimodal waveguiding structures and in the presence of evanescent modes. Such generalised S-matrices allow circuit segmentation being closed to discontinuities and cascade the full circuit characteristics from the separately simulated subcircuits. This accelerates the process of microwave circuit design, especially if only these parts of the whole structure are being modified, or if a high-Q resonant structure can be decomposed into non-resonant parts.

A unified theory of the generalised S-matrices has been developed. It is based on a novel definition of power waves, consistent with Maxwell equations and applicable to modes of imaginary wave impedance. Additionally, numerical errors that may compromise the accuracy of S-parameter extraction from FDTD simulations on non-uniform meshes have been revealed, and effective measures for their suppression have been proposed.

• *The sectorial rectangular horn antenna integrated with the metal accelerating lens*
The novel algorithms for designing the sectorial rectangular horns and accelerating waveguide lens are presented. The S-band model of the antenna under investigation will be tested as a subject of the master thesis being prepared.

• *Testing of the autopilot models*
The paper presents a new concept of autopilot universal unit. The design is based on microprocessor circuit and micromechanical sensors. In the project were utilized results of testing the KRUG, KUB and OSA missiles.

[Pro3]   **Implementation and Investigation of the Selected Algorithms for Interpretation of Measurement Data** (Realizacja i badanie wybranych algorytmów interpretacji danych pomiarowych).
Roman Z. Morawski, Prof., D.Sc.,
A. Miękina, A. Podgórski, T. Szafrański
27.06.2001 - 30.04.2002

The main objectives of the project are related to the design and implementation of new algorithms for calibration of measurement channels and reconstruction of measurands, as well as to the design of the procedures for uncertainty analysis of those algorithms, and to the upgrading of the corresponding research infrastructure. A new systematic approach to the classification and analysis of the algorithms for quasi-dynamic calibration of measurement channels and measurand reconstruction has been proposed. A class of new algorithms for mini-spectrophotometer calibration, referring to the use of a tunable laser for acquisition of reference data and neural networks for data processing, has been developed. Some

new algorithms and new instruments for frequency-domain analysis of acoustic-range signals have been designd and studied as well. The results of the research accomplished have been published in several papers.

[Pro4] **Design and Investigation of Electro-acoustic Measuring Systems and Digital Audio Signal Processing Systems** (Projektowanie i badania systemów elektroakustycznych oraz systemów cyfrowego przetwarzania sygnałów fonicznych).
Zbigniew Kulka, Prof., D.Sc.,
A. Leszczyński, M. Tajchert, J. Narkiewicz-Jodko, P. Nykiel
27.06.2001 - 30.04.2002

Primary topics included in the statutory grant are as follows:
- design, construction and investigation of four-channel soundfield type microphone;
- design and investigation of laboratory acoustic measuring system integrated with local area computer network;
- design and investigation of laboratory acoustic system for equal-loudness contours determination;
- design, computer simulation and implementation of the different length digital FIR filters and investigation of subjective perceived quality CD reproduced sound in the function of their characteristics;
- design and investigation of room acoustic correction system based on digital adaptation FIR filter implemented on DSP with LMS gradient of adopted algorithm.

[Pro5] **Multimedia Home Platform in Cable TV Network** (Domowa platforma multimedialna w systemie telewizji kablowej).
Andrzej Buchowicz, Ph.D.,
T. Keller, R. Pączkowski, B. Staniszewski, K. Dudało
27.06.2001 - 30.04.2002

A laboratory set for data transmission in cable TV network composed of devices donated by the ARRIS company has been arranged and configured within the scope of the project. DHCP/TFT necessary for cable modem termination system has been prepared. Java application allowing access to the mail server from the http browser has been written. It can serve as a base for a full-scale application for cable TV user, which can be used for the provisional network access, provisioning and other services. Additionally, data streaming with Jame Media Framework and RTP protocol has been tested.

[Pro6] **Digital Radiocommunications** (Cyfrowa transmisja radiowa).
Jacek Wojciechowski, Prof., D.Sc.,
J. Cichocki, J. Kołakowski, K. Radecki, S. Żmudzin, D. Grabowski, S. Maszczyk, T. Kosiło, T. Buczkowski, K. Czerwiński, W. Kazubski, D. Janusek, F. Alwafie, J. Jarkowski, H. Chaciński, Z. Walczak
27.06.2001 - 30.04.2002

In the frames of this work four study problems were analysed:
- Problems and methods for measurements of UMTS radio interface signals;
- Short range radio links, research and applications;
- Generalized eigenoscillation method in investigation of open and closed resonators;
- Methods of conflict solving in packet radio networks.

The first problem is concerned with the measurements of UMTS radio signals. The scope of the project included: analysis of standards concerning measurement methods and requirements, formulation of basic requirements to be fulfilled by measurement equipment, evaluation of Radiocommunication Laboratory capabilities and specifiation of needs and directions of equipment basis development. The measurement arrangement allowing for generation of signals with WCDMA signal features was developed. The project resulted in extension of didactic offer and research capabilities.

The second problem was concerned with short-range radio links. The method of indoor propagation measurements was prepared and some measurements were realised. The works on software tool for indoor propagation prediction were started as well. The problem of short-range radio compatibility with another equipment was analysed. The measurement methods for RRL unit's influence on medical electronic equipment was developed and tested. The system for improving the blind orientation was analysed. Typical data transmission links were developed as a student diploma. The journal and conference papers were prepared as a result of this study.

The generalized method of eigenoscillations (GMEO) is a development method of eigenfrequencies (MEF). In GMEO different physical parameters (among such as dielectric permittivity of the limited body, impedance or transparency of resonator boundary, elements of the scattering matrix etc.) can be a spectral parameter occurs as an eigenvalue in the homogeneous problems, and is connected with a complete system of the eigenfunctions. The method turned out to be a very effective technique for investigation of closed and open resonators, in particular in the case of occurrence of losses in the dielectric bodies or impedance and semitransparent boundaries.

The last fourth problem was oriented on methods of conflict analysis in digital packet radio networks. The graph theory was used to solve these problems. It was shown that graph-colouring algorithms could be useful in such applications. Some computer simulations were developed to test proposed algorithms. The PhD dissertation is a result of this study.

[Pro7] **Modern Methods of Computer Measuring Systems Designing** (Nowoczesne metody projektowania komputerowych systemów pomiarowych).
Wiesław Winiecki, Ph.D.,
K. Adamowicz, P. Bilski, R. Leoniak, R. Łukaszewski, J. Nowak
27.06.2001 - 30.04.2002

The methodology of designing of virtual instruments with the use of integrated program environments was developed. Possibilities of time optimisation of virtual oscilloscopes and virtual spectrum analysers functioning were investigated. Application of modern program technologies and communication technologies for distributed measuring systems designing were considered. Comparative analysis of teaching measuring systems at various technical universities was carried out. The results of the work were presented in one book and six conference papers.

[Pro8] **Analysis and Development of Distributed Database Applications** (Analiza i projektowanie rozproszonych aplikacji bazodanowych).
Krystian Ignasiak, Ph.D.,
K. Cichoń, K. Wnukowicz, M. Ceremuga, A. Żołądkiewicz, J. Januszkiewicz
27.06.2001 - 30.04.2002

The EbXML standard (and its family: UDDI /WSDL/SOAP) were analyzed. As an example application of the mentioned standards the presenting press notes on the Internet was implemented based on UDDI registry. The stress tests of WebSphere application server were conducted (horizontal and vertical scaling). An educational system for electronic learning on the Internet was projected and implemented. A bibliographic study of face detection algorithms for face databases was finished and registered to local conference.

[Pro9] **Optimisation and Designing Methods of High-frequency Tuned Power Amplifiers** (Optymalizacja i metody projektowania rezonansowych wzmacniaczy mocy wielkiej częstotliwości).
Jan Ebert, Prof., D.Sc.,
M. Mikołajewski, J. Modzelewski, K. Puczko, A. Wajs
27.06.2001 - 30.04.2002

The research project concerns two groups of high-frequency tuned power amplifiers namely switch-mode high-efficiency amplifiers and classic analogue amplifiers. The new procedure for designing the switch-mode Class-DE (Class-D-ZVS) tuned power amplifiers has been worked out. It is an application of the Class-DE amplifier analysis that has been done using the first-harmonic method. The graphic method for designing the electron-tube analogue Class-B, Class-AB and Class-A linear tuned power amplifiers has been improved. The graphic method has also been adapted for designing the transistor analogue Class-B, Class-AB and Class-A tuned power amplifiers. The proposed method has been experimentally verified using a laboratory model of the transistor analogue tuned power amplifier (35W) which can operate at the frequency 1MHz in Class C, Class B, Class AB and Class A. The measured parameters and characteristics of this amplifier are in good agreement with their theoretical predictions. The results of theoretical analysis and experiments have been published in two conference papers.

[Pro10] **Radiation Methods in Medical Techniques** (Metody radiacyjne w technikach medycznych).
Zdzisław Pawłowski, Prof., D.Sc.,
J. Marzec, K. Zaremba, B. Konarzewski, A. Piątkowski, G. Domański, P. Bogorodzki, E. Piątkowska-Janko, T. Wolak, M. Kazubek, T. Jamrógiewicz, A. Przelaskowski, L. Padee, R. Szabatin, P. Brzeski, W. Smolik, T. Olszewski
27.06.2001 - 30.04.2002

- *Investigation of light transport in luminescent sensors for radiographic imaging*

In this research the relation between light transport process and parameters of radiographic sensors was investigated. The aim of this work was investigation of dependence of detective quantum efficiency (DQE), point spread function (PSF) and modulation transfer function (MTF) on light scatter anisotropy, types of sensor internal reflection and sensor surface mass. Mathematical models of sensors processes - the X-ray and light transport equations were formulated, as well. These equations were used for establishing relation between sensor surface mass and its parameters: detective quantum efficiency, point-spread function and modulation transfer function. There was also presented the sensor features dependence on light diffusion and comparison of results taking into account analytical methods and Monte Carlo simulation.

- *System for simultaneous registration and analyses of high resolution ECG signals*

A construction of modern equipment for registration of signals in high resolution ECG with a proper signal for noise ratio, frequency response, sampling frequency and amplification was the main purpose of this research study.

- *Visualization techniques in three-dimensional USG examination*

The goal of this project was to search such methods of performing sonomammographic examination, which lead to easy comparison with X-ray mammography. Both research methods (mammography and sonomammography) were complementary. In order to choose the methods of measurement space visualisation useful in ultrasonography the analytical works were performed. Various modes of measurement space visualisation applied to diagnostics were analysed, too. The original cone-projection algorithm was developed either by ray-tracing or casting-rays methods. It should be used in ultrasonographic examination and help to compare their results with X-ray pictures. There was developed a programme that takes advantage of X-ray cone-projection algorithm to cast the results of volumetric researches. Additionally, there was designed a phantom used to parameter selection of measurement space scanning, optimal for sonomammographic examination. Phantom supported by additional marks visible in X-ray will be used to develop various techniques of medical imaging.

- *Acquisition, reconstruction and visualization of tomographic (SPECT) images on the basis of Omega 500 gammacamera*

Selected parts of a modern computer system for acquisition and processing of tomographic studies, done by means of the Omega 500 rotating gammacamera have been designed and practically made. In particular, an acquisition interface as an additional card for PC computer in ISA data-way standard, enabling 300.000 events per second collection has been constructed. It was designed on the basis of fast A-C converters (Analog Device) and programmable circuits (Altera) with a FIFO buffer. The acquisition circuit is equipped with non-linearity correction of A-C converters of the sliding scale type. As a result of the work a driver for the interface was elaborated, which enables the Windows system to be used as an environment for programming. The driver makes it possible to acquire the real - time data in a multi-task system. The programme for the camera rotating movement control and for planar tomographic projections acquisition as well as for tomographic image reconstruction has also been elaborated. It was made in a Visual C^{++} programme environment.

Projects granted by the Rector

[Pro11] **New Generation of Microwave Ferro-electric Materials for Modern Radio-communications** (Nowa generacja ferro-elektryków mikrofalowych dla nowo-czesnej radiokomunikacji).
Józef Modelski, Prof., D.Sc.,
M. Szafran, Y. Yashchyshyn, K. Derza-kowski, E. Bobryk
25.09.2001 - 31.05.2002

Pulse method for microwave measurement of the ceramic-polymer materials parameters has been developed. Additionally, ceramic-polymer composite substrates with modified ferroelectric powder $Ba_{0,65}Sr_{0,35}TiO_3$ and accordant polymer (there were grains the powder sprayed at specific method into polymer) have been investigated. This powder $Ba_{0,65}Sr_{0,35}TiO_3$ has been synthesized at the temperature range $1150\text{-}1350^oC/3h$ and admixture (from 0,5% to 3%) of oxides of nickel or manganese or iron have been added. The ferroelectric powder after being granulated (into grinder) according to desired size ($1\text{-}5\mu m$) has been utilized to obtain ceramic-polymer films. The substrates of the ceramic-polymer composite have been designed such that volume of the ferroelectric powder was from 75% to 97,5%. Volume of the polymer was at the range from 2,5 to 25% in spite of the composite layer thickness (100 to 500 μm).
Some kind of composite polymer with desired parameters has also been investigated. The main parameters of the composite are mechanical resistance and flexibility. This permits to operate easily with obtained substrate and overcoat it onto conductive plane. The polystyrene and polyvinyl butyral are the best among many investigated polymers.
The proposed pulse method for microwave measurement of the ceramic-polymer material parameters bases on measurement of the pulse delay t after pulse passed of the microstrip line fragment. This substrate of the microstrip line is

realized with ferroelectric material. The utilization of this pulse method makes this pulse delay defined without its connection to mcrostrip, but it does not permit to assign a loss.
Because permittivities of the investigated materials are primarily unknown, this way might be very useful. Microstrip line can be matched and the losses can be determined by changing pulse magnitudes.
Obtained results (e.g. tuning ability coefficient of the effective permittivity) show that ceramic-polymer substrate can be utilize in order to design new type of antennae and microwave devices.

[Pro12] **Statistic Methods of Medical Images Processing and Estimation** (Staty-styczne metody przetwarzania i oceny obrazów medycznych).
Roman Szabatin, Ph.D.,
W. Smolik, D. Radomski
1.02.2002 - 31.12.2002

The aim of this work was the critical analysis of published, statistical algorithms for PET images reconstructions and expert systems used for computer aided diagnostic in radiology. The theoretical analysis obeyed the following groups of reconstruction methods: algorithms based on maximum likelihood, Bayesian methods, based on neural networks and wavelet transform.

Projects granted by the Dean

[Pro13] **Application of Time-frequency Transforms and Software Radio Techniques for Analysis of Broadband Radio Emissions** (Wykorzystanie prze-kształceń czasowo - częstotliwościowych i technik odbiornika programowego (soft-ware radio) do analizy szerokopas-mowych emisji radiowych).
Jerzy Kołakowski, Ph.D.,
J. Cichocki, D. Grabowski, S. Maszczyk
27.06.2001 - 31.05.2002

The project consists of software procedure development for evaluation of broadband emission parameters and detection and demodulation of selected classes of emissions as well as development of the site for radio emission measurements. Within the frames of the project the procedures for measurements of the following parameters were developed: power measurement, amplitude probability distribution, complementary cumulative distribution function, instantaneous frequency. Methods for instantaneous frequency estimation were based on wavelet frames. All procedures were tested with the use of AWGN, CW, and FM signals. A specialized module for signal acquisition interoperating with Texas Instruments DSP modules and A/C modules was also designed, built and tested.

[Pro14] **Radio Identification Systems** (Radiowe systemy identifikacyjne (RFID).
Tomasz Kosiło, Ph.D.,
D. Janusek
27.06.2001 - 31.05.2002

This work is concerned with RFID (Radio Identification) systems sending data from tag to reader using air radio interface. Such systems will replace simple and dangerous systems based on magnetic strip. Modern RFID systems are able to write date to tag and process data inside the tag's microcontroller as well. The subject of this work is to recognize the up to date situation on the RFID "market" (e.g. latest research, technology development and possible applications), and to do the laboratory models of selected RFID systems.

[Pro15]   **Design of the Integrated Circuit for the Read-out System of Gas Detectors Used in the High-Energy Physics Experiments** (Opracowanie scalonego układu odczytu danych z detektorów gazowych dla eksperymentów fizyki wysokiej energii).
Krzysztof Zaremba, Ph.D.,
Z. Pawłowski, J. Marzec, B. Konarzewski, G. Domański, E. Piwowarska, W. Pleskacz, A. Jarosz, A. Wałkanis
27.06.2001 - 31.05.2002

The project is on the design of fully functional model of the integrated circuit for the "front-end-electronics" of straw chambers - group of radiation detectors widely used in the high-energy physics experiments. This chip, called IRIMIO, consists of eight independent, identical channels. Each of them contains a charge preamplifier, "tail cancellation" circuit, base-line restorer and discriminator. The chip is optimised in terms of the signal to noise level and separation of analog and digital part. Problem of technological dispersion of the chip parameters is also considered.

[Pro16]   **Methods and Tools for Increasing Effectiveness of Wireless Environment Monitoring Systems** (Opracowanie metod i środków zwiększenia efektywności bezprzewodowych systemów monitorowania środowiska).
Wiesław Winiecki, Ph.D.,
A. Płatonow, K. Jędrzejewski, H. Chaciński, R. Leoniak, R. Łukaszewski
27.06.2001 - 31.05.2002

Basis of theoretical apparatus for analysis and optimisation of intelligent wireless environment monitoring systems, as a complex of co-operating data acquisition, transmission and visualisation, was developed. Comprehensive simulation analysis of new system of transmission data from radiosensor to base station was carried out. The distinguished feature of the new approach is an *adaptive,* iterative method of signal samples transmission with the use of qualitative channel "base station – sensor" and algorithms for estimation of transmitted samples with simultaneous *optimal adaptive adjusting* of radiosensor's transmitter. The results of research showed a possibility of significant extension of transmission range for cheap in the price and simple AM transmitters, integrated with radiosensors, without the application of the correcting codes. The results of the work were presented at two international conferences (IDAACS 2003, ICSES 2002).

[Pro17]   **Data Acquisition and Tomographic Image Reconstruction Based on Gamma Camera OMEGA 500** (Akwizycja i rekonstrukcja obrazów tomograficznych SPECT na bazie gammakamery Omega 500).
Waldemar Smolik, Ph.D.,
R. Szabatin, P. Brzeski, T. Olszewski
27.06.2001 - 31.05.2002

The devices and software for measurement of tomographic data using Omega 500 gammacamera were elaborated in this project. The data acquisition electronics was modernized and new reconstruction method was applied. The acquisition electronics in the form of PC ISA extension board was designed and tested. Fast analog to digital converters and Altera programmable devices were used. The acquisition board enables high – count rate and performs hardware correction of ADC nonlinearity. The device driver for acquisition board for Windows NT/2000 was elaborated. This software enables real time data acquisition in multitask system. The main problem was to minimize the driver dead time and to counteract counts losses. The software for gamma-camera control and tomographic projection was worked out. The software was written in C++ using Visual Studio environment. The existing software for image reconstruction was adapted for using in this project. The images were reconstructed using NMS system – elaborated previously in the Laboratory of Electronics Application in Nuclear Medicine. The NMS system enables reconstruction using the FBP algorithm with Chang's attenuation correction and ML-EM iterative algorithm. The results of this work are tools for SPECT study. The elaborated tools will be used in other projects performed at our laboratory. It will allow starting research in the domain of registration and fusion of multimodal tomographic imaging – fusion of CT and SPECT images.

[Pro18]   **A Stand for Investigation of Electromagnetic Fields Using "Human Dummy"** (Stanowisko do badania pól elektromagnetycznych z wykorzystaniem "sztucznego człowieka").
Tomasz Buczkowski, Ph.D.,
D. Janusek, B. Murzynowski
25.06.2001 - 31.05.2002

An artificial human being has been built according to the ETSI Technical Report ETR 273-7:1998. A Salty-Lite type has been chosen which comprises two concentric plastic cylinders. The space between cylinders is filled with saline solution (NaCl). Special conductometer and electronic thermometer have been built fot the purpose of Salty-Lite verification. Two different circuits for saline solution conductance measurement have been designed - one based on RFID technology and another - based on external measurement. Fully operational Salty-Lite will be used in futher research and measurements of influence of human body on personal (body - worn) radio equipment characteristics infrequency band 150 to 1000 MHz, covering popular ISM and cellular bands and optionally in the 70 to 150 MHz band, covering VHF broadcasts and paging systems.

[Pro19] **Investigation and Optimization of 1-and Few-Bit Dithered Delta-Sigma Modulators for Digital Audio Applications** (Badania symulacyjne i optymalizacja modulatorów delta - sigma z ditherowanymi kwantyzatorami przeznaczonymi do cyfrowych systemów fonicznych).
Zbigniew Kulka, Prof., D.Sc.,
P. Nykiel, R. Ulinowicz
25.06.2001 - 31.05.2002

The project presents results of computer simulations of 1-bit and few-bit dithered delta-sigma modulators of 1-st, 2-nd, 3-rd and 7-th order. Simulations were focused on determination of required level of the dither signal with triangular probability density function (tpdf). Such a signal should be added to the audio signal before the quantizer to eliminate the harmonic distortion components and idle tones. An optimum level of the dither signal is its minimum value at which the undesired nonlinear artifacts are removed from the frequency range of interest. As a main conclusion, it has been shown, that in the highly oversampled delta-sigma systems for which quantization error of the low-bit quantizers is feedback the optimum tpdf dither level can be significantly lower than the optimum dither level derived from PCM theory for linearization of the multi-bit quantizers.

[Pro20] **Computer Model of Caesium Lamp in Caesium Frequency Standard** (Model komputerowy lampy cezowej w cezowym wzorcu częstotliwości).
Karol Radecki, Ph.D.,
D. Wasiak, A. Moryc
25.06.2001 - 31.05.2002

The main goal of this work is to construct a three-dimensional model of caesium lamp for the purpose of computer designing. The analysis of caesium standard features has been developed as well.

4.2. Projects granted by the State Committee for Scientific Research (KBN)

[Pro21] **Algorithms for Digital Signal Processing of Measurement Data, Dedicated to Applications in Environmental and Industrial Monitoring** (Algorytmy cyfrowego przetwarzania danych pomiarowych dla zastosowań w monitoringu środowiska naturalnego i w monitoringu przemysłowym).
Roman Z. Morawski, Prof., D.Sc.,
A. Miękina, A. Podgórski
10.12.1999 - 30.06.2002

New methods and algorithms of digital signal processing of measurement data have been developed. They are designed for solving some fundamental problems related to the development of information infrastructure of environmental and industrial monitoring, such as:
– expanding the set of measurable quantities;

– improving the resolution, accuracy, speed or reliability of measuring quantities important for monitoring;
– decreasing the costs of instrumentation via its specialisation or software substitution of its hardware.

The developed procedures for measurand reconstruction and calibration of measurement channels, make it possible to analyse multicomponent substances, *i.e.* to determine the estimates of concentrations, as well as uncertainties of those estimates, on the basis of spectrophotometric data or data provided by selected sensors and transducers used in monitoring. The results of the research accomplished have been presented in several papers.

[Pro22] **Optimisation of Radiographic Imaging Sensors Dedicated for Osteoporosis Diagnostics** (Optymalizacja sensorów obrazów do radiograficznych systemów obrazowania przeznaczonych do diagnozowania osteoporozy).
Janusz Marzec, Ph.D.,
Z. Pawłowski K. Zaremba, B. Konarzewski, G. Domański, E. Demczuk
14.07.2000 - 30.06.2002

The purpose of this work was to select cheap and effective techniques of bone mineral density measurement using scintillating detectors. Theoretical analysis of bone mineral measurement by absorptiometry was presented in the work. The applicability of two potential systems for forearm bones screening was checked: the first one using digitized radiographs and the second one using linear scanner with scintillating head optically coupled with matrix of semiconductor photodiodes. The optimization of each system was made by means of theoretical analysis and experiment, taking the minimization of radiation dose for fixed precision as the main criterion of the optimization.

[Pro23] **Analysis of Wideband Properties of the Indoor Propagation Channel in Wireless Communication Systems** (Analiza szerokopasmowych właściwości kanału propagacyjnego wewnątrz budynków w systemach łączności bezprzewodowej).
Józef Modelski, Prof., D.Sc.,
K. Kurek
01.02.2001 - 31.03.2002

The analysis of the indoor propagation channel, based on measurements and ray tracing simulations, has been used to determine dependence of the channel properties on scenario conditions such as: dimensions of the room, location and kind of antennae, existence of visibility between antennae for situation when both antennae are placed in the same room. Using results of the analysis statistical model of the channel impulse response considering influence of propagation scenario has been proposed. Model bases on an exponential approximation of envelope of the

average impulse response and dependence of slope factor on scenario conditions.

[Pro24] **Application of Novel Software and Communication Technologies in Distributed Virtual Instruments Design** (Wykorzystanie nowoczesnych technologii programowych i komunikacyjnych w projektowaniu sieciowych, wirtualnych przyrządów pomiarowych).
Wiesław Winiecki, Ph.D.,
A. Podgórski, T. Kosiło, R.Łukaszewski, M.Karkowski, P. Bilski, R. Leoniak
01.08.2001 - 30.07.2003

The project concerns application of novel software and communication technologies in metrology. Main activity is focused on new kind of measuring virtual instruments, named distributed (or network) virtual instruments. Such instruments can be controlled via wire or wireless networks. The main objectives of the project are related to application of novel software tools, such as: integrated environments (e.g. LabView, Measurement Studio, HPVEE), Java, C+SCPI, Data Socket, ActiveX, HTML, XML, WML, Flash, i.e.), and novel wire and wireless communication technologies, such as: Internet, GSM, GPRS, WAP, UMTS, Bluetooth, Wireless Ethernet, i.e., in distributed virtual instruments designing.

[Pro25] **Improved Model of Adaptive Antenna Controlled by Means of Genetic Algorithm** (Badanie anten inteligentnych sterowanych algorytmem genetycznym).
Marcin Piasecki, M.Sc.,
01.08.2001 - 30.07.2002

This project presents results of research on the influence of real antenna parameters like mutual couplings on the overall antenna radiation pattern. Two different approaches to adaptation of such antenna simulated with the use of genetic algorithm are also presented. The first one is a standard phase adaptation while in the second one radiation characteristic of each element is modified with new hardwareless technique.

[Pro26] **Design of High-Power Microwave Amplifiers Regarding the Newest Achievements of Semiconductor Technology** (Projektowanie mikrofalowych wzmacniaczy dużych mocy z uwzględnieniem najnowszych osiągnięć technologii półprzewodników).
Tadeusz Morawski, Prof., D.Sc.,
W. Wojtasiak, J. Zborowska, D. Gryglewski, R. Michnowski, M. Kukier, M. Lubiejewski
02.04.2001 - 31.12.2002

Chosen types of high-power microwave amplifiers regarding the newest achievements of semiconductor technology have been designed and experimentally examined.

[Pro27] **New Kinds of Steerable Microwave Antenna with Multilayer Substrate** (Nowe rodzaje sterowanych anten mikrofalowych na podłożu wielowarstwowym).
Józef Modelski, Prof., D.Sc.,
1.03.2002 - 28.02.2004
Y. Yashchyshyn, M. Szafran, K. Derzakowski, E. Bobryk, H. Chaciński, M. Piasecki, A. Mędrzak, A. Tomaszewska-Grzęda

New kinds of steerable microwave antenna with multilayer substrate have been investigated. The multilayer substrate consists of thin ferroelectric tape sandwiched between dielectric slabs. Ferroelectric tape is made up of ferroelectric material which permittivity can be changed by applying and varying the dc electric field. The permittivity change enables to create different radiation patterns of microstrip antenna. This permits to use such substrate in several applications.

[Pro28] **Double - Dimensional Cohen's Class Distributions. Studies of Properties and Applications** (Podwójnie wymiarowe rozkłady klasy Cohena. Badania własności oraz zastosowań).
Stefan L. Hahn, Prof., D.Sc.,
6.05.2002 - 31.12.2004
J. Jarkowski, K. Snopek, G. Hahn

The double-dimensional Cohen's class was defined in the paper of Hahn and Snopek (IEEE Transactions on Signal Processing, November 2002). The further research contains the studies of properties of chosen double-dimensional distributions, especially double dimensional pseudo-Wigner distributions. A special attention will be focused on applications of double-dimensional spectrograms and signograms.

[Pro29] **COMPASS Experiment at CERN - Design of the Apparatus, Collecting and Analysis of Data** (Eksperyment COMPASS w CERN-ie - Budowa aparatury, zbieranie i analiza danych).
Krzysztof Zaremba, Ph.D.,
Z. Pawłowski, J. Marzec, B. Konarzewski, G. Domański, A. Padee, R. Sulej
01.01.2001 - 31.12.2003

The project is a part of the long-term collaboration between the Institute of Radioelectronics and the international high-energy physics experiment COMPASS (Na58) at CERN (Genewa). The project deals with the design and optimisation of the straw chambers, which are the main component of the large area tracking system in the experiment, as well as, with the design of the read-out electronics for these detectors. Group from the Institute is also responsible for the performance of chambers and electronics in terms of the noise and electromagnetic interference pick up. The Institute is also involved in the applications of the „soft computing" methods (neural networks, genetic algorithms etc.) in the experimental data analysis.

[Pro30] **Perfusion Monitoring System for Controlling of Surgical, Interventional and Pharmacological Treatments** (System monitorowania perfuzji podczas zabiegów chirurgicznych interwencyjnych i farmakologicznych).
Piotr Bogorodzki, Ph.D.,
A. Piątkowski, E. Piątkowska-Janko

01.01.2001 - 31.12.2003
EUREKA project No. 2427

The goal of the project is to design a radiological imaging system capable of quantitatively monitoring organ flow/perfusion. This information is essential for the improvement of several surgical (including minimal invasive intervention procedures) and pharmacological treatment techniques so that they will be generally less costly and less traumatic to the patient, involving smaller incisions, less pain, and shorter hospital stays.

[Pro31] **Microwave Thawing Optimisation Software to Strengthen the Competitiveness of Food Industry and Software Companies** (Opracowanie oprogramowania do optymalizacji procesu mikrofalowego rozmrażania i grzania żywności pod kątem poprawy jakości i bezpieczeństwa mikrobiologicznego).
Wojciech Gwarek, Prof., D.Sc.,
W. Wojtasiak, R. Michnowski, D. Gryglewski, P. Kopyt
EUREKA project No. 2602
01.01.2001 - 01.01.2004

The overall objective of the project is to develop innovative, industrially evaluated software tools for real-time simulation and optimization of microwave thawing and heating of frozen convenience food and methods - based on this unique software - for finding the optimal design of such food products.

4.3 Other projects

[Pro32] **Analysis and Testing of Board Equipment Before Fire Tests and Design of Programme and Methodology** (Przeprowadzenie analizy i badań aparatury pokładowej (AP1) rakiet przeciwlotniczych KRUG przed próbami poligonowymi).
Krzysztof Kowalski, Ph.D.,
2.08.2002 - 26.08.2002

Project developed in cooperation with the Military Institute of Armament Technology (Wojskowy Instytut Techniczny Uzbrojenia).

[Pro33] **Recording and Processing of Sound Materials in Electroacoustics Division** (Przeprowadzenie nagrań oraz wykorzystanie urządzeń i aparatury do obróbki dźwięku).
Zbigniew Kulka, Prof., D.Sc.,
26.02.2002 - 28.02.2002
Fund by Central Examination Commission (Centralna Komisja Egzaminacyjna)

The sound materials in a very high level of speech intelligibility (foreign languages) were recorded processed and edited in Electroacoustics Division (ZEA) studio and anechoic chamber.

[Pro34] **Acoustic and Electroacoustic Measurements of Noise Emitted by Computer Systems** (Pomiary akustyczne i elektroakustyczne dźwiękowych urządzeń komputerowych).

Zbigniew Kulka, Prof., D.Sc.,
Axel Springer Polska, Ltd.
2.02.2002 - 30.12.2002

The aim of the work was to use advanced electroacoustic measuring systems to noise level evaluation, which was emitted by different computer systems.

[Pro35] **The Programme Basis for Hearing Instruments Specialist Education** (Podstawa programowa kształcenia w zawodzie protetyk słuchu).
Andrzej Leszczyński, Ph.D.
2.07.2002 - 25.11.2002
Fund by Ministry of National Education and Sport (Ministerstwo Edukacji Narodowej i Sportu)

The aim of the work was to elaborate a basis for the education process in the newly introduced profession of the hearing aids specialist. The project delivered the foundations for the post-secondary schools educating in this occupation, in the form of the blocks of modules and their contents.

[Pro36] **The Education Programme for Hearing Instruments Specialist** (Program nauczania zawodu protetyk słuchu).
Andrzej Leszczyński, Ph.D.
1.08.2002 - 25.11.2002
Fund by Ministry of National Education and Sport (Ministerstwo Edukacji Narodowej i Sportu).

The project developed the previously formulated basis into detailed object programmes for educating the hearing aids specialists. The programme was to be wide applied in Poland at the post-secondary school level.

[Pro37] **Design of the Technical Documentation and Two Prototypes of Multi-channel Electronic Capacitance Meter for Oil, Water, Gas and Solid Suspension Separation Study** (Opracowanie dokumentacji technicznej oraz wykonanie dwóch prototypowych egzemplarzy wielokanałowego, pojemnościowego układu pomiarowego do badania procesów w przepływowym separatorze mieszaniny ropy, gazu, wody i zawiesiny stałej).
Roman Szabatin, Ph.D.
3.06.2002 - 30.11.2002
Fund by MIKROMAX Ltd.

The aim of this project was to elaborate the technical documentation of multichannel electronic capacitance meter in order to confirm the suitable conditions of its work.

[Pro38] **C Band T/R Modules Design and Construction** (Opracowanie i wykonanie modeli modułów nadawczo-odbiorczych na pasmo C).
Wojciech Wojtasiak, Ph.D.
D. Gryglewski, M. Lubiejewski,
R. Michnowski
1.07.2002 - 30.11.2002
Fund by Industrial Institute of Telecommunications (Przemysłowy Instytut Telekomunikacji).

The goal of this project was to use high-tech semiconductor technology for designing microwave active circuits. Application of new components required working out methods for designing C band T/R module. It was the main subject of this work.

[Pro39] **L Band Up-Converter Design** (Opracowanie modułu up-conwertera na pasmo L).
Wojciech Wojtasiak, Ph.D.
D. Gryglewski, M. Lubiejewski, R. Michnowski
2.09.2002 - 30.10.2002
Fund by Microwave Systems Poland Ltd.

The Institute of Radioelectronics has not responsibility for obtaining any intellectual property rights of issued research results to be performed for the Microwave Systems Poland Ltd.

4.3.a. International co-operation

[Pro40] **Implementation of the H26L Coder Based on Equator Technology** (Implementacja kodera H26L na platformie Equator)
Władysław Skarbek, Prof., D.Sc.,
S. Badura, P. Bobiński, A. Buchowicz, P. Buczyński, A. Dawidziuk, P. Daniluk, G. Galiński, M. Łempkowski, K. Ignasiak, T. Keller, M. Mazurek, J. Modelski, R. Pączkowski, D. Siemek
15.01.2002 - 31.12.2002
Fund by Arris Lisle, USA

The aim of the project was to implement H26L coder based on Equator reference platform. The coder has met the most recent version of approved draft of standard. The coder was prepared in Java and then migrated into Equator architecture. The Equator's code was implemented and optimized.

5. TITLES AND DEGREES AWARDED

5.1. Professor Titles

[Prof1] Jacek Wojciechowski - promoted to a tenured professor (19 Apr. 2002).

5.2. Ph.D. Degrees

[PhD1] Krzysztof Kurek: *"Analiza szerokopasmowych właściwości kanału propagacyjnego wewnątrz budynków w systemach łączności bezprzewodowej"* (Analysis of wideband properties of the indoor propagation channels in wireless communication systems), Prof. **J. Modelski** (tutor), Warsaw, 10 Sept. 2002.

[PhD2] Krzysztof Mroczek: *"Realizacje sprzętowe algorytmów estymacji ruchu oraz kodowania tekstury obrazu metodami transformacji ortogonalnych"* (Hardware for movement estimation algorithms and image texture coding by means of methods based on orthogonal transformations), Prof. **J. Modelski** (tutor), Warsaw, 18 Jun. 2002 (honours).

[PhD3] Kajetana Snopek: *"Rozkłady klasy Cohena sygnałów wielowymiarowych i ich zastosowania"* (Cohen's class distributions of multi dimensional signals and their applications), Prof. **S. Hahn** (tutor), Warsaw, 11 Jun. 2002.

[PhD4] Andrzej Wajs: *"Rezonansowe przetworniki energii wielkiej częstotliwości z regulatorami synchronicznymi"* (Resonant h.f. converters with synchronous regulators), Prof. **J. Ebert** (tutor), Warsaw, 14 Mar. 2002.

[PhD5] Zbigniew Walczak: *"Metody rozwiązywania konfliktów pakietowych w sieciach radiowych"* (Methods for solving conflicts in packet radio networks), Prof. **J. Wojciechowski** (tutor), Warsaw, 25 Jun. 2002.

5.3. M.Sc. Degrees

[MSc1] Wiktor Adamski: *"Rozpoznawanie pisma ręcznego w czasie rzeczywistym"* (On-line handwriting recognition), Assist. Prof. **K. Ignasiak** (tutor), (4,5).

[MSc2] Stanisław Tomasz Badura: *"Efektywność kodeka H.264"* (Coding efficiency of the emerging H.264 video coding standard), Prof. **W. Skarbek** (tutor), (5).

[MSc3] Jerzy Błąd: *"Modelowanie warunków akustycznych w sali nagrań Zakładu Elektroakustyki z wykorzystaniem pakietu CATT-ACOUSTIC"* (Modelling of acoustic conditions in a room studio of Electroacoustics Division with use of CATT - Acoustic package), Assist. Prof. **A. Leszczyński** (tutor), (5).

[MSc4] Piotr Boniński: *"Analiza i implementacja metod rozpoznawania wzorów dźwiękowych w czasie rzeczywistym"* (Analysis and implementation of real - time methods of sound pattern recognition), Prof. **W. Skarbek** (tutor), (5).

[MSc5] Mariusz Borowski / Tomasz Pawełek: *"Radiowy system transmisji danych w paśmie ISM"* (Broadcasting data transmission system at ISM band), Assist. Prof. **T. Kosiło** (tutor), (5).

[MSc6] Rafał Ursyn Brona: *"Rozproszony system pomiaru czasu operacji wykorzystujący protokoły HTTP WAP oraz technologię ASP"* (Dispersal system measuring the operation time based on HTTP WAP protocols and ASP technology), Assist. Prof. **W. Winiecki** (tutor), (4,5).

[MSc7] Paweł Bujak: *"System alarmowy wykorzystujący odbiornik GPS i mechanizm SMS dostępny w telefonii GSM"* (Alarm system which uses GPS receiver combined with SMS service provided by GSM telephony), Assist. Prof. **K. Czerwiński** (tutor), (4).

[MSc8] Mirosław Ceremuga: *"Zastosowanie Javy i XML do budowy usług internetowych"* (The application of Java and XML standards to web services), Assist. Prof. **K. Ignasiak** (tutor), (4,5).

[MSc9] Mirosław Ciechanowicz: *"Układ polaryzacji elementów mikrofalowych w podsystemie badawczego oscylatora przyrządu hi-fi"* (DC bias circuits for microwave devices in the local oscillator subsystem of the hi-fi instrument), Assist. Prof. **K. Derzakowski** (tutor), (5).

[MSc10] Dariusz Depko: *"Mikrofalowy wzmacniacz 200 do nadajnika IFF"* (Microwave amplifier 200 for IFF transmitter), Assist. Prof. **W. Wojtasiak** (tutor), (5).

[MSc11] Robert Dudzik: *"Projekt automatycznego systemu informacji głosowej (IVR) zrealizowany na platformie CISCO AS5300 / Voice Gateway"* (Project of automatic voice information system (IVR) realised on CISO AS5300 / Voice Gateway platform), Assist. Prof. **T. Kosiło** (tutor), (5).

[MSc12] Bartłomiej Filipski: *"Sterownik urządzeń peryferyjnych wykorzystujący interfejs PCI local bus"* (Peripherals controller based on PCI interface), Assist. Prof. **T. Kosiło** (tutor), (5).

[MSc13] Anna Gałecka: *"Program kliniczny wspomagający ocenę perfuzji nerek na podstawie dynamicznych badań scyntygraficznych"* (Clinical application supporting evaluation of renal blood flow on the ground of scintigraphy based on dynamic acquisition), Assist. Prof. **P. Brzeski** (tutor), (5).

[MSc14] Maciej Garniewski: *"Układ sterowania pracą generatora lokalnego w projekcie Herschel"* (Work control system of a local generator in Herschel project), Assist. Prof. **K. Derzakowski** (tutor), (4,5).

[MSc15] Arkadiusz Glinka: *"Analiza możliwości zastosowania wzmacniacza mocy klasy DE do budowy nagrzewnicy indukcyjnej"* (Analysis of the use of the class DE tuned power amplifier for induction heating), Assist. Prof. **J. Modzelewski** (tutor), (5).

[MSc16] Wojciech Giergusiewicz: *"Bezprzewodowe łącze transmisji danych"* (Wireless data link transfer between computer systems), Assist. **T. Jamrógiewicz** (tutor), (5).

[MSc17] Artur Gombosz: *"Cyfrowe łącze ultra-krótkofalowe (2FSK)"* (Digital UHF connection (2FSK)), Assist. **H. Chaciński** (tutor), (4).

[MSc18] Grzegorz Horba / Robert Kępczyk: *"Stanowisko laboratoryjne do pomiaru stężeń tlenku węgla i dwutlenku węgla oraz mikroprocesorowy miernik wielogazowy"* (The laboratory stand for oxygen, carbon monoxide, carbon dioxide concentrations measurement and microprocessory), Assist. Prof. **P. Bogorodzki** (tutor), (5).

[MSc19] Paweł Jerzak: *"Badania nieliniowych aparatów słuchowych"* (Investigations of nonlinear hearing aids), Assist. Prof. **M. Tajchert** (tutor), (4,5).

[MSc20] Marek Kawczyński: *"Hurtownia danych w telemedycznym systemie kontroli jakości"* (Warehouse of telemedical data in quality control system), Assist. Prof. **A. Przelaskowski** (tutor), (4,5).

[MSc21] Jacek Kordula: *"Dynamiczna generacja dokumentów z wykorzystaniem XSLT"* (Dynamic data presentation by means of XSLT), Assist Prof. **A. Buchowicz** (tutor), (3,5).

[MSc22] Mariusz Kowalczyk: *"Aplikacje standardu J2EE na serwerze aplikacyjnym BEA WebLogic"* (Applications in J2EE standard on application server BEA WebLogic), Assist Prof. **K. Ignasiak** (tutor), (4).

[MSc23] Adam Kozłowski: *"Wielofunkcyjny wirtualny blok pomiarowy z interfejsem IEC-625"* (Multifunctional virtual measuring block with IEC-625 interface), Assist. Prof. **K. Adamowicz** (tutor), (4).

[MSc24] Emil Kozłowski: *"Badanie właściwości akustycznych nauszników przeciwhałasowych w warunkach rzeczywistych"* (Research of earmuffs acoustic properties in real conditions), Assist. Prof. **E. Kotarbińska** (tutor), (5).

[MSc25] Marcin Królikowski: *"Obrazowanie multimodalne - opracowanie metody przestrzennego dopasowania danych obrazowych"* (Multimodal imaging - design of method for space fitting of imaging data), Assist. **T. Jamrógiewicz** (tutor), (4).

[MSc26] Krzysztof Krupa: *"Projekt rozproszonego systemu pomiarowego w środowisku Agilent VEE60 z wykorzystaniem telefonii GSM i protokołu WAP"* (Distributed measuring system designing in Agilent VEE60 environment using GSM telephony and WAP protocol), Assist. Prof. **W. Winiecki** (tutor), (5).

[MSc27] Łukasz Kulig: *"Programowy translator protokołów RCTM→USEP działający w systemie DARC/SWIFT"* (Software version of RTCM→USEP protocols translator working in DARC/SWIFT system), Assist. Prof. **K.Czerwiński** (tutor), (4,5).

[MSc28] Albert Kuran: *"Wykorzystanie telefonii komórkowej GSM oraz technologii WAP i ASP w rozproszonych systemach pomiarowych"* (The usage of GSM systems, WAP and ASP technologies in distributed measuring systems), Assist. Prof. **W. Winiecki** / Assist. **R. Łukaszewski** (tutors), (5).

[MSc29] Arkadiusz Kurek: *"Głosowy system orientacji terenowej dla osób niewidomych "Nawigator""* (Project of system for field navigation for blind persons), Assist. Prof. **K. Czerwiński** (tutor), (5).

[MSc30] Piotr Majchrzak: *"Radiometryczny system monitorowania podstawowych wskaźników czynności życiowych pacjentów na terenie szpitalastacja bazowa"* (Radiotelemetry vital signs monitoring systembase station), Assist. Prof. **T. Buczkowski** (tutor), (5).

[MSc31] Tomasz Malec: *"Uniwersalny moduł komunikacyjny z transmisją GPRS"* (Universal communication module with GPRS transmission), Assist. Prof. **T. Buczkowski** (tutor), (5).

[MSc32] Tomasz Malus: *"Projekt i realizacja centralnego zespołu głośnikowego w systemie kina domowego"* (Designing and construction of the central speaker in the home cinema sound system), Assist. Prof. **M. Tajchert** (tutor), (5).

[MSc33] Witold Małek: *"Pomiary nadajników DECT z wykorzystaniem wektorowego analizatora sygnałów"* (DECT transmitters measurements with the Vector Signal Analyzer), Assist. Prof. **J. Cichocki** (tutor), (5).

[MSc34] Paweł Markowski: *"Analiza pracy rezonansowego wzmacniacza mocy klasy DE w warunkach nieoptymalnych"* (Analysis of class - DE tunned power amplifier in nonoptimum conditions), Assist. Prof. **J. Modzelewski** (tutor), (5).

[MSc35] Paweł Matuszkewicz: *"Podsystem elektrycznego wspomagania testów aparatury naukowo-badawczej wynoszonej w przestrzeń kosmiczną* (Electrical ground support equipment), Assist. Prof. **K. Derzakowski** (tutor), (4,5).

[MSc36] Maciej Matysiak: *"Wydajność serwisów WWW na platformie Javy"* (The performance of WWW services on the Java platform), Prof. **W. Skarbek** (tutor), (4,5).

[MSc37] Tomasz Mielcarz: *"Zintegrowane środowisko programowe do projektowania rozproszonych systemów pomiarowych"* (Integrated programming environment for designing distributed measuring systems), Assist. Prof. **W. Winiecki** (tutor), (5).

[MSc38] Radomir Miturski: *"Minimalizacja zmian transmitancji mikrofalowych wzmacniaczy nadawczych"* (Minimalization of transmittance changes in microwave amplifiers), Assist. Prof. **W. Wojtasiak** (tutor), (5).

[MSc39] Marcin Molenda: *"Obrazowanie multimodalne - opracowanie algorytmów i metod prezentacji"* (Multimodal imaging - designing of algorithms and methods of presentation), Assist. **T. Jamrógiewicz** (tutor), (5).

[MSc40] Piotr Muniak: *"Zastosowanie radioizotopowej rentgenowskiej analizy fluorescencyjnej do badania składu sensorów luminescencyjnych"* (Application of Roentgen radioisotopic fluorescent analysis for investigations of luminescent sensors contents), Prof. **Z. Pawłowski** (tutor), (4,5).

[MSc41] Dariusz Nerkowski: *"Skaner scyncylacyjny do badań gęstości tkanek kostnych"* (Scintillating scanner for bone density screening), Prof. **Z. Pawłowski** (tutor), (4,5).

[MSc42] Andrzej Niczyporuk: *"Wzmacniacz sterujący o mocy 30W do systemu precyzyjnego grzania mikrofalowego"* (30W power amplfier for precise microwave heating system), Assist. Prof. **W. Wojtasiak** (tutor), (5).

[MSc43] Grzegorz Nocek: *"Układ przetwarzania a/c i c/a do cyfrowej obróbki sygnału wizyjnego"* (Processing system for a/c and c/a digital convertion of visual signal), Prof. **J. Modelski** / Assist. **T. Smuszewski** (tutors), (4,5).

[MSc44] Michał Nowak: *"Analiza i synteza charakterystyki promieniowania paskowych szyków antenowych na podłożu ferroelektrycznym"* (Analysis and synthesis of ferroelectric antenna arrays), Assist. Prof. **Y. Yashchyshyn** (tutor), (5).

[MSc45] Dariusz Nowakowski: *"Model interfejsu radiowego systemu UMTS"* (Radio interface model for UMTS), Assist. Prof. **T. Kosiło** (tutor), (5).

[MSc46] Wojciech Olbryś: *"Ultrasonograficzny dopplerowski miernik prędkości przepływu krwi z transmisją danych przy użyciu magistrali USB"* (Ultrasound Doppler blood flowmeter with data transmission by means of USB bus), Assist. Prof. **P. Bogorodzki** (tutor), (4,5).

[MSc47] Adam Padee: *"Implementacja sieciowa algorytmu genetycznego w zastosowaniach optymalizacyjnych w fizyce eksperymentalnej"* (Network implementation of genetic algorithm in optimization applications in experimental physics), Assist. Prof. **K. Zaremba** (tutor), (5).

[MSc48] Krzysztof Pawlak: *"Projekt części odbiorczej radiowego toru transmisji danych w paśmie VHF/UKF"* (Project of radio receiver in UHF/VHF), Assist. Prof. **W. Kazubski** (tutor), (4,5).

[MSc49] Rafał Pawlak: *"Sprzętowy translator protokołów RTCM SC-104/USEP działający w systemie DARC/SWIFT"* (Hardware RTCM SC-104/USEP translator of protocols functioning in DARC/SWIFT system), Assist. Prof. **K. Czerwiński** (tutor), (5).

[MSc50] Dariusz Pieniak: *"Generator VCO do syntezera częstotliwości na pasmo"* (VCO generator to frequency synthetizer at band), Assist. Prof. **W. Wojtasiak** (tutor), (5).

[MSc51] Wojciech Pieńkowski: *"Generacja i analiza sygnałów z modulacją QAM i OFDM"* (Genaration and analysis of signals with modulation QAM and OFDM), Assist. Prof. **K. Radecki** (tutor), (5).

[MSc52] Marcin Pilarski: *"Generator sygnału EKG oparty o interfejs szeregowy USB"* (ECG signal generator on USB interface), Assist. Prof. **E. Piątkowska-Janko** (tutor), (4,5).

[MSc53] Michał Piórkowski: *"Integracja rozproszonych systemów pomiarowo-kontrolnych z wykorzystaniem standardu Bluetooth"* (The integration of distributed measuring systems using Bluetooth standard), Assist. Prof. **W. Winiecki** (tutor), (5).

[MSc54] Paweł Radomyski: *"Projekt, analiza i wykonanie przedwzmacniacza lampowego klasy hi-fi"* (Project, analysis and designing of audio hi-fi preamp), Prof. **Z. Kulka** (tutor), (4,5).

[MSc55] Wojciech Rosłoniec: *"Dwukanałowa zwrotnica antenowa dla systemów telefonii komórkowej GSM 1800 i UMTS"* (Two-channel diplexer for GSM 1800/UMTS mobile telephony system), Prof. **S. Rosłoniec** (tutor), (5).

[MSc56] Konrad Sadecki: *"Projekt, symulacja i realizacja fonicznego wzmacniacza lampowego mocy w konfiguracji dual - mono"* (Project, simulation and realization of audio valve power amplifier in dual-mono configuration), Prof. **Z. Kulka** (tutor), (4).

[MSc57] Marek Skakuj: *"Koder obrazów według standardu JPEG2000 do zastosowań internetowych"*, (Codec JPEG2000 for internet application), Assist. Prof. **A. Przelaskowski** (tutor), (5).

[MSc58] Paweł Skurak: *"Turbokody - nowe techniki kodowania sygnałów cyfrowych"* (Turbocodes - the new techniques of digital signals encoding), Assist. Prof. **J. Jarkowski** (tutor), (4).

[MSc59] Jarosław Sobierski: *"Multimedialna metabaza danych indeksowana zawartością"*

(Contents indexed multimedia database), Prof. **W. Skarbek** (tutor), (5).

[MSc60] Przemysław Socha: *"Radiotelemetryczny system monitorowania podstawowych wskaźników czynności życiowych pacjentów na terenie szpitala - terminal"* (Radio-telemetry system for monitoring basic vital signs of patients within hospital area - terminal), Assist. Prof. **T. Buczkowski** (tutor), (5).

[MSc61] Andrzej Spława-Nejman: *"Analiza zmiennej adaptacji akustycznej wnętrza sali nagrań studia dźwiękowego Zakładu Elektro-akustyki"* (Adjustable acoustic adaptation of the interior of sound studio recording room), Assist. Prof. **A. Leszczyński** (tutor), (4).

[MSc62] Łukasz Starakiewicz-Zawiślak: *"Rezo-nansowa przetwornica napięcia stałego z prostownikiem synchronicznym klasy D_{ZVS}"* (A resonant dc/dc converter with a synchronous class D_{ZVS} rectifier), Assist. Prof. **M. Mikołajewski** (tutor), (4).

[MSc63] Michał Szczepaniak: *"Zastosowanie analizy różnicowej i analizy rozkładu prawdo-podobieństwa jako metod wykrywania nadużyć w sieciach telefonii komórkowej"* (Application of differential analysis and probability distribution analysis to fraud combating in mobile telecommunication networks), Prof. **J. Wojciechowski** (tutor), (4,5).

[MSc64] Rafał Szumny: *"Lokalizacja stacji ruchomej w systemie GSM metodą odległościową w oparciu o pomiar mocy sygnałów stacji bazowych"* (Mobile station location by dis-tancing method using signal measurements in GSM system), Assist. Prof. **J. Jarkowski** (tutor), (5).

[MSc65] Adam Szymaszczyk: *"Symulacja kanału radiowego z wykorzystaniem wektorowego analizatora sygnałów"* (Radio channel simulation using vector signal analyser), Assist. Prof. **J. Kołakowski** (tutor), (5).

[MSc66] Arkadiusz Trojanowski: *"Transmisja cyfrowa w kanale radiowym z zanikami o rozkładzie Rayleigha z wykorzystaniem długo-terminowej predykcji zaników"* (Digital trans-mission in Rayleigh fading radio channel using long-range prediction), Prof. **J. Wojciechowski** (tutor), (5).

[MSc67] Artur Trybuła: *"System do pomiaru somato-sensorycznych potencjałów wywołanych"* (System for measuring somathosensory evoked potentials), Assist. Prof. **J. Marzec** (tutor), (5).

[MSc68] Radosław Ulinowicz: *"Symulacja kompu-terowa modulatorów Δ-Σ stosowana w przetwarzaniu a/c, c/a sygnałów fonicznych oraz implementacja wybranego modulatora Δ-Σ na procesorze sygnałowym"* (Computer simulations of delta-sigma modulators used in A/D and D/A converters in audio applications), Prof. **Z. Kulka** (tutor), (5).

[MSc69] Robert Walaszczyk: *"Analiza cyfrowych systemów transmisji danych pracujących w paśmie mikrofalowym w konfiguracji punkt - wielopunkt"* (Analysis of digital transmission systems for UHF and SHF bands on the point to multipoint solution), Assist. Prof. **J. Jarkowski** (tutor), (5).

[MSc70] Dariusz Wasiak: *"Komputerowy model lampy cezowej o atomowym wzorcu częstotliwości"* (A ceasium beam tube computer model in atomic frequency standard), Assist. Prof. **K. Radecki** (tutor), (5).

[MSc71] Sławomir Węsek: *"System aktywizacji danych z gammakamery współpracujący z komputerami klasy IBM-PC"* (Gamma-camera data acquisition system for IBM-PC computers), Assist. Prof. **R. Szabatin** (tutor), (4).

[MSc72] Grzegorz Wieczorek: *"Analiza sygnału mowy i wyznaczanie częstotliwości tonu krta-niowego przy zastosowaniu metody cepstralnej"* (Analysis of speech signal and pitch extraction with application of cepstral method), Prof. **W. Skarbek** (tutor), (4,5).

[MSc73] Krzysztof Wnuczek: *"Radiofonia cyfrowa w paśmie poniżej 30 MHz"* (Digital broad-casting in the frequency band below 30 MHz), Assist. Prof. **J. Jarkowski** (tutor), (4,5).

[MSc74] Rafał Wołynko: *"Opracowanie, wykonanie i przetestowanie bloku elektroniki do sterowania zwierciadła spektrometru fourierowskiego"* (Implementation, design and testing of the scanner mirror driver for the Fourier spectrometer), Assist. Prof. **K.Derzakowski** (tutor), (5).

[MSc75] Sebastian Wydra: *"Badanie jakości odtwarzania polskiej mowy przez koder AMR przeprowadzone subiektywną metodą ACR"* (Adaptive multi - rate speech codec in respect of speech quality of ACR (Absolute Category Rating) method), Prof. **J. Woj-ciechowski** (tutor), (5).

[MSc76] Grzegorz Wysocki: *"Projekt, symulacja i wykonanie hybrydowego wzmacniacza fonicznego"* (Project, simulation and con-struction of hybrid audio amplifier), Assist. Prof. **A. Leszczyński** (tutor), (5).

[MSc77] Krzysztof Zaborowski: *"Generacja sygnałów ośmiowartościowej modulacji fazy zgodnych z koncepcją interfejsu radiowego EDGE"* (The generation of 8 PSK modulation signals consistent with the EDGE radio interface concept), Assist. Prof. **J. Kołakowski** (tutor), (5).

[MSc78] Michał Zajączkowski: *"Wybrane aspekty planowania radiowego w systemie UMTS-FDD"* (Selected aspects concerning the radio planning UMTS-FDD system), Assist. Prof. **J. Jarkowski** (tutor), (5).

[MSc79] Marcin Ziembicki: *Sprzętowy generator liczb losowych przeznaczony do zastosowań w systemach kryptograficznych"* (Hardware

random number generator designed for cryptographic systems), Assist. Prof. **J. Marzec** (tutor), (5).

[MSc80] Rafał Ziółkowski: *"Generator VCO dużej mocy na pasmo S"* (High-power VCO generator at S band), Assist. Prof. **W. Wojtasiak** (tutor), (5).

5.4. B.Sc. Degrees

[BSc1] Oktawian Bis: *"Projekt i realizacja toru nadawczego z modulacją FSK na pasmo UHF/VHF"* (The design project and realization of a radio transmitter with FSK modulation on UHF/VHF band), Assist. Prof. **W. Kazubski** (tutor), (4).

[BSc2] Przemysław Buczyński: *"System sterowania usługami multimedialnej platformy domowej przy użyciu PCA"* (System for steering of multimedia home platform services by means of PCA), Prof. **W. Skarbek** (tutor), (5).

[BSc3] Dawid Bujalski: *"Generator prądowy do celów rehabilitacyjnych"* (Current signals generator for medical rehabilitation), Assist. Prof. **K. Zaremba** (tutor), (5).

[BSc4] Jacek Chłopik: *"Parametrised description of waveguide in UDO programming language"*, Assist. Prof. **A. Więckowski** (tutor), (4). **English-medium-studies.**

[BSc5] Piotr Chodkiewicz: *"Analiza czasowa HR EKG"* (HR ECG time analysis), Assist. Prof. **B. Konarzewski** (tutor), (4,5).

[BSc6] Marcin Cybulski: *"Zastosowanie folii dozymetrycznych w brachyterapii wewnątrznaczyniowej"* (Radiochromic films for intravascular brahytherapy), Assist. Prof. **W. Scharf** (tutor), (5).

[BSc7] Andrzej Gaładyk: *"Metoda alternansowa do analizy niestabilności elektrycznej serca"* (Alternans method to analysis heart's electrical unstability), Asist. Prof. **E. Piątkowska-Janko** (tutor), (4).

[BSc8] Adam Gałązka: *"System do wykrywania załamka R i T w przebiegu EKG"* (R and T wave detection system in ECG signal), Prof. **A. Piątkowski** (tutor), (4,5).

[BSc9] Jerzy Guterman: *"Opracowanie oprogramowania wspomagającego generację sygnałów stacji bazowej systemu UMTS z wykorzystaniem procesora sygnałowego TMS 320c 6711"* (Development of the software supporting generation of UMTS base station signal with the use of TMS 320c 6711 signal processor), Assist. Prof. **J. Kołakowski** (tutor), (5).

[BSc10] Michał Halicki: *"Weryfikacja możliwości zastosowania anten rezonatorowych w szyku antenowym o formowanej charakterystyce promieniowania"* (Verification of application ability of resonator antennae in aerial order with form of shape radiation-field patterns), Assist. Prof. **J. Jarkowski** (tutor), (4).

[BSc11] Przemysław Jackiewicz: *"Intelligent file-open change-dir object for electromagnetic simulation software"*, Assist. Prof. **M. Sypniewski** (tutor), (4,5). **English-medium-studies.**

[BSc12] Krzysztof Kaczan: *"Projekt, wykonanie i badanie zespołu głośnikowego klasy hi-fi"* (Project, practical realisation and analysis of 3-way column speaker), Assist. Prof. **J. Narkiewicz-Jodko** (tutor), (5).

[BSc13] Przemysław Kalinowski: *"Rozproszony system pomiarowy z wykorzystaniem systemu Linux i środowiska programowego Kylix"* (Distributed measuring system based on Linux operating system and Kylix programme environment), Assist. Prof. **W. Winiecki** (tutor), (4,5).

[BSc14] Robert Kietliński: *"Cyfrowy dekoder sygnału wizyjnego"* (Digital video decoder), Assist. Prof. **J. Kondarewicz** (tutor), (5).

[BSc15] Monika Kling: *"Oprzyrządowanie stanowiska do badań właściwości propagacyjnych anten w urządzeniach łączności radiowej"* (Medical home care system. Blood pressure meter with USB interface), Assist. Prof. **T. Buczkowski** (tutor), (4).

[BSc16] Michał Klugiewicz: *"Secure instant messenger for small business users"*, Assist. Prof. **K. Ignasiak** (tutor), (5), **English-medium-studies.**

[BSc17] Robert Komorowski: *"System bezprzewodowej wymiany informacji między urządzeniami PDA a bazą kliniki medycznej"* (System for wireless information exchange between PDA devices and medical clinic base), Assist. Prof. **M. Kazubek** (tutor), (5).

[BSc18] Adam Kondrat: *"Projekt serwera aplikacji dla medycznej bazy danych w środowisku Microsoft NET"* (Project of application server for medical database using Microsoft NET), Assist. Prof. **M. Kazubek** (tutor), (5).

[BSc19] Maciej Kosiński: *"Wzmacniacz quasi-stałoprądowy"* (Quasi-direct current amplifier), Assist. Prof. **J. Marzec** (tutor), (5).

[BSc20] Marcin Kowalik: *"Projekt aplikacji e-commerce na platformie WAP"* (Project of Internet application using WAP platform), Assist. Prof. **K. Ignasiak** (tutor), (4,5).

[BSc21] Agnieszka Krasowska: *"Projekt akceleratorowego ośrodka do sterylizacji sprzętu medycznego"* (Project of accelerator's center for sterilization medical devices), Assist. Prof. **W. Scharf** (tutor), (4).

[BSc22] Tadeusz Kubacki: *"Oprogramowanie wspomagające kodowanie i dekodowanie mowy w systemie GSM"* (Software supporting coding and decoding speech in GSM system), Assist. Prof. **J. Kołakowski** (tutor), (5).

[BSc23] Dariusz Kuran: *"Interfejs USB z portami szeregowymi RS232C i RS485"* (USB interface with RS232C and RS485

interfaces), Assist. **T. Jamrógiewicz** (tutor), (5).

[BSc24] Piotr Kwas: *"Program do automatycznej analizy widm spektrometrycznych uzyskiwanych w rentgenowskiej analizie fluorescencyjnej z dyspersją energii"* (The computer programme for automatic spectrometric estimation of elemental composition based on spectra of EDXRF analysis), Assist. Prof. **K. Zaremba** (tutor), (4,5).

[BSc25] Michał Kuciej*: "Samowzbudna dwutaktowa przetwornica napięcia stałego"* (Dc/dc converter; ringing coil, ringing choke type), Assist. Prof. **M. Mikołajewski** (tutor), (4,5).

[BSc26] Lidia Leszczyńska: *"Poprawa percepcji zmian patologicznych w obrazach mammograficznych"* (Perception improvement of pathological changes in mammographic images), Assist. Prof. **A. Przelaskowski** (tutor), (5).

[BSc27] Mariusz Leszczyński: *"Indeksacja zawartości dokumentów DjVu"* (DjVu documents indexation), Prof. **W. Skarbek** (tutor), (5).

[BSc28] Artur Mierzejewski: *"Akwizycja danych EKG z wykorzystaniem różnych protokołów sieciowych"* (ECG data acquisition using various network protocols), Assist. Prof. **E. Piątkowska-Janko** (tutor), (5).

[BSc29] Cezary Mróz: *"Trójwymiarowa wizualizacja obrazów ultrasonograficznych"* (Three dimensional visualization of ultrasound images), Assist. Prof. **M. Kazubek** (tutor), (5).

[BSc30] Roman Niewczas: *"Dobór ochronników słuchu pod względem zrozumiałości mowy"* (Hearing protectors selection based on speech intelligibility), Assist. Prof. **E. Kotarbińska** (tutor), (5).

[BSc31] Przemysław Niżyński: *"Cyfrowy koder sygnału wizyjnego"* (Digital coder for visual signal), Assist. Prof. **J. Kondarewicz** (tutor), (5).

[BSc32] Paweł Nysiak: *"Układ zbierania danych dla potrzeb wysokorozdzielczej elektrokardiografii"* (Data collection system for purpose of high-resolution electrocardiography), Prof. **A. Piątkowski** (tutor), (5).

[BSc33] Jarosław Olechno: *"Projekt, symulacja, wykonanie i badanie zestawu głośnikowego w obudowie typu bas refleks"* (Project, simulation, elaboration and design of loudspeaker enclosure with bass reflex), Assist. Prof. **J. Narkiewicz-Jodko** (tutor), (5).

[BSc34] Marek Parka: *"Strumieniowa transmisja wideo w standardzie Motion JPEG (M-JPEG)"* (Streaming video transmission in Motion JPEG (M-JPEG), Prof. **W. Skarbek** (tutor), (5).

[BSc35] Paweł Pogorzelski: *"Kryptograficzne metody zabezpieczania poufności danych na platformie JAVA."* (Cryptographic methods in securing data confidentiality on the JAVA platform), Assist. Prof. **M. Kazubek** (tutor), (5).

[BSc36] Damian Przetacki: *"Miernik ciśnienia krwi z interfejsem USB"* (Blood pressure meter with USB interface), Assist. **T. Jamrógiewicz** (tutor), (5).

[BSc37] Dominik Rives: *"Standard kompresji obrazów JPEG2000 z uwzględnieniem zastosowań w medycynie"* (The JPEG2000 image compression standard with regard to medical applications), Assist. Prof. **A. Przelaskowski** (tutor), (5).

[BSc38] Marek Rogala: *"Transmisja wideo z wykorzystaniem pakietu JMF (Java Media Framework)"* (Realisation of video transmission software using Java Media Framework), Assist. Prof. **K. Ignasiak** (tutor), (4,5).

[BSc39] Tymon Rubel: *"Oprogramowanie do klasyfikacji schorzeń nowotworowych techniką płytek genowych"* (Software for classification of tumors using gene expression data), Prof. **Z. Pawłowski** (tutor), (5).

[BSc40] Jarosław Sałuda: *"Symulacja Monte Carlo parametrów sensorów radiologicznych"* (Monte Carlo simulations of radiological sensors), Prof. **Z. Pawłowski** (tutor), (3,5).

[BSc41] Wojciech Szostak: *"System domowej opieki medycznej. Miernik ciśnienia krwi z interfejsem USB"* (System of home medical care. Blood pressure meter with USB interface), Assist. Prof. **P. Bogorodzki** (tutor), (5).

[BSc42] Piotr Tracz: *"Wirtualny system radiomonitoringu"* (Virtual radiomonitoring system), Assist. **R. Łukaszewski** (tutor), (4).

[BSc43] Przemysław Trojańczyk: *"Fuzja obrazów tomograficznych CT-SPECT, MRI-PET"* (Fusion of tomographic images CT-SPECT, MRI-PET), Assist. Prof. **P. Brzeski** (tutor), (5).

[BSc44] Marek Tyszków: *"Koder arytmetyczny dla różnych strumieni danych"* (Artimetic coder for various kinds of data streams), Assist. Prof. **A. Przelaskowski** (tutor), (3).

[BSc45] Mariusz Wachowski: *"Opracowanie układu wspomagającego akwizycję i generację sygnałów z wykorzystaniem procesora sygnałowego TMS320C6xxx"* (Development of the system supporting acquisition and generation of the signals with the use of the TMS320C6xxx), Assist. Prof. **J. Kołakowski** (tutor), (5).

[BSc46] Tomasz Walesiak: *"Transmisja obrazów tomograficznych z systemu Siemens Somatom DR oraz konwersja do formatu PCTOMO"* (Tomographic images transmission from Siemens Somatom system and conversion to PCTOMO format), Assist. Prof. **W. Smolik** (tutor), (4,5).

[BSc47] Marcin Walichnowski: *"Aparat EKG o pojemnościowym sprzężeniu z ciałem*

pacjenta" (An ECG device with AC coupling with patient body), Assist. Prof. **J. Marzec** (tutor), (4).

[BSc48] Maciej Węgrzynek: *"Detekcja scen wideo w strumieniu MPEG-1"* (Detection of video scene in MPEG-1 stream), Prof. **W. Skarbek** (tutor), (5).

[BSc49] Krzysztof Wójcik: *"Półmostkowa przetwornica laboratoryjna PWM o mocy 10W"* (PWM half-bridge converter with output power 10W), Assist. Prof. **M. Mikołajewski** (tutor), (4).

[BSc50] Andrzej Zaorski: *"Wykrywanie i uśrednianie załamków R z sygnałów EKG w czasie rzeczywistym"* (Detecting and averaging R wave from ECG signals in real time), Assist. Prof. **P. Bogorodzki** (tutor), (4,5).

[BSc51] Marcin Zawadzki: *Sieciowy system pomiarowy z autoryzowanym dostępem z wykorzystaniem kart inteligentnych"* (Measuring network system with authorized access using inteligent cards), Assist. **R. Łukaszewski** (tutor), (4,5).

[BSc52] Marcin Ziółkowski: *"Tranzystorowy wzmacniacz rezonansowy klasy E o częstotliwości pracy 90 MHz"* (Transistor resonance amplifier class E with work frequency 90 MHz), Assist. Prof. **M. Mikołajewski** (tutor), (4,5).

[BSc53] Damian Zozula / Grzegorz Gołębiecki: *"Video rental service as an example of dynamic, database - driven web solution"*, Assist. Prof. **K. Ignasiak** (tutor), (4). **English-medium-studies.**

[BSc54] Erwin Szuta: *"Program do analizy widmowej sygnałów biologicznych w środowisku MATLAB"* (Programme for spectral analysis of biological signals in MATLAB environment), Assist. Prof. **B. Konarzewski** (tutor), (5).

5.4.a. Engineering Evening Studies on Radiocommunications - B.Sc. Degrees

[BSc54] Paweł Arczewski: *"Zastosowanie technologii xDSL w cyfrowych łączach abonenckich"* (Application of xDSL - Digital Subscriber Line - technology in subscribers' digital links), Assist. **A. Kalinowski** (tutor), (3,5).

[BSc55] Wiesława Barczuk: *"Analiza jakości pracy systemu radiowego dostępu abonenckiego Alcatel 9800"* (Radio local loop Alcatel 9800 system - analysis of work's quality), Assist. Prof. **T. Kosiło** (tutor), (4).

[BSc56] Piotr Biernacki / Arkadiusz Przybyłek: *"Dostęp pierwotny PRA - ISDN w centralach EWSD - opis i pomiary"* (Primary access PRA - ISDN in EWSD telephone centers - descritpion and measurements), Assist. **A. Kalinowski** (tutor), (5 / 4).

[BSc57] Andrzej Bogdanow: *"Projekt i wykonanie stanowiska laboratoryjnego do badania modemów telefonicznych"* (Project and construction of laboratory stand for telephone modems investigations), Assist. **H. Chaciński** (tutor), (3,5).

[BSc58] Jarosław Buckiewicz: *"System kontrolno-pomiarowy dla telewizji kablowej"*, (The control - measurement system to apply in the cable TV network), Assist. Prof. **K. Czerwiński** (tutor), (4).

[BSc59] Cezary Cieśliński: *"Bezprzewodowy modem radiowy"* (Wireless radio modem), Assist. Prof. **K. Czerwiński** (tutor), (4).

[BSc60] Paweł Dryja: *"Rezonansowy wzmacniacz klasy C do laboratorium studenckiego"* (Resonance high-frequency class C tuned power amplifier), Assist. Prof. **J. Modzelewski** (tutor), (5).

[BSc61] Jacek Fonrobert: *"Automatyzacja monitorowania widma elektromagnetycznego z zastosowaniem odbiornika pomiarowego"*, (Monitoring of automation electromagnetic spectrum using measuring receiver), Assist. Prof. **J. Kołakowski** (tutor), (5).

[BSc62] Przemysław Frączkiewicz: *"Wysokostabilny wzorzec czasu i częstotliwości"* (A highly stable pattern of time and frequency), Assist. Prof. **W. Kazubski** (tutor), (4,5).

[BSc63] Jan Kajda: *"Ocena zrozumiałości mowy telefonicznej metodą wyrazistości logatonowej"* (Assessment of telephone speech quality according to the logaton intelligibility method), Assist. Prof. **S. Kula** (tutor), (4,5).

[BSc64] Grzegorz Kotarba: *"Projekt zastosowania szerokopasmowego systemu przesyłania danych ADSL - Neostrada"* (Application project of sending data system's ADSL - Neostrada), Assist. **A. Kalinowski** (tutor), (4).

[BSc65] Roman Kraska / Wiesław Malec: *"System radiowego dostępu Alcatel 9800 - działanie i analiza pracy systemu w warunkach infrastruktury wiejskiej i podmiejskiej"* (Radio local loop Alcatel 9800 system - operates in rural and suburban infrastuctural areas), Assist. Prof. **J. Jarkowski** (tutor), (5).

[BSc66] Jacek Legawiec: *"Usługa Centrex - Wirtualna Centralka Abonencka jako projekt zastosowania nowoczesnych systemów telekomunikacyjnych w dużych firmach z wykorzystaniem systemu HDSL"* (Centrex service - virtual subscriber's exchange - as an application project of a modern telecommunication systems in large firms with the usage of HDSL systems), Assist. **A. Kalinowski** (tutor), (5).

[BSc67] Marek Małota: *"Ewidencja systemu sieci światłowodowej"* (Recording of optical waveguide network system), Prof. **K. Holejko** (tutor), (5).

[BSc68] Andrzej Mazurczyk: *"Baza danych dokumentacji technicznej sieci telekomunikacyjnych zgromadzonej w rysunkach AutoCad"* (The database of the technical documentation of the telephone networks gathered in the AutoCad programme), Assist. Prof. **W. Smolik** (tutor), (4,5).

[BSc69] Wojciech Pachocki: *"Projekt koncepcyjny systemu dostępu mobilnego o powiększonej przepływności bitowej"* (Conceptional project of mobile access system with enlarged bit rate), Assist. Prof. **J. Jarkowski** (tutor), (5).

[BSc70] Jan Salachna: *"Wzmacniacz mocy klasy E dla potrzeb laboratorium studenckiego"* (Class E tuned power amplifier for student's laboratory), Assist. Prof. **J. Modzelewski** (tutor), (4,5).

[BSc71] Jarosław Szacoń: *"Monitorowanie częstotliwości nośnych nadajników radiofonicznych UKF-FM i nadajników telewizyjnych"* (Monitoring of the carrier frequencies of VHF-FM broadcast transmitters and television transmitters), Assist Prof. **J. Modzelewski** (tutor), (4,5).

[BSc72] Marcin Szczepańczyk: *"Generator sygnałowy z bezpośrednią synteza częstotliwości"* (Signal generator with direct frequency synthesis), Assist. Prof. **K. Czerwiński** (tutor), (3,5).

[BSc73] Zbigniew Szczepańczyk: *"Analiza wybranych systemów radiowego dostępu abonenckiego pod kątem ich charakterystycznych parametrów i projektowania inwestycyjnego"* (Analysis of the chosen radio subscription access systems taking into regard their characteristics parameters and investment designing), Assist. Prof. **J. Jarkowski** (tutor), (3,5).

[BSc74] Paweł Truszewski: *"Własności anten typu Yagi - Uda"* (The features of transmitting aerials of Yagi-Uda type), Assist. Prof. **J. Jarkowski** (tutor), (3).

[BSc75] Krzysztof Walczuk: *"System zdalnego monitorowania pacjenta z użyciem protokołu TCP/IP"* (System for remote monitoring of patient using TCP/IP protocol), Assist. **T. Olszewski** (tutor), (5).

[BSc76] Anna Wilk: *"Przegląd systemów radiowego dostępu abonenckiego na terenach słabo zurbanizowanych"* (The radio access subscriber systems' review on the weakly urban development lands), Assist. Prof. **T. Kosiło** (tutor), (4,5).

[BSc77] Paweł Witczak: *"Projekt szerokopasmowej sieci światłowodowej"* (Project of wideband fibre network), Prof. **K. Holejko** (tutor), (5).

[BSc78] Andrzej Witt / Paweł Oracz: *"Elementy projektowania satelitarnych systemów z wielodostępem TDMA i CDMA"* (Elements of satellite systems design with multi-access TDMA and CDMA), Assist. **K. Włostowski** (tutor), (3).

[BSc79] Mirosław Wnuczewski: *"Modem do transmisji drogą radiową w pasmie ISM"* (ISM radio modem), Assist. Prof. **T. Kosiło** (tutor), (5).

6. PUBLICATIONS

6.1. Scientific and technical books, chapters in books

[Pub1] Z. Pawłowski: „Rentgenowska analiza fluoroscencyjna w badaniach składu tkanek biologicznych", (X-ray Fluorescent Analysis in Biological Tissue Contents Examinations) in: *Biocybernetyka i Inżynieria Biomedyczna 2000*, Vol. 9, *Fizyka Medyczna* (Bio-cybernetics and Biomedical Engeneering), *Oficyna Wydawnicza PW* (Academic Publishing House), Warsaw (2002), (ISBN 83-87674-37-0), pp. 97-124.

[Pub2] S. Rosłoniec: "Wybrane metody numeryczne z przykładami zastosowań w zadaniach inżynierskich", (Selected Numerical Methods with Applications in Engineering Tasks), *Oficyna Wydawnicza Politechniki Warszawskiej* (Academic Publishing House), Warsaw (2002), ISBN 83-7207-342-2, 208 pp.

6.2. Scientific and technical papers in journals

[Pub3] P. Bilski, W. Winiecki: "Virtual Spectrum Analyser Based on Data Acquisition Card", *IEEE Transactions on Instrumentation and Measurement*, Vol. 51, No. 1, (Feb. 2002), pp. 82-87.

[Pub4] J. Cichocki: "Pomiary urządzeń radiowych cyfrowych systemów telefonii komórkowej - cz.I" (Measurements of Radio Devices in Cellular Digital Systems), *Pomiary w Telekomunikacji*, No. 20 (2002), pp. 62-89.

[Pub5] T. Daniluk: "Kondensatory ceramiczne w filtrach wejściowych przetwornic DC-DC" (Ceramic Capacitors in Input Filters of DC-DC Convertes), *Elektronik*, 12/2002, pp. 46-49.

[Pub6] K. Derzakowski, A. Abramowicz, J. Krupka: "Whispering Gallery Resonator Method for Permittivity Measurements", *Journal on Tele-communications and Information Techno-logy*, No. 1/2002, pp. 43-47.

[Pub7] S. L. Hahn, K. M. Snopek: "Double-Dimansional Distributions: Another Approach to "Quartic" Distributions", *IEEE Transactions on Signal Processing*, Vol. 50, No. 12 (2002), pp. 2987-2988.

[Pub8] T. Knyziak, W. Winiecki: "Nowa koncepcja rozproszonego przyrządu wirtualnego wykorzystującego telefon komórkowy z wbudowaną maszyną wirtualną platformy Java 2 Micro Edition" (New Concept of Distributed Virtual Instrument Using Mobile Phone with Built-in Java 2 Micro Edition Virtual Platform), *Pomiary, Automatyka, Kontrola*, No. 7/8, (2002), pp. 53-56.

[Pub9] P. Kopyt, M. Celuch-Marcysiak: "FDTD Modeling and Experimental Verification of Electromagnetic Power Dissipated in Domestic Microwave Ovens", *Journal of Telecommunications and Information Technology*.

[Pub10] Z. Kulka: "Wielokanałowe odtwarzacze DVD-Audio i SACD" (DVD-Audio and SACD Multichannel Players), *Audio Video*, No. 4/02, pp. 56-57.

[Pub11] Z. Kulka: "Mocne i słabe strony nowych formatów dźwiękowych" (Strong and Weak Sides of New Sound Formats), *Audio Video*, No. 6/02, pp. 56-59.

[Pub12] Z. Kulka: "Wzorcowy odtwarzacz CD P-70/D-70 firmy TEAC" (TEAC P-70/D-70 CD Perfect Player), *Audio Video*, No. 11/02, pp.62-65.

[Pub13] A. Leszczyński: "Dynamika systemów fonicznych" (Dynamics of Audio Systems), *Audio Video*, No. 8/02, pp. 50-51.

[Pub14] J. Marzec, K. Zaremba, Z. Pawłowski, B. Konarzewski: "Transparency of the Straw Tube Cathode for the Electromagnetic Field", *IEEE Transactions on Nuclear Science*, Vol. 49, No. 2 (2002) pp. 548-552.

[Pub15] J. Marzec, K. Zaremba, Z. Pawłowski, B. Konarzewski, G. Domański: "Elektronika od-czytu komór słomkowych w eksperymencie COMPASS" (Read-out Electronics of the Straw Chamber in COMPASS Experiment), *Kwartalnik Elektroniki i Telekomunikacji*, Vol. 8, z. 2 (2002), pp. 421-433.

[Pub16] R. Z. Morawski: "Are Measurement-oriented Courses Getting too Difficult for Polish Students?", *Measurement-Journal of IMEKO*, Vol. 32, No. 1, (Jul. 2002), p. 31-38.

[Pub17] C. Niedziński, A. Miękina, R. Z. Morawski: "Algorithms for Estimation of Concentrations in Spectrophotometric Analysis of Multi-component Substances", *IEEE Transactions on Instrumentation and Measurement*, Vol. 51, No. 5, (Oct. 2002).

[Pub18] A. Płatonow, W. Winiecki: "Statistical Synthe-sis and Optimal Decomposition in Intelligent Monitoring Systems Design", *Computer Standards & Interfaces 24*, Elsevier, (2002), pp. 101-110.

[Pub19] A. Przelaskowski: „Falkowe metody kompresji danych obrazowych", (Wavelet-based Image Data Compression)*, Prace Naukowe Politechniki Warszawskiej: "Elektronika"*, z. 138, (2002), ISSN 0137-2343, 228 pp.

[Pub20] G. Radzikowski: "Konwergencja telekomu-nikacji i informatyki" (Convergence of Tele-communications and Informatics), *Infotel 2/2002*, pp. 40-41.

[Pub21] G. Radzikowski: "Architektura zabezpieczeń w sieciach heterogenicznych" (Architecture of Protections in Heterogonous Networks), *IT Security Magazine*, No. 1/2 (2002), pp. 42-50.

[Pub22] P. Sprzęczak, R. Z. Morawski: "Cauchy Filters versus Neural Networks when Applied for Reconstruction of Absorption Spectra", *IEEE Transactions on Instrumentation and Measurement*, Vol. 5, No. 4, (Aug. 2002), pp. 815-818.

[Pub23] M. Szczepaniak, J. Wojciechowski: "Mobilni włamywacze. Nadużycia w komórkowych sieciach telefonicznych" (Frauds in Mobile Telephone Networks), *Infotel*, 12/2002, pp. 4-17.

[Pub24] W. Winiecki, M. Karkowski: "A New Java-based Software Environment for Measuring Systems Designing", *IEEE Transactions on Instrumentation and Measurement*, Vol. 51, No. 6, (Dec. 2002).

[Pub25] W. Wojtasiak: "Tranzystory mikrofalowe - technologia, parametry i zastosowania" (Microwave Transistors - Technique, Parameters and Applications), *Elektronika* (XLIII), No. 7-8, (2002), ISSN 0033-2089, pp. 32-34.

[Pub26] J. Woźnicki, R. Z. Morawski: "Public and Private Higher Education Institutions: Joint or Separate Evaluation and Ranking - the Polish Perspective", *Higher Education Europe*, No. 4, (2002).

[Pub27] Y. Yashchyshyn, J. Modelski: "Synteza paskowych szyków antenowych na podłożu ferroelektrycznym" (Synthesis of Microstrip Antenna Arrays on Ferroelectric Substrate), *Kwartalnik Elektroniki i Telekomunikacji*, 48, z. 1, (2002), pp. 67-80.

[Pub28] Y. Yashchyshyn: "Modelowanie anteny paskowej na podłożu organicznym i nieorganicznym. Modelowanie i technologie informacyjne" (Modelling of Microstrip Antenna on Finite and Infinite Substrate. Modelling and Information Technologies), (translation from Ukrainian language), *Prace Naukowe Instytutu Problemów Modelowania*, Ukraińska Akademia Nauk (Institute of Modelling Problems, Ukrainian Academy of Sciences), Kiev, Ukraine (2002), pp. 120-127.

[Pub29] K. Zaremba: „Wybrane radiacyjne metody badania składu tkanek i płynów ustrojowych" (Chosen Radiational Methods of Tissue and Body Fluids Composition Measurements), *Prace Naukowe Politechniki Warszawskiej „Elektronika"*, z. 137 (2002), (ISSN 0137-2343), 166 pp.

6.3. Scientific and technical papers in conference proceedings

[Pub30] A. Abramowicz, J. Krupka, K. Derzakowski: „Precise Measurement of the Complex Permittivity at Microwave Frequencies", *Mat. X Krajowego Sympozjum Nauk Radiowych: URSI 2002* (Proc. X[th] Union of Radio Science Symposium: URSI 2002 (Poznań, Poland, Mar. 14-15, 2002), pp. 345-353.

[Pub31] A. Abramowicz, K. Derzakowski, J. Krupka: "Accuracy of Dielectric Permittivity Measurements Using Whispering Gallery Mode Open Resonators", *Proc. 2002 Asia-Pacific Microwave Conference: APMC 2002* (Kyoto, Japan, Nov. 19-22, 2002), on CD-ROM.

[Pub32] S. Barański, W. Skarbek: ″Rozpoznawanie numerów tablic rejestracyjnych w obrazie" (Numbers Recognition in Plate Images), *Mat. IV Sympozjum Naukowego: Techniki Przetwarzania Obrazu* (Proc. IVth Scientific Symposium on Image Processing Techniques), (Serock, Poland, Oct. 21-23, 2002).

[Pub33] R. Bielawski, M. Tajchert: "Korektor brzmienia dźwięku zrealizowany z wykorzystaniem cyfrowego filtru adaptacyjnego" (Application of Digital Aadaptive Filter for Sound Equalizer), *Mat. IX Sympozjum "Nowości w Technice Audio i Wideo"* (Proc. IXth Symposium: "New Trends in Audio and Video Technology"), (Warsaw, Poland, Sept. 27-28, 2002), pp. 15-28.

[Pub34] P. Bobiński: "Optymalizacja w koderze standardu JVT" (Optimization in JVT Standard Coder), *Mat. III Seminarium - Radiokomunikacja i Techniki Multimedialne* (Proc. IIIrd Seminar - Radiocommunications and Multimedia Technologies), (Warsaw, Poland, Dec. 4, 2002), (ISBN 83-916802-9-0), pp. 117-122.

[Pub35] P. Bobiński, W. Skarbek: ″Kodowanie binarne w rodzinie standardów H.26X" (Binary Encoding in H.26X Family Standards), *Mat. III Krajowej Konferencji: Multimedialne i Sieciowe Systemy Informacyjne*, (Proc. 3rd National Conference: Multimedia and Network Information Systems), (Wrocław, Poland, Sept. 19-20, 2002), pp. 249-258.

[Pub36] P. Bobiński, W. Skarbek: ″Optymalizacja kodera JVT" (JVT Encoder Optimisation), *Mat. IV Sympozjum Naukowego: Techniki Przetwarzania Obrazu* (Proc. IVth Scientific Symposium on Image Processing Techniques), (Serock, Poland, Oct. 21-23, 2002).

[Pub37] P. Boniński, A. Przelaskowski, M. Kazubek, A. Wróblewska: „Zastosowanie kwantyzacji wektorowej LVQ w procesie klasyfikacji mikrozwapnień w cyfrowej mammografii" (LVQ-based Classification of Microcalcifications in Digital Mammography), *Mat. IV Sympozjum Naukowego: Techniki Przetwarzania Obrazu* (Proc. IVth Scientific Sym-

posium on Image Processing Techniques) (Serock, Poland, Oct. 21-23, 2002).

[Pub38] P. Brzeski, J. Mirkowski, T. Olszewski, A. Pląskowski, W. Smolik, R. Szabatin: "Tomograf pojemnościowy do obrazowania technologicznych procesów dynamicznych" (Capacitance Tomograph for Dynamic Industrial Process Imaging), *Mat. IV Sympozjum Naukowego: Techniki Przetwarzania Obrazu* (Proc. IVth Scientific Symposium on Image Processing Techniques) (Serock, Poland, Oct. 21-23, 2002).

[Pub39] A. Buchowicz: "Standard telewizji interaktywnej DVB-MHP" (DVB-MHP Interactive Television Standard), *Mat. IX Sympozjum "Nowości w Technice Audio Wideo"* (Proc. IXth Symposium: "New Trends in Audio and Video Technology"), (Warsaw, Poland, Sept. 27-28, 2002), pp. 231-237.

[Pub40] A. Buchowicz, K. Ignasiak: "Realizacja dekodera JVT na platformie Equator" (Realisation of JVT Decoder Based on Equator Technology), *Mat. IV Sympozjum Naukowego: Techniki Przetwarzania Obrazu* (Proc. IVth Scientific Symposium on Image Processing Techniques), (Serock k/Warszawy, Nov. 21-23, 2002).

[Pub41] M. Celuch-Marcysiak: "Demonstration and Suppression of Numerical Divergence Errors in FDTD Analysis of Practical Microwave Problems", *Proc. IEEE MTT-S International Microwave Symposium Digest* (Seattle, Washington, USA, May 31 - Jun. 9, 2002), Vol. 2, pp. 751-754.

[Pub42] M. Celuch-Marcysiak, V. V. Yakovlev: "Computational Verification of the Concept of Microwave Drilling Towards Increasing its Safety", *Proc.14th International Conference on Microwaves, Radar and Wireless Communications: MIKON 2002* (Gdańsk, Poland, May 20-22, 2002), Vol. 2, pp. 369-402.

[Pub43] M. Celuch-Marcysiak, J. Rudnicki, M. Sypniewski: "Multithread FDTD Modelling of Segmentated Microwave Heating Systems", *Proc. 3rd World Congresss on Microwave & Radio Frequency Applications: Bridging Science, Technology and Applications* (Sydney, Australia, Sept. 22-26, 2002), Section M4A, No. M4A_11, 2 pp.

[Pub44] K. Derzakowski, A. Abramowicz, J. Krupka: „Accuracy of the Permittivity Measurements Using Open Dielectric Resonators", *Mat. X Krajowego Sympozjum Nauk Radiowych: URSI 2002* (Proc. X[th] Union of Radio Science Symposium: URSI 2002), (Poznań, Poland, Mar. 14-15, 2002), pp. 341-344.

[Pub45] G. Domański, B. Konarzewski, J. Marzec, Z. Pawłowski, K. Zaremba: „Optymalizacja luminescencyjnych sensorów obrazu do medycznych systemów radiograficznych" (Optimization of Luminescent Image Sensors for Medical Radiographic Systems), *Mat. IV Sympozjum Naukowego: Techniki Przetwarzania Obrazu*, (Proc. IVth Scientific Sym-

posium on Image Processing), (Serock, Poland, Oct. 21-23, 2002).

[Pub46] A. Filipkowski, K. Zaremba: "Internationalization of Engineering Education in European Pre-accession Countries: the Polish Case", *Proc. 2002 ASEE Annual Conference* (Montreal, Canada, Jun. 15-21, 2002), CD-ROM #0409.

[Pub47] G. Galiński: "Kompresja deskryptora trajektorii ruchu" (Compression of movement trajectory descriptor), *Mat. Krajowej Konferencji Radiokomunikacji, Radiofonii i Telewizji* (Proc. National Conference on Radiocommunications, Broadcasting and Television), (Gdańsk, Poland, Jun. 12-14, 2002), pp. 145-148.

[Pub48] G. Galiński: "Technika centrodidów i technika dyspersji w wyszukiwaniu deskryptorów trajektorii ruchu" (Centroides and Dispersion Technology for Searching of Movement Trajectory Descriptors), *Mat. IX Sympozjum "Nowości w Technice Audio Wideo"* (Proc. IXth Symposium: "New Trends in Audio and Video Technology"), (Warsaw, Poland, Sept. 27-28, 2002), pp. 243-247.

[Pub49] G. Galiński: "Efektywne wyszukiwanie deskryptorów trajektorii ruchu" (Effective Searching of Movement Trajectory Descriptor), *Mat. III Krajowej Konferencji: Multimedialne i Sieciowe Systemy Informacyjne* (Proc. IIIrd National Conference: Multimedia and Networks Information Systems), (Wrocław, Poland Sept. 19-20, 2002), pp. 105-114.

[Pub50] G. Galiński: "Detekcja i indeksowanie ruchu w sekwencji obrazów" (Detection and Indexation of Movement in Image Sequence), *Mat. III Seminarium - Radiokomunikacja i Techniki Multimedialne* (Proc. IIIrd Seminar - Radiocommunications and Multimedia Technologies), (Warsaw, Poland, Dec. 4, 2002), (ISBN 83-916802-9-0), pp. 111-115.

[Pub51] G. Galiński, W. Skarbek: "Zmodyfikowany deskryptor trajektorii ruchu w standardzie MPEG-7" (Modified Movement Trajectory Descriptor in MPEG-7 Standard), *Mat. IV Sympozjum Naukowego: Techniki Przetwarzania Obrazu* (Proc. IVth Scientific Symposium on Image Processing Techniques), (Serock k/Warszawy, Nov. 21-23, 2002).

[Pub52] B. L Givot, J. Krupka, K. Derzakowski: "Split-post Dielectric Resonator for Complex Permittivity Measurements at 20-25 GHz", *Proc.14th International Conference on Microwaves, Radar and Wireless Communications: MIKON 2002* (Gdańsk, Poland, May 20-22, 2002), Vol. 2, pp. 401-403.

[Pub53] H. Goszczyńska, P. Bogorodzki, T. Wolak, R. Kurjata, M. Orzechowski, L. Kowalczyk: "Validation of the Coronary Blood Flow Measurement from X-Ray Images Performed on the Artery Model" *Proc. International Federation for Medical & Biological Engineering,*

12th Nordic Baltic Conference on Bio-medical Engineering and Medical Physics (Reykyavik Iceland, Jun. 18-22, 2002), pp. 120-121.

[Pub54] H. Goszczyńska, P. Bogorodzki, T. Wolak, R. Kurjata, M. Orzechowski: "Validation of the Absolute Coronary Blood Flow Measurement from Coronarographic Images Performed on the Artery Model", *Proc. East-West-Vision: International Workshop & Project Festival Computer Vision, Computer Graphics, New Media*, (Graz, Austria, Sept. 12 - 13, 2002), pp. 211-212.

[Pub55] H. Goszczyńska, P. Bogorodzki, T. Wolak, R. Kurjata, M. Orzechowski, L. Kowalczyk: "Preliminary Experimental Validation of the Absolute Coronary Blood Flow Measurement from Coronarographic Images Performed on the Artery Model" *Proc. 12th Portuguese Conference on Pattern Recognition, RecPad 2002* (Aveiro, Portugal, Jun. 27-28, 2002), pp. 1-4.

[Pub56] H. Goszczyńska, P. Bogorodzki, T. Wolak, R. Kurjata, M. Orzechowski: "Coronary Blood Flow Measurement from X-rays Images: Validation Performed on the Artery Model", *Proc. 2nd European Medical & Biological Engineering Conference*, (Vienna, Austria, Dec. 4-8, 2002, part 2 pp. 896-897.

[Pub57] A. Jakubiak, D. Radomski, W. Smolik, R. Szabatin: "Metody statystyczne rekonstrukcji obrazów w tomografii PET" (Statistical Methods for PET Image Reconstraction), *Mat. IV Sympozjum Naukowego: Techniki Przetwarzania Obrazu*, (Proc. IVth Scientific Symposium on Image Processing), (Serock, Poland, Oct. 21-23, 2002).

[Pub58] D. Janusek: "Optymalizacja aparatury, metod rejestracji i wykrywanie zmienności załamka T w elektrokardiogramach" (Optimization of Apparatus, Methods of Recording and Detection based on T-wave Parameters ECG), *Mat. III Seminarium - Radiokomunikacja i Techniki Multimedialne* (Proc. IIIrd Seminar - Radiocommunications and Multimedia Technologies), (Warsaw, Poland, Dec. 4, 2002), (ISBN 83-916802-9-0), pp. 147-152.

[Pub59] P. Kącki: "Procedura koordynacji luster biernych w służbie stałej dla łaczy typu punkt-punkt" (Coordination of Passive Repeaters in Passive Radio Networks), *Mat. Krajowej Konferencji Radiokomunikacji, Radiofonii i Telewizji: KKRRiT 2002* (Proc. National Conference on Radiocommunications, Broadcasting and Television), (Gdańsk, Poland, Jun. 12-14, 2002), pp. 349-352.

[Pub60] P. Kącki: "Współużytkowanie pasma 2,4GHz przez systemy radiowego dostępu abonenckiego oraz urządzenia małej mocy" (Sharing Aspects of Mixed Wireless Access Networks and Short Range Devices in the 2.4 GHz Band), *Mat. Krajowej Konferencji Radiokomunikacji, Radiofonii i Telewizji:*

KKRRiT 2002 (Proc. National Conference on Radiocommunications, Broadcasting and Television), (Gdańsk, Poland, Jun. 12-14, 2002), pp. 345-348.

[Pub61] T. Keller: "Projekt multimedialnego serwera usług" (Project of Multimedia Serviece Server), *Mat. IX Sympozjum "Nowości w Technice Audio Wideo*" (Proc. IXth Symposium: "New Trends in Audio and Video Technology"), (Warsaw, Poland, Sept. 27-28, 2002), pp. 265-274.

[Pub62] T. Keller, A. Buchowicz, W. Skarbek: "Domowa platforma edukacyjna na bazie standardu DVB-MHP" (Educational Home Platform Based on DVB-MHP Standard), *Mat. Krajowej Konferencji Radiokomunikacji, Radiofonii i Telewizji* (Proc. National Conference on Radiocommunications, Broadcasting and Television), (Gdańsk, Poland, Jun. 12-14, 2002), pp. 227-230.

[Pub63] T. Knyziak, W. Winiecki: "Java 2 Micro Edition Mobile Phone in a Distributed Measuring System", *Proc. NATO Regional Conference on Military Communications and Information Systems: RCMCIS 2002* (Zegrze, Poland, Oct. 9-11, 2002), pp. 101-107.

[Pub64] J. Kołakowski, J. Cichocki: "Wykorzystanie transformacji falkowej w badaniach dewiacji nadajników radiofonicznych FM" (Application of Wavelet Transform for Measurements Broadcasting Transmitter Deviation), *Mat. Krajowej Konferencji Radiokomunikacji, Radiofonii i Telewizji* (Proc. National Conference on Radiocommunications, Broadcasting and Television), (Gdańsk, Poland, Jun. 12-14, 2002), pp. 235-238.

[Pub65] P. Kopyt, M. Celuch-Marcysiak: "FDTD Modeling of Electromagnetic Power Dissipated in Rotated Objects", *Proc.14th International Conference on Microwaves, Radar and Wireless Communications: MIKON 2002* (Gdańsk, Poland, May 20-22, 2002), Vol. 2, pp. 365-368.

[Pub66] P. Kopyt, M. Celuch-Marcysiak: "Review of Numerical Methods for Solving Heat Conduction Coupled to Conformal Electromagnetic FDTD Solver", *Proc. European Symposium on Numerical Methods in Electromagnetics: JEE'02* (Tuluse, France, Mar. 6-8, 2002), pp. 140-143.

[Pub67] P. Kopyt, M. Celuch-Marcysiak, W. K. Gwarek: "FDTD Modeling of Electromagnetic Power Dissipation in Rotated Objects", *Proc. 3rd World Congresss on Microwave & Radio Frequency Applications: Bridging Science, Technology and Applications* (Sydney, Australia, Sept. 22-26, 2002), Section T2C No. T2C_4, 2 pp.

[Pub68] M. Kostrzewa: "Metody konwersji sygnałów w formacie PCM na format PWM stosowane w cyfrowych wzmacniaczach fonicznych" (PCM to PWM Signal Conversion Methods in Digital Audio Amplifiers), *Mat. IX Sympozjum "Nowości w Technice Audio i Wideo*"

(Proc. IXth Symposium: "New Trends in Audio and Video Technology"), (Warsaw, Poland, Sept. 27-28, 2002), pp. 77-92.

[Pub69] E. Kotarbińska: "Long term Investigations of Sound Attenuation Changes in Ear-muffs - Preliminary Results", *Proc. International Conference – Forum Acousticum* (Sewilla, Spain, Sept. 15-22, 2002), on CD-ROM.

[Pub70] J. Krupka, K. Derzakowski, A. Abramowicz, J. Baker-Jarvis, R. Ono, R. Geyer: "Surface Impedance of Thin High Temperature Superconcucting Films with a Sapphire Dielectric Resonator", P*roc. 14th International Conference on Microwaves, Radar and Wireless Communications: MIKON 2002* (Gdańsk, Poland, May 20-22, 2002), Vol. 2, pp. 391-393.

[Pub71] J. Krupka, K. Derzakowski, A. Abramowicz, B. Riddle, J. Baker-Jarvis, R. N. Clarke, O. C. Rochard: "Bounds on Permittivity Calculations Using the $TE_{01\delta}$ Dielectric Resonator", P*roc. 14th International Conference on Microwaves, Radar and Wireless Communications: MIKON 2002* (Gdańsk, Poland, May 20-22, 2002), Vol. 2, pp. 394-396.

[Pub72] Z. Kulka, P. Nykiel, R. Ulinowicz: "Badania i optymalizacja jedno- i kilkubitowych ditherowanych modulatorów delta-sigma przeznaczonych do cyfrowych systemów fonicznych" (Investigation and Optimization of One- and Few-bit Dithered Delta-sigma Modulators Used in Digital Audio Systems), *Mat. IX Sympozjum "Nowości w Technice Audio i Wideo"* (IXth Symposium: "New Trends in Audio and Video Technology"), (Warsaw, Poland, Sept. 27-28, 2002), pp. 103-109.

[Pub73] K. Kurek: "Analiza szerokopasmowych właściwości kanału propagacyjnego wewnątrz budynków w systemach łączności bezprzewodowej" (Analysis of Wideband Indoor Propagation Channel Properties in Wireless Communication Systems), *Mat. III Seminarium - Radiokomunikacja i Techniki Multimedialne* (Proc. IIIrd Seminar - Radiocommunications and Multimedia Technologies), (Warsaw, Poland, Dec. 4, 2002), (ISBN 83-916802-9-0), pp. 55-64.

[Pub74] K. Kurek, J. Modelski: "Influence of Antennas on the Wideband Properties of the Indoor Propagation Channel", *Proc. European Microwave Conference, and European Wireless Week* (Milano, Italy, Sept. 23-27, 2002), on CD-ROM.

[Pub75] K. Kurek, Y. Yashchyshyn, K. Stefański: "Quasi-3D Tool to Analyse of the Radio Propagation Channel", P*roc. 14th International Conference on Microwaves, Radar and Wireless Communications: MIKON 2002* (Gdańsk, Poland, May 20-22, 2002), Vol. 3, pp. 865-868.

[Pub76] G. Kustra: "Zastosowanie adaptacyjnych sieci neuronowych w aktywnej redukcji hałasu" (Application of Adaptive Neural Networks in Active Noise Control), *Mat. IX*

Sympozjum "Nowości w Technice Audio i Wideo" (Proc. IXth Symposium: "New Trends in Audio and Video Technology"), (Warsaw, Poland, Sept. 27-28, 2002), pp. 111-122.

[Pub77] G. Kustra: "Algorytmy identyfikacji i adaptacji w jednokanałowych systemach aktywnej redukcji hałasu" (Identification and Adaptation Algorithms in One-channel Systems of Active Noise Control), *Mat. IX Sympozjum "Nowości w Technice Audio i Wideo"* (Proc. IXth Symposium: "New Trends in Audio and Video Technology"), (Warsaw, Poland, Sept. 27-28, 2002), pp. 123-135.

[Pub78] M. Łempkowski, K. Kucharski, W. Skarbek: "Kompresja obrazów twarzy przy użyciu rozmytych modeli LPCA" (Facial Images Compression Using Fuzzy LPCA Models), *Mat. IV Sympozjum Naukowego: Techniki Przetwarzania Obrazu* (Proc. IVth Scientific Symposium on Image Processing Techniques), (Serock, Poland, Oct. 21-23, 2002).

[Pub79] K. Łukaszewicz, K. Radecki: "Zastosowanie mikronadajników w paśmie 433 MHz do wspomagania orientacji osób niewidomych" (Application of 433MHz Microtransmitters for the Blind People Supporting), *X Krajowe Sympozjum Nauk Radiowych: URSI 2002* (X[th] Union of Radio Science Symposium: URSI 2002 (Poznań, Poland, Mar. 14-15, 2002), pp. 288-292.

[Pub80] R. Łukaszewski, W. Winiecki: "New Information Technologies in Measuring Systems Designing", *Proc. Joint IMEKO TC-1 & XXXIV MKM 2002 Conference: Education in Measurements and Instrumentation - Challenges of New Technologies* (Wrocław, Poland, Sept. 8-12, 2002), Vol. I, pp. 121-128.

[Pub81] S. Maszczyk: "Wykorzystanie transformacji falkowej do eliminacji zakłóceń wąskopasmowych w systemach CDMA" (Application of Wavelet Transform for Narrowband Interference Reduction in CDMA Systems), *Mat. III Seminarium - Radiokomunikacja i Techniki Multimedialne (*Proc. IIIrd Seminar - Radiocommunications and Multimedia Technologies), (Warsaw, Poland, Dec. 4, 2002), (ISBN 83-916802-9-0), pp. 9-14.

[Pub82] S. Maszczyk: "Wykorzystanie transformacji falkowej do eliminacji zakłóceń wąskopasmowych w systemach CDMA" (Application of Wavelet Transform for Narrowband Interference Reduction in CDMA Systems), *Mat. Krajowej Konferencji Radiokomunikacji, Radiofonii i Telewizji: KKRRiT 2002* (Proc. National Conference on Radiocommunications, Broadcasting and Television), (Gdańsk, Poland, Jun. 12-14, 2002), pp. 83-86.

[Pub83] S. Maszczyk: "Detection and Reduction of Narrowband Interference from CDMA Signals", *Proc. 16th International Wroclaw Symposium and Exhibition of Electromagnetic Compatibility 2002* (Wrocław, Poland, Jun. 25-128, 2002), pp. 261-264.

[Pub84] R. Michnowski, W. Wojtasiak: "The Thermal Effects in LDMOS Transistor", P*roc. 14th International Conference on Microwaves, Radar and Wireless Communications: MIKON 2002* (Gdańsk, Poland, May 20-22, 2002), Vol. 1, pp. 89-92.

[Pub85] M. Mikołajewski: "Wysokosprawne uklady przetwarzające energie w.cz. z regulatorami ynchronicznymi" (High-Efficiency High-Frequency Converters with Synchronous Regulators), *Mat. I Krajowej Konferencji Elektroniki: KKE 2002* (Ist National Conference on Electronics), (Kołobrzeg-Dźwirzyno, Poland, Jun. 10-12, 2002), pp. 319-324.

[Pub86] M. Mikołowicz: "Koncepcja systemu poprawiającego zrozumiałość mowy osób laryngektomowanych (laryngektofon)" (Concept of the System for Speech Improvement after Laryngectomy - Laryngectophon), *Mat. IX Sympozjum "Nowości w Technice Audio i Wideo"* (Proc. IXth Symposium: "New Trends in Audio and Video Technology"), (Warsaw, Poland, Sept. 27-28, 2002), pp. 137-145.

[Pub87] J. Modelski: "Radioelectronics at Warsaw University of Technology", *Proc. International Conference - TCSET 2002: Modern Problems of Radio Engineering, Telecommunications and Computer Science* (Lviv-Slavisko, Ukraine, Feb. 18-23, 2002), pp. 1-5.

[Pub88] J. Modelski: "Wpływ nowych technologii na rozwój rynku usług teleinformatycznych w Polsce" (Influence of the New Technologies for Polish Data Communications Market), *Mat. Ósmego Forum Teleinformatyki,* (Legionowo, Poland, Oct. 2-4, 2002), Section 1.

[Pub89] J. Modzelewski: "Problemy zasilania rezonanowych wzmacniaczy mocy wielkiej czestotliwości klasy D i klasy DE" (Supply Problems of Class - D and Class - DE High-Frequency Runed Power Amplifiers), *Mat. I Krajowej Konferencji Elektroniki: KKE 2002* (Ist National Conference on Electronics), (Kołobrzeg-Dźwirzyno, Poland, Jun. 10-12, 2002), pp. 325-330.

[Pub90] R. Z. Morawski, A. Miękina, M. Wiśniewski, A. Barwicz: "Neural-Network-Based Calibration of a Minispectrophotometer", *Proc. IEEE Instrumentation and Measurement Technology Conference - IMT 2002* (Anchorange, Alaska, USA, May 21-23, 2002), pp. 1083-1086 (or CD-ROM).

[Pub91] R. Z. Morawski, Z. Pawłowski, K. Zaremba: "Undergraduate Studies in Biomedical Engineering at the Faculty of Electronics and Information Technology, Warsaw University of Technology", *Proc. 2002 ASEE Annual Conference* (Montreal, Canada, Jun. 16-19, 2002), Session 2109, CD-ROM#1088.

[Pub92] R. Z. Morawski, A. Kraśniewski: "Inflacja ocen - problem nie tylko amerykański" (Inflation of Marks Not Only an American Problem), *Mat. XII Ogólnopolskiego Zjazdu Dziekanów Wydziałów Elektrycznych, Elektroniki i Informatyki* (Rzeszów - Polańczyk, Poland, Jun. 3-5, 2002), pp. 27-44.

[Pub93] R. Z. Morawski, A. Miękina, M. Wiśniewski, A. Barwicz: "Neural-Network-Based Calibration of a Minispectrophotometer", *Proc. IEEE Instrumentation and Measurement Technology Conference - IMTC 2002* (Anchorange, USA, May 21-23, 2002), pp. 1083-1086.

[Pub94] T. Morawski, J. Zborowska: "Mikrofalowy transmisyjny przesuwnik fazy z diodami waraktorowymi" (Microwave Transmission Phase Shifter with Varactor Diodes), *Mat. X Krajowego Sympozjum Nauk Radiowych: URSI 2002* (Proc. Xth Union of Radio Science Symposium: URSI 2002) (Poznań, Poland, Mar. 14-15, 2002), pp. 250-253.

[Pub95] T. Morawski, J. Zborowska: "Szerokopasmowe mikrofalowe modulatory fazy z diodami waraktorowymi" (Broadband Microwave Phase Modulators with Varactor Diodes), *Mat. Krajowej Konferencji Elektroniki* (Proc. National Electronics Conference), (Kołobrzeg-Dźwirzyno, Poland, Jun. 10-12, 2002), Vol. 1/2, pp. 337-342.

[Pub96] K. Mroczek, J. Modelski: "Architektury sprzętowych rdzeni do algorytmu pasowania bloków, nowe wyniki" (Hardware Architectures for Block Matching Algorithm - Some New Results), *Mat. IV Sympozjum Naukowego: Techniki Przetwarzania Obrazu* (IVth Scientific Symposium on Image Processing Techniques), (Serock k/Warszawy, Nov. 21-23, 2002).

[Pub97] T. Olszewski, P. Brzeski, J. Mirkowski, A. Pląskowski, W. Smolik, R. Szabatin: "Capacitance Tomograph - Design and Preliminary Results", *Proc. 2nd International Symposium on Process Tomography in Poland 2002*, (Wrocław, Poland, Sept. 11-12, 2002), Oficyna Wydawnicza Politechniki Warszawskiej (Academic Publishing House), (ISBN 83-7085-643-8), pp. 159-168.

[Pub98] M. Piasecki, Y. Yashchyshyn: "Antena adaptacyjna sterowana algorytmem genetycznym" (Adaptive Antenna Controlled by Genetic Algorithm), *Mat. Krajowego Sympozjum Telekomunikacji: KST'2002* (Proc. National Symposium on Telecommunications), (Bydgoszcz, Poland, Sept. 11-13, 2002), pp. 120-127.

[Pub99] A. Pietrowcew, W. Skarbek: "Lokalna analiza składowych głównych drugiego rzędu w rozpoznawaniu twarzy" (Second Order Local Principal Component Analysis for Face Recognition), *Mat. IX Sympozjum "Nowości w Technice Audio i Wideo"* (Proc. IXth Symposium "New Trends in Audio and Video Technology"), (Warsaw, Poland Sept. 19-20, 2002), pp. 275-284.

[Pub100] A. Pietrowcew, W. Skarbek: "Lokalizacja twarzy w obrazie metoda filtrowanej transformaty Hougha" (Face Localization Using Filtered Hough Transform), *Mat. IV*

Sympozjum Naukowego: Techniki Prze-twarzania Obrazu (Proc. IVth Scientific Symposium on Image Processing), (Serock k/Warszawy, Nov. 21-23, 2002).

[Pub101] T. Piórkowski, W. Winiecki: "Bluetooth in Wireless Distributed Control and Measurement Systems", *Proc. NATO Regional Conference on Military Communications and Information Systems: RCMCIS 2002* (Zegrze, Poland, Oct. 9-11, 2002), pp. 93-99.

[Pub102] A. Płatonow, W. Winiecki, J. Nowak: "Low-power Long-range AM-transmitters with Feedback Channels", *Proc. International Conference on Signals and Electronic Systems: ICSES2002* (Wrocław, Poland, Sept. 24-27, 2002), pp. 229-234.

[Pub103] K. Radecki: "Modelowanie klasycznej lampy cezowej w fabrycznym cezowym wzorcu częstotliwości" (Modelling of Classical Caesium Lamp in Caesium Standard), *X Krajowe Sympozjum Nauk Radiowych: URSI 2002* (X[th] Union of Radio Science Symposium*: URSI 2002* (Poznań, Poland, Mar. 14-15, 2002), pp. 368-373.

[Pub104] G. Radzikowski: "Model transakcyjny płatności w sieciach bezprzewodowych 3 G" (Transaction Payment Model in Wireless 3 G Networks), *Mat. Krajowej Konferencji Radiokomunikacji, Radiofonii i Telewizji* (Proc. National Conference on Radiocommunications, Broadcasting and Television), (Gdańsk, Poland, Jun. 12-14, 2002), pp. 393-396.

[Pub105] G. Radzikowski: "The Payment Protocol in Cellular Telephone Networks", *Mat. IV Ogólnopolskich Warsztatów Doktoranckich: OWD 2002* (Proc. IVth all-Polish Workshops for Ph.D. Students), (Istebna - Zaolzie, Poland, Oct. 19-22, 2002), (ISBN 83-915991-2-4), Vol. 14, pp. 23-31.

[Pub106] J. Rudnicki, J. P. Starski: "Vertical Interconnection for Flip Chip Connection", *Proc. 14th International Conference on Microwaves, Radar and Wireless Communications: MIKON 2002* (Gdańsk, Poland, May 20-22, 2002), Vol. 3, pp. 829-832.

[Pub107] W. Skarbek: "Extending Face Recognition Descriptor Using Hierarchical Fuzzy Local PCA", contribution m9022 to 62-nd meeting of MPEG (ISO SC29/WG11), (Shanghai, China, Oct. 14, 2002).

[Pub108] W. Skarbek: "Face Recognition Experiments with Fuzzy PCA and LDA", contribution m9287 to 64-nd meeting of MPEG (ISO SC29/WG11), (Awai, Japan, Dec. 3, 2002).

[Pub109] W. Skarbek: "MPEG-7 – Nowy standard archiwizacji w radiofonii i telewizji" (MPEG-7 - The New Standard of Archivization in the Radio and the Television), *Mat. Krajowej Konferencji Radiokomunikacji, Radiofonii i Telewizji* (Proc. National Conference on Radiocommunications, Broadcasting and

Television), (Gdańsk, Poland, Jun. 12-14, 2002), invited lecture, pp. 37-42.

[Pub110] W. Skarbek: "Optymalizacja deskryptora temperatury barwowej obrazu na potrzeby wyszukiwania informacji wizualnych" (Optimization of Image Colour Temperature Descriptor for Visual Data Searching), *Mat. Krajowej Konferencji Radiokomunikacji, Radiofonii i Telewizji* (Proc. National Conference on Radiocommunications, Broadcasting and Television), (Gdańsk, Poland, Jun. 12-14, 2002), pp. 131-136.

[Pub111] W. Skarbek, M. Bober, K. Kucharski: "Fuzzy Principal Components Analysis by SVD", *Mat. IX Sympozjum "Nowości w Technice Audio i Wideo"* (Proc. IXth Symposium "New Trends in Audio and Video Technology"), (Warsaw, Poland Sept. 19-20, 2002), pp 297-306.

[Pub112] W. Skarbek, M. Bober, K. Kucharski: "Facial Image Modelling by Fuzzy LPCA of Higher Orders", *Mat. IV Sympozjum Naukowego: Techniki Przetwarzania Obrazu* (Proc. IVth Scientific Symposium on Image Processing Techniques), (Serock, Poland, Oct. 21-23, 2002).

[Pub113] W. Skarbek, P. Bobiński: "Dyskretna optymalizacja Lagrange'a w koderze JVT" (Discrete Lagrange Optimization in JVT Encoder), *Mat. Krajowej Konferencji Radiokomunikacji, Radiofonii i Telewizji* (Proc. National Conference on Radiocommunications, Broadcasting and Television), (Gdańsk, Poland, Jun. 12-14, 2002), pp. 123-126.

[Pub114] W. Skarbek, T. Keller: "MPEG-7 w archiwizacji multimediów" (MPEG-7 in Multimedia Information Archivization), *Mat. III Krajowej Konferencji: Multimedialne i Sieciowe Systemy Informacyjne*, (Proc. 3rd National Conference: Multimedia and Network Information Systems), (Wrocław, Poland, Sept. 19-20, 2002), invited lecture, pp. 33-51.

[Pub115] W. Skarbek, K. Kucharski, M. Bober: "Fuzzy Principal Components Analysis by SVD", *Mat. IX Sympozjum "Nowości w Technice Audio i Wideo"* (Proc. IXth Symposium: "New Trends in Audio and Video Technology"), (Warsaw, Poland, Sept. 27-28, 2002), pp. 297-305.

[Pub116] W. Skarbek, A. Pietrowcew, M. Polak, K. Ignasiak: "Lokalna analiza składowych głównych w rozpoznawaniu twarzy" (Local Principal Component Analysis for Face Recognition), *Mat. Krajowej Konferencji Radiokomunikacji, Radiofonii i Telewizji* (Proc. National Conference on Radiocommunications, Broadcasting and Television), (Gdańsk, Poland, Jun. 12-14, 2002), pp. 137-140.

[Pub117] R. Smoliński: "Wpływ rodzaju kodera na jakość techniczną plików dźwiękowych w formacie MPEG Layer III (MP3)" (Coder Type Influence on Technical Quality of Sound Files in MPEG Layer III (MP3)

Format), *Mat. IX Sympozjum "Nowości w Technice Audio i Wideo"* (Proc. IXth Symposium: "New Trends in Audio and Video Technology"), (Warsaw, Poland, Sept. 27-28, 2002), pp. 165-172.

[Pub118] E. Snitkowska: "Deskryptory tekstury w analizie obrazów angiograficznych" (Texture Descriptors in Analysis of Angiographic Images), *Mat. IX Sympozjum "Nowości w Technice Audio i Wideo"* (Proc. IXth Symposium: "New Trends in Audio and Video Technology"), (Warsaw, Poland, Sept. 27-28, 2002), pp. 307-315.

[Pub119] P. Stańczykowski, M. Rzewuski, Z. Walczak: "Zastosowanie systemu GPS i sieci GSM do śledzenia i nawigacji flota pojazdów" (Applications of GPS and GSM to Vehicle Fleet Navigation and Management), *Mat. Krajowej Konferencji Radiokomunikacji, Radiofonii i Telewizji* (Proc. National Conference on Radiocommunications, Broadcasting and Television), (Gdańsk, Poland, Jun. 12-14, 2002), pp. 245-248.

[Pub120] T. Trepka, Y. Yashchyshyn; "Dwupasmowa antena UDA YAGI GSM 900/1800 MHz" (The GSM 900/1800 MHz Dual-band UDA YAG Antenna), *Mat. Krajowej Konferencji Radiokomunikacji, Radiofonii i Telewizji: KKRRiT 2002* (Proc. National Conference on Radiocommunications, Broadcasting and Television), (Gdańsk, Poland, Jun. 12-14, 2002), pp. 57-59.

[Pub121] R. Ulinowicz: "Symulacja komputerowa modulatorów Sigma-Delta stosowanych w przetwarzaniu A/C i C/A sygnałów fonicznych wraz z implementacją wybranego typu modultora na procesorze sygnałowym" (Computer Simulations of Sigma-Delta Modulators used in A/C and C/A Audio Converters in Audio Applications), *Mat. III Seminarium - Radiokomunikacja i Techniki Multimedialne* (Proc. IIIrd Seminar - Radiocommunications and Multimedia Technologies), (Warsaw, Poland, Dec. 4, 2002), (ISBN 83-916802-9-0), pp. 133-138.

[Pub122] W. Winiecki: "Metoda analizy czasowej przyrządów wirtualnych realizowanych w graficznych, zintegrowanych środowiskach programowych" (Time-Analysis Method for Virtual Instruments in Graphical, Integrated Programme Environment), *Mat. III Seminarium - Radiokomunikacja i Techniki Multimedialne* (Proc. IIIrd Seminar - Radiocommunications and Multimedia Technologies), (Warsaw, Poland, Dec. 4, 2002), (ISBN 83-916802-9-0), pp. 65-74.

[Pub123] K. Wnukowicz, W. Skarbek: "Procedura estymacji temperatury barwowej obrazu" (The Procedure of Image Colour Temperature Estimation), *Mat. IV Sympozjum Naukowego: Techniki Przetwarzania Obrazu* (Proc. IVth Scientific Symposium on Image Processing Techniques), (Serock k/Warszawy, Nov. 21-23, 2002).

[Pub124] W. Wojtasiak: "Tranzystory mikrofalowe - technologia, parametry i zastosowania" (Microwave Transistors - Technique, Parameters and Applications), *Mat. Krajowej Konferencji Elektroniki* (Proc. National Electronics Conference), (Kołobrzeg-Dźwirzyno, Poland, Jun. 10-12, 2002), Vol. 1/2, pp. 79-84.

[Pub125] W. Wojtasiak, D. Gryglewski, T. Morawski, E. Sędek: "A 300W-band Solid-state Transmitter", *Proc. 14th International Conference on Microwaves, Radar and Wireless Communications: MIKON 2002* (Gdańsk, Poland, May 20-22, 2002), Vol. 1, pp. 263-266.

[Pub126] W. Wojtasiak, D. Gryglewski, T. Morawski, E. Sędek: "Designing T/R Module for Active Phased Array Radar", *Proc. 14th International Conference on Microwaves, Radar and Wireless Communications: MIKON 2002* (Gdańsk, Poland, May 20-22, 2002), Vol. 2, pp. 631-634.

[Pub127] W. Wojtasiak, D. Gryglewski: "Dwuzakresowy nadajnik zakłóceń szumowych 900/1800MHz" (Two-ranged Transmitter 900/1800MHz for Noise Interference), *Mat. Krajowej Konferencji Elektroniki* (Proc. National Electronics Conference), (Kołobrzeg-Dźwirzyno, Poland, Jun. 10-12, 2002), Vol. 1/2, pp. 355-359.

[Pub128] J. Woźnicki, R. Z. Morawski: "Public and Private Higher Education Institutions: Joint or Separate Evaluation and Ranking - the Polish Perspective", *Statistical Indicators for Quality Assessment of Higher/Tertiary Education Institutions - Ranking/League Tables Methodologies,* Invitational Roundtable organised by the UNESCO-CEPES and Leon Kozminski Academy of Entrepreneurship and Management (Warsaw, Poland, Jun. 13-15, 2002), CD-ROM.

[Pub129] W. Wróblewski, A. Leszczyński: "System do pomiarów elektroakustycznych zintegrowany w sieci komputerowej" (System for Electroacoustic Tests Integrated with Computer Network), *Mat. IX Sympozjum "Nowości w Technice Audio i Wideo"* (Proc. IXth Symposium: "New Trends in Audio and Video Technology"), (Warsaw, Poland, Sept. 27-28, 2002), pp. 189-200.

[Pub130] A. Wróblewska, A. Przelaskowski: „System automatycznej detekcji i klasyfikacji mikrozwapnień w cyfrowej mammografii" (Computer Aided Detection of Microcalcifications in Digital Mammography), *Mat. IV Sympozjum Naukowego: Techniki Przetwarzania Obrazu* (IVth Scientific Symposium on Image Processing Techniques), (Serock k/Warszawy, Nov. 21-23, 2002).

[Pub131] S. Wydra: "Ocena jakości odtwarzania polskiej mowy przez kodek AMR przeprowadzona subiektywna metodą ACR", (Estimation of Polish Speech Quality by AMR Codec Using ACR Subjective Method), *Mat. Krajowej Konferencji Radiokomunikacji, Radiofonii i Telewizji: KKRRiT 2002* (Proc.

National Conference on Radiocommunications, Broadcasting and Television), (Gdańsk, Poland, Jun. 12-14, 2002), pp 279-282.

[Pub132] S. Wydra: "Badanie jakości odtwarzania polskiej mowy przez kodek AMR przeprowadzone metodą subiektywną" (Investigation of Polish Speech Recording by AMR Codec Using Subjective Method), *Mat. III Seminarium - Radiokomunikacja i Techniki Multimedialne* (Proc. IIIrd Seminar - Radiocommunications and Multimedia Technologies), (Warsaw, Poland, Dec. 4, 2002), (ISBN 83-916802-9-0), pp. 81-88.

[Pub133] Y. Yashchyshyn, J. Modelski: "FDTD Analysis of the Leaky-wave Antenna Using Ferroelectric", *Proc. International Conference - TCSET 2002: Modern Problems of Radio Engineering, Telecommunications and Computer Science* (Lviv-Slavisko, Ukraine, Feb. 18-23, 2002), pp. 164-166.

[Pub134] Y. Yashchyshyn, J. Modelski: "The Leaky-Wave Antenna with Ferroelectric Substrate), *Proc. 14th International Conference on Microwaves, Radar and Wireless Communications: MIKON 2002* (Gdańsk, Poland, May 20-22, 2002), Vol. 1, pp. 218-221.

7. REPORTS

7.1. Research reports

[Rep1]   A. Buchowicz, R. Pączkowski, B. Staniszewski, K. Dudało: *"Domowa platforma multimedialna w systemie telewizji kablowej"* (Multimedia Home Platform in Cable TV Network), Final report for the statutory grant, Institute of Radioelectronics, WUT, (No. 504G/1034/0401), Warsaw, Apr. 2002, 10 pp.

[Rep2]   T. Buczkowski, D. Janusek: *"Stanowisko do badania pól elektromagnetycznych z wykorzystaniem "sztucznego człowieka"* (A Stand for Investigation of Electromagnetic Fields Using "Human Dummy"), Final report for the Dean grant, Institute of Radioelectronics, WUT, (No. 503G/1034/4032), Warsaw, May 2002, 12 pp.

[Rep3]   J. Ebert, M. Mikołajewski, J. Modzelewski, K. Puczko, A. Wajs: *"Optymalizacja i metody projektowania rezonansowych wzmacniaczy mocy wielkiej częstotliwości"* (Optimisation and Designing Methods of High-frequency Tuned Amplifiers), Final report for the statutory grant, Institute of Radioelectronics, WUT, (No. 504G/1034/0401), Warsaw, Apr. 2002, 38 pp.

[Rep4]   S. L. Hahn, K. Snopek: "The Analytic, Quaternonic and Monogenic 2-D Complex Delta Distributions", Internal report (No. 3), Institute of Radioelectronics, WUT, Warsaw, Apr. 2002, 7 pp.

[Rep5]   S. L. Hahn: "Wigner Distributions and Ambiguity Functions of 2-D Quaternonic and Monogenic Complex Signals", Internal report (No. 4), Institute of Radioelectronics, WUT, Warsaw, Apr. 2002, 10 pp.

[Rep6]   S. L. Hahn, A. Buchowicz: "Wigner Distributions of Complex Multi-dimensional Analytic Signals", Internal report, (No. 5), Institute of Radioelectronics, WUT, Warsaw, Oct. 2002, 24 pp.

[Rep7]   S. L. Hahn, J. Jarkowski, K. Snopek, G. Hahn: *"Podwójnie wymiarowe rozkłady klasy Cohena. Badania własności oraz zastosowań"* (Double-Dimensional Cohen's Class Distributions. Studies of Properties and Applications), Final report for the KBN grant, Institute of Radioelectronics, WUT, Warsaw, May 2002, 38 pp.

[Rep8]   K. Ignasiak, K. Cichoń, K. Wnukowicz, M. Ceremuga, A. Żołądkiewicz, J. Januszkiewicz: *"Analiza i projektowanie rozproszonych aplikacji bazodanowych"* (Analysis and Development of Distributed Database Applications), Final report for the statutory grant, Institute of Radioelectronics, WUT, (No. 504G/1034/ 0401), Warsaw, Apr. 2002, 6 pp.

[Rep9]   J. Kołakowski, J. Cichocki, D. Grabowski, S. Maszczyk: *"Wykorzystanie przekształceń czasowo-częstotliwościowych i technik od-biornika programowego (software radio) do analizy szerokopasmowych emisji radiowych"* (Application of Time-frequency Transforms and Software Radio Techniques for Analysis of Broadband Radio Emissions), Final report for the Dean grant, Institute of Radioelectronics, WUT, (No. 503G/1034/ 4027), Warsaw, Jun. 2002, 52 pp.

[Rep10] T. Kosiło, D. Janusek: *"Radiowe systemy identyfikacyjne (RFID)"* (Radio Identification Systems), Final report for the Dean grant, Institute of Radioelectronics, WUT, (No. 503G/1034/4028), Warsaw, Jun. 2002, 85 pp.

[Rep11] K. Kowalski: *"Przeprowadzenie analizy i badań aparatury pokładowej (AP1) rakiet przeciwlotniczych KRUG przed próbami poligonowymi wraz z opracowaniem programu i metodyki badań"* (Analysis and Testing of Board Equipment Before Fire Tests and Design of Programme and Methodology), Final report for the Military Institute of Armament Technology (Wojskowy Instytut Techniczny Uzbrojenia), (No. 501E/1034/ 1355), Warsaw, Aug. 2002, 50 pp.

[Rep12] Z. Kulka, A. Leszczyński, M. Tajchert, J. Narkiewicz-Jodko, P. Nykiel: *"Projektowanie i badania systemów elektroakustycznych oraz systemów cyfrowego przetwarzania sygnałów fonicznych"* (Design and Investigation of Electroacoustic Measuring Systems and Digital Audio Signal Processing Systems), Final report for the statutory grant, Institute of Radioelectronics, WUT, (No. 504G/1034/ 0401), Warsaw, Apr. 2002, 84 pp.

[Rep13] Z. Kulka, P. Nykiel, R. Ulinowicz: *"Badania symulacyjne i optymalizacja modulatorów delta-sigma z ditherowanymi kwantyzatorami przeznaczonymi do cyfrowych systemów fonicznych"*, (Investigation and Optimization of 1- and Few-Bit Dithered Delta-Sigma Modulators for Digital Audio Applications), Final report for the Dean grant, Institute of Radioelectronics, WUT, (No. 503G/1034/ 4033), Warsaw, May 2002, 49 pp.

[Rep14] Z. Kulka: *"Przeprowadzenie nagrań oraz wykorzystanie urządzeń i aparatury do obróbki dźwięku"* (Recording and Processing of Sound Materials in Electroacoustics Division Studio), Final report for Central Examination Commission (Centralna Komisja Egzaminacyjna), (No. 501H/1034/1349), Warsaw, Feb. 2002, 10 pp.

[Rep15] Z. Kulka: *"Pomiary akustyczne i elektroakustyczne systemów komputerowych"* (Acoustic and Electroacoustic Measurements of Noise Emitted by Computer Systems), Final report for Axel Springer Poland Ltd, (No. 501H/1034/1357), Warsaw, Dec. 2003, 15 pp.

[Rep16] A. Leszczyński: *"Program nauczania zawodu protetyk słuchu"* (The Programme Basis for Hearing Instruments Specialist), Final report for the Ministry of National Education and

Sport (Ministerstwo Edukacji i Sportu), (No. 501E/1034/ 1354), Warsaw, Dec. 2002, 66 pp.

[Rep17] A. Leszczyński: *"Podstawa programowa kształcenia w zawodzie protetyk słuchu"* (The Education Programme for Hearing Instruments Specialist), Final report for the Ministry of National Education and Sport (Ministerstwo Edukacji i Sportu), (No. 501E/ 1034/1353), Warsaw, Nov. 2002, 14 pp.

[Rep18] J. Marzec, K. Zaremba, Z. Pawłowski, B. Konarzewski: "Noise and Electromagnetic Interference in the Straw Chambers - Results of Measurements and Analysis", CERN/ COMPASS Note 2002-2003, CERN, Genewa 2002.

[Rep19] J. Marzec, Z. Pawłowski, K. Zaremba, B. Konarzewski, G. Domański, E. Demczuk: „Optymalizacja sensorów obrazu do radiograficznych systemów obrazowania przeznaczonych do diagnozowania osteoporozy" (Optimization of Image Sensors for Radiographic Imaging Systems for Osteoporosis Screening), Final report for the the KBN grant, Institute of Radioelectronics, WUT, Warsaw, Sept. 2002, 144 pp.

[Rep20] J. Modelski, M. Szafran, Y. Yashchyshyn, K. Derzakowski, E. Bobryk: *"Nowa generacja ferroelektryków mikrofalowych dla nowoczesnej radiokomunikacji"* (New Generation of Microwave Ferrrolectric Materials for Modern Radiocommunications), Final report for the Rector grant, Institute of Radioelectronics, WUT, (No. 503G/1034/3946), Warsaw, May 2002, 16 pp.

[Rep21] J. Modelski, Y. Yashchyshyn, M. Szafran, K. Derzakowski, E. Bobryk, H. Chaciński, M. Piasecki, A. Mędrzak, A. Tomaszewska-Grzęda: *"Nowe rodzaje sterowanych anten mikrofalowych na podłożu wielowarstwowym"* (New Kinds of Steerable Microwave Antenna with Multilayer Substrate), Final report for the KBN grant, Institute of Radioelectronics, WUT, Warsaw, Mar. 2002.

[Rep22] J. Modelski, K. Kurek: *"Analiza szerokopasmowych właściwości kanału propagacyjnego wewnątrz budynków w systemach łączności bezprzewodowej"* (Analysis of Wideband Properties of the Indoor Propagation Channel in Wireless Communication Systems), Final report for the KBN grant, Institute of Radioelectronics, WUT, Warsaw, Mar. 2002.

[Rep23] R. Z. Morawski, A. Miękina, A. Podgórski, T. Szafrański: *"Realizacja i badanie wybranych algorytmów interpretacji danych pomiarowych"* (Implementation and Investigation of the Selected Algorithms for Interpretation of Measurement Data), Final report for the statutory grant, Institute of Radioelectronics, WUT, (No. 504G/1034/0401), Warsaw, Apr. 2002, 54 pp.

[Rep24] T. Morawski, W. Wojtasiak, W. Gwarek, S. Rosłoniec, K. Robaczyński: *"Projektowanie, modelowanie i pomiary układów mikrofalowych"* (Design, Modelling and Measuring the Microwave Devices), Final report for the statutory grant, Institute of Radioelectronics, WUT, (No. 504G/1034/ 0401), Warsaw, Apr. 2002, 26 pp.

[Rep25] Z. Pawłowski, J. Marzec, K. Zaremba, B. Konarzewski, A. Piątkowski, G. Domański, P. Bogorodzki, E. Piątkowska-Janko, T. Wolak, M. Kazubek, T. Jamrógiewicz, A. Przelaskowski, L. Padee, R. Szabatin, P. Brzeski, W. Smolik, T. Olszewski: *"Metody radiacyjne w technikach medycznych"* (Radiation Methods in Medical Techniques), Final report for the statutory grant, Institute of Radioelectronics, WUT, (No. 504G/1034/0401), Warsaw, Apr. 2002, 42 pp.

[Rep26] M. Piasecki: *"Badanie anten inteligentnych sterowanych algorytmem genetycznym"* (Improved Model of Adaptive Antenna Controlled by Means of Genetic Algorithm), Final report for the KBN grant, Institute of Radioelectronics, WUT, (No. 513G/1034/ 1303), Warsaw, Jul. 2002, 35 pp.

[Rep27] A. Pląskowski, B. Florczak, T. Piotrowski, R. Szabatin, J. Mirkowski, W. Witkowski, M. Sałaciński: „Nowa metoda badań dynamiki spalania mieszanin paliwowo-powietrznych oraz badań stałych paliw rakietowych" (The New Method of Examination for Dynamic Combustion Process of Fuel-air Mixture and Rocket Solid Fuel), Final report for the KBN grant, Instytutu Przemysłu Organicznego (Institute of Industrial Organic Chemistry), Warsaw, Jan. 2002, 190 pp.

[Rep28] K. Radecki, D. Wasiak, A. Moryc: *"Model komputerowy lampy cezowej w cezowym wzorcu częstotliwości"* (Computer Model of Caesium Lamp in Caesium Frequency Standard), Final report for the Dean grant, Institute of Radioelectronics, WUT, (No. 503G/1034/4034), Warsaw, May 2002, 27 pp.

[Rep29] W. Skarbek: *"Implementacja kodera H26L na platformie Equator"* (Implementation of the H26L Coder Based on Equator Technology), Final report for the Arris Lisle, USA, (No. 501M/1034/1350), Warsaw, Dec. 2002, 15 pp.

[Rep30] W. Smolik, R. Szabatin, P. Brzeski, T. Olszewski: *"Akwizycja i rekonstrukcja obrazów tomograficznych SPECT na bazie gammakamery Omega 500"* (Data Acquisition and Tomographic Image Reconstruction based on gammacamera Omega 500), Final report for the Dean grant, Institute of Radioelectronics, WUT, (No. 503G/ 1034/4031), Warsaw, May, 38 pp.

[Rep31] R. Szabatin, W. Smolik, D. Radomski: *"Staty-styczne metody przetwarzania i oceny obrazów medycznych"* (Statistic Methods of Medical Images Processing and Estimation), Final report for the Rector grant, Instutute of Radioelectronics, WUT, (No. 503R/1034/4037), Warsaw, Dec. 2002, 57 pp.

[Rep32] R. Szabatin: *"Opracowanie dokumentacji technicznej oraz wykonanie dwóch prototypowych egzemplarzy wielokanałowego, pojemnościowego układu pomiarowego do badania procesów w przepływowym separatorze mieszaniny ropy, gazu, wody i zawiesiny stałej"* (Design of the Technical Documentation and Two Prototypes of Multichannel Electronic Capacitance Meter for Oil, Water, Gas and Solid Suspension Separation Study), Final report for MIKROMAX Ltd., (No. 501E/1034/1351), 6 pp.

[Rep33] W. Winiecki, A. Płatonow, K. Jędrzejewski, H. Chaciński, R. Leoniak, R. Łukaszewski: *"Opracowanie metod i środków zwiększenia efektywności bezprzewodowych systemów monitorowania środowiska"* (Methods and Tools for Increasing Effectiveness of Wireless Environment Monitoring Systems), Final report for the Dean grant, Institute of Radioelectronics, WUT, (No. 503G/1034/4030), Warsaw, Jun. 2002, 148 pp.

[Rep34] W. Winiecki, K. Adamowicz, P. Bilski, R. Leoniak, R. Łukaszewski, J. Nowak: *"Nowoczesne metody projektowania komputerowych systemów pomiarowych"* (Modern Methods of Computer Measuring Systems Designing), Final report for the statutory grant, Institute of Radioelectronics, WUT, (No. 504G/1034/0401), Warsaw, Apr. 2002, 34 pp.

[Rep35] J. Wojciechowski, J. Cichocki, J. Kołakowski, K. Radecki, S. Żmudzin, D. Grabowski, S. Maszczyk, T. Kosiło, T. Buczkowski, K. Czerwiński, W. Kazubski, D. Janusek, F. Alwafie, J. Jarkowski, H. Chaciński, Z. Walczak: *"Cyfrowa transmisja radiowa"* (Digital Radiocommunications), Final report for the statutory grant, Institute of Radioelectronics, WUT, (No. 504G/1034/0401), Warsaw, Apr. 2002, 73 pp.

[Rep36] W. Wojtasiak:, D. Gryglewski, M. Lubiejewski, R. Michnowski: *"Opracowanie i wykonanie modeli modułów nadawczo-odbiorczych na pasmo C"* (C Band T/R Modules Design and Perform), Final report for the Industrial Institute of Telecommunications (Przemysłowy Instytut Telekomunikacji), (No. 501E/1034/1352), Warsaw, Nov. 2002, 12 pp.

[Rep37] W. Wojtasiak:, D. Gryglewski, M. Lubiejewski, R. Michnowski: *"Opracowanie modułu up-conwertera na pasmo L"* (L Band Up-Converter Design), Final report for Microwave Systems Poland Ltd, (No. 501E/1034/1356), Warsaw, Nov. 2002, 10 pp.

[Rep38] K. Zaremba, Z. Pawłowski, J. Marzec, B. Konarzewski, G. Domański, E. Piwowarska, W. Pleskacz, A. Jarosz, A. Wałkanis: *"Opracowanie scalonego układu odczytu danych detektorów gazowych dla eksperymentów fizyki wysokiej energii"* (Design of the Integrated Circuit for the Read-out System of Gas Detection Used in the High-Energy Physics Experiments), Final report for the Dean grant, Institute of Radioelectronics, WUT, (No. 503G/1034/4029), Warsaw, Jun. 2002, 3

8. CONFERENCES, SEMINARS AND MEETINGS

8.1. International conferences

[Con1] *IEEE International Microwave Symposium, and Industrial Microwave Modelling Group Workshop* (Seattle, USA, Jan. 4-13, 2002), W. Gwarek, J. Modelski (TPC members).

[Con2] *International Conference - TCSET 2002: Modern Problems of Radio Engineering, Telecommunications and Computer Science* (Lviv-Slavisko, Ukraine, Feb. 18-23, 2002), J. Modelski, Y. Yashchyshyn (speakers).

[Con3] *European Symposium on Numerical Methods in Electromagnetics: JEE'02* (Tuluse, France, Mar. 6-8, 2002), P. Kopyt (speaker).

[Con4] *14th International Conference on Microwaves, Radar and Wireless Communications: MIKON 2002* (Gdańsk, Poland, May 20-22, 2002), J. Modelski (chairman of the TPC), W. Gwarek (member of the TPC), T. Morawski, W. Skarbek P. Bobiński, M. Celuch-Marcysiak, K. Cichoń, K. Derzakowski, D. Gryglewski, D. Janusek, T. Keller, P. Kopyt, M. Kukier K. Kurek, R. Michnowski, J. Rudnicki, W. Wojtasiak, K. Wnukowicz, G. Galiński, Y. Yashchyshyn (speakers).

[Con5] *IEEE Instrumentation and Measurement Technology Conference - IMT 2002* (Anchorange, Alaska, USA, May 21-23, 2002), R. Z. Morawski (TPC member, session chairman, speaker).

[Con6] *IEEE MTT-S: International Microwave Symposium* (Seattle, Washington, USA, May 31 - Jun. 9, 2002), W. Gwarek (TPC member, speaker), J. Modelski (TPC member, session chairman, speaker).

[Con7] *2002 ASEE Annual Conference* (Montreal, Canada, Jun. 15-21, 2002), K. Zaremba (speaker).

[Con8] *Towards an Integrated Infrastructure for Measurements* (Warsaw, Poland, Jun. 18-19, 2002), R. Szabatin (participant).

[Con9] *16th International Wroclaw Symposium and Exhibition of Electromagnetic Compatibility 2002* (Wrocław, Poland, Jun. 25-128, 2002), S. Maszczyk (speaker).

[Con10] *Joint IMEKO TC-1 & XXXIV MKM Conference 2002: Education in Measurements and Instrumentation - Challenges of New Technologies* (Wrocław, Poland, Sept. 8-12, 2002), W. Winiecki (speaker).

[Con11] *Forum Acousticum* (Sewilla, Spain, Sept. 15-22, 2002), E. Kotarbińska (speaker).

[Con12] *European Microwave Conference, and European Wireless Week* (Milano, Italy, Sept. 23-27, 2002), J. Modelski (session chairman, member of the TPC and speaker), K. Kurek (speaker).

[Con13] *International Conference on Signals and Electronic Systems: ICSES2002* (Wrocław, Poland, Sept. 24-27, 2002), J. Wojciechowski, A. Płatonow (speakers).

[Con14] *12th IMEKO TC-4 Symposium: Electrical Measurements and Instrumentation* (Zagreb, Croatia, Sept. 25-27, 2002), W. Kiełek (speaker).

[Con15] *2 International Symposium on Process Tomography* (Wrocław, Poland, Sept. 11-12, 2002), R. Szabatin, W. Smolik, T. Olszewski, J. Mirkowski (participants).

[Con16] *NATO Regional Conference on Military Communications and Information Systems: RCMCIS'2002* (Zegrze, Poland, Oct. 9-11, 2002), J. Modelski (member of the TPC), W. Winiecki (speakers), T. Knyziak (participant).

[Con17] *Conference: Information Day on the Early Stages of Implementation of IST Programme 2002 - 2006* (Luxemburg, the Principality of Luxemburg, Oct. 22-27, 2002), K. Zaremba (participant).

[Con18] *2002 Asia-Pacific Microwave Conference: APMC 2002* (Kyoto, Japan, Nov. 19-22, 2002), J. Modelski (speaker).

[Con19] *Międzynarodowa Konferencja Projektu Ideal-IST: Przyjazne Społeczeństwo Informacyjne (IST) w Szóstym Programie Ramowym Unii Europejskiej* (Ideal-IST International Conference: Information Society Technologies in the Sixth Framework Programme), (Warsaw, Poland, Nov. 19-21, 2002), K. Zaremba (participant).

[Con20] *2nd European Medical & Biological Engineering Conference: EMBEC 2002* (Vienna, Austria, Dec. 3-9, 2002), E. Piątkowska-Janko, T. Wolak (participants).

8.2. Local conferences

[Con21] *X Krajowe Sympozjum Nauk Radiowych: URSI 2002* (Xth Union of Radio Science Symposium*: URSI 2002* (Poznań, Poland, Mar. 14-15, 2002), J. Modelski, T. Kosiło, K. Radecki (session chairman, speaker), J. Jarkowski, K. Derzakowski, F. Alwafi (participants).

[Con22] *Warsztaty Algorytmów Genetycznych* (Workshops on Genetic Algorithms), (Bielsko-Biała - Szyndzielnia, Poland, Apr. 26-27, 2002), P. Miazga, M. Piasecki (participants).

[Con23] *I Krajowa Konferencja Elektroniki: KKE 2002* (Ist National Conference on Electronics), (Kołobrzeg-Dźwirzyno, Poland, Jun. 10-12, 2002), J. Zborowska, T. Morawski, W. Wojtasiak, M. Mikołajewski, J. Modzelewski (speakers).

[Con24] *Krajowa Konferencja Radiokomunikacji, Radiofonii i Telewizji: KKRRiT 2002* (National Conference on Radiocommunications, Broadcasting and Television), (Gdańsk, Poland, Jun. 12-14, 2002), J. Modelski (member of the TPC and speaker), W. Skarbek (member of TPC and speaker), J. Cichocki, J. Kołakowski (speaker), J. Jarkowski, T. Kosiło, M. Konwicki, D. Grabowski, S. Maszczyk (speaker), G. Radzikowski (speaker).

[Con25] *IV Konferencja: Systemy Pomiarowe w Badaniach Naukowych i w Przemyśle* (IVth Conference on Measuring Systems in Research and Industry), (Zielona Góra, Poland, Jun. 23-27, 2002), W. Winiecki (member of Scientific Committee).

[Con26] *IT Security Conference 2002* (Pułtusk, Poland, Sept. 9-11, 2002), G. Radzikowski (conference chairman, speaker).

[Con27] *Krajowe Sympozjum Telekomunikacji - KST'2002* (National Symposium on Telecommunications), (Bydgoszcz, Poland, Sept. 11-13, 2002), J. Modelski (member of the TPC and MC), J. Jarkowski, M. Konwicki (speakers).

[Con28] *III Krajowa Konferencja: Multimedialne i Sieciowe Systemy Informacyjne: MISSI 2002* (IIIrd National Conference: Multimedia and Network Information Systems), (Wrocław, Poland, Sept. 19-20, 2002), K. Cichoń, W. Skarbek, P. Bobiński, G. Galiński, K. Wnukowicz (speakers).

[Con29] *IX Sympozjum "Nowości w Technice Audio i Wideo"* (IXth Symposium: "New Trends in Audio and Video Technology"), (Warsaw, Poland, Sept. 27-28, 2002), Z. Kulka, W. Skarbek (co-chairmen of the Scientific Committee, members of the Organizing Committee), J. Modelski (member of the Scientific Committee), M. Tajchert (member of the Organizing Committee), (participants). **Conference organized by the Institute.**

[Con30] *VI Kongres Polskiego Stowarzyszenia Protetyków Słuchu* (VIth Congress of the Polish Association of Hearing Instruments Specialists), (Dębe, nearby Warsaw, Poland, Sept. 28-29, 2002), A. Leszczyński (speaker).

[Con31] *I Konferencja Radio - Teleinformatyczna: Radiofonia, Telewizja, Internet - coraz większe możliwości* (I[st] Radio - Data Communications Conference: Broadcasting, Television, Internet - More and More Possibilities), (Toruń, Poland, Oct. 10-11, 2002), T. Keller (participant).

[Con32] *IV Ogólnopolskie Warsztaty Doktoranckie: OWD 2002* (IVth all-Polish Workshops for Ph.D. Students), (Istebna-Zaolzie, Poland, Oct. 19-22, 2002), G. Radzikowski (speaker).

[Con33] *Technological Congress: Solutions for the Modern Economy* (Kongres Technologiczny: "Rozwiązania dla Nowoczesnej Gospodarki"), (Warszawa, Poland, Oct. 29, 2002), S. L. Hahn (participant).

[Con34] *IV Sympozjum Naukowe: Techniki Przetwarzania Obrazu* (IVth Scientific Symposium on Image Processing Techniques), (Serock k/Warszawy, Nov. 21-23, 2002), P. Boniński, P. Bobiński, G. Domański, G. Galiński, K. Ignasiak, T. Olszewski, W. Skarbek W. Smolik, (speakers), A. Wróblewska, A. Przelaskowski (participants).

[Con35] *II Krajowa Konferencja Naukowo - Techniczna: Ekologia w Elektronice* (IInd National Scientific and Technical Conference: Ecology in Electronics), (Warsaw, Poland, Dec. 5-6, 2002), T. Buczkowski (speaker).

8.3. Schools, seminars and meetings

[Con36] *IEEE International Microwave Symposium, and Industrial Microwave Modelling Group Workshop* (Seattle, USA, Jan. 4-13, 2002), W. Gwarek, J. Modelski (TPC members).

[Con37] *European Symposium on Numerical Methods in Electromagnetics* (Tuluse, France, Mar. 5-11, 2002), P. Kopyt (speaker).

[Con38] *Warsztaty Algorytmów Genetycznych* (Workshops on Genetic Algorithms), (Bielsko-Biała - Szyndzielnia, Poland, Apr. 26-27, 2002), P. Miazga, M. Piasecki (participants).

[Con39] *Technical Programme Committee Meeting of European Conference: GAAS'03* (Freiburg, Germany, Nov. 29-Dec. 1, 2002), J. Modelski (TPC member).

[Con40] *III Seminarium - Radiokomunikacja i Techniki Multimedialne* (IIIrd Seminar - Radiocommucations and Multimedia Technologies), (Warsaw, Dec. 4, 2002), W. Winiecki, P. Bobiński, G. Galiński, D. Janusek, T. Knyziak, K. Kurek, S. Maszczyk, S. Wydra, R. Ulinowicz (speakers).

9. THE PRIZES AND DISTINCTIONS RECEIVED BY THE STAFF

9.1. State Orders and Medals

Roman Z. Morawski, Prof., D.Sc.,
Krzyż Kawalerski Orderu Odrodzenia Polski

Piotr Brzeski, Ph.D.,
Wojciech Gwarek, Prof., D.Sc.,
Golden Order of Merit

Andrzej Skrzypkowski
Brown Order of Merit

9.2. Awards of the Rector

Tadeusz Morawski, Prof., D.Sc.,
Individual award (I^0) for the didactic achievements in the field of microwave technique.

Andrzej Leszczyński, Ph.D.,
Individual award (I^0) for the research project: *"Audio test signals elaborations and CD test design for behavioural tests of hearing in small children"* (Opracowanie sygnałów testujących i wykonanie płyty testowej CD do badania właściwości słuchu małych dzieci).

Ewa Piątkowska-Janko, Ph.D.,
Individual award (II^0) for the doctoral thesis: *"Multidimensional analysis of variance and discrimination for evaluation of electrical instability of the heart"* (Wielowymiarowa analiza dyskryminacyjna w zastosowaniu do badania w dziedzinie czasu niestabilności elektrycznej serca).

Grzegorz Domański, Ph.D.,
Individual award (II^0) for the doctoral thesis: *"Optimization of the bone density scanning system methods"* (Optymalizacja skaningowych radio-graficznych metod badania gęstości tkanek kostnych).

Daniel Gryglewski, Ph.D.,
Individual award (II^0) for the doctoral thesis: *"The minimization of microwave impulse high power A class amplifier"* (Minimalizacja zmian transmitancji mikrofalowych impulsowanych wzmacniaczy mocy klasy A).

Dariusz Radomski, Ph.D.,
Individual award (II^0) for the research achievements related to the scope of nuclear and medical electronics.

Karol Radecki, Ph.D.,
Wojciech Kazubski, Ph.D.,
Henryk Chaciński, MSc.,
Team award (I^0) for the great deal of effort in tutorial assistance referring to the didactic project called Radiocommunication Laboratories.

Wiesław Winiecki, Ph.D.,
Jacek Nowak, MSc.,
Sławomir Stanik MSc.,
Team award (II^0) for the monography: *"Graphical integrated software environments for computer-based measuring system design"* (Graficzne, zintegrowane środowiska programowe do projektowania komputerowych systemów pomiarowo-kontrolnych), *Ed. MIKOM*, Warsaw, 2001, Issue I, (ISBN 83-7279-178-3), 288 pp.

9.3. Awards granted by the Foundation for the Development of Radio-communications and Multimedia Technologies received by the Ph.D. students for the best conference papers

Grzegorz Galiński, M.Sc.,
The third award for the conference paper titled: *Compression of movement trajectory descriptor* (Kompresja deskryptora trajektorii ruchu), Proc. National Conference on Radiocommunications, Broadcasting and Television (Mat. Krajowej Kon-ferencji Radiokomunikacji, Radiofonii i Telewizji: KKRRiT'2002), Gdańsk, Poland, Jun. 12-14, 2002)

10.   STATISTICAL DATA

SPECIFICATION	2000	2001	2002
academic staff total	60,23	58.83	59,43
tenured professors	4	3.5	3,6
professors	7	7	6
assistant professors	41	41,5	43
senior lecturers	6,33	5,33	4,83
lecturers	0,9	0	-
assistants	1	2	2
Ph.D. students total	50	50	49
regular	25	19	13
regular, the third level studies	12	17	26
part-time	13	14	10
technical and administrative staff total	24,50	23	20
R&D associates	13,5	12	9
administrative associates	9	9	9
service workers	2	2	2
space total	2549,1	2549,1	2549,1
laboratories	1172,8	1172,8	1172,8
library	71,2	71,2	71,2
offices of academic staff	1305,6	1305,6	1305,6
computers	334	397	440
library resources			
books (number of volumes)	14103	14302	14543
books (number of titles)	7765	7894	8012
journals (number of titles subscribed to)	125	125	125
teaching activities			
basic courses	27	26	28
advanced courses	51	47	49
other courses	51	70	58
international projects	1	1	1
research projects total	46	53	40
granted by the University	22	24	16
granted by the State institutions	10	14	15
other projects	14	15	9
titles and degrees awarded			
Prof. titles	1	2	1
Ph.D. degrees	1	5	5
M.Sc. degrees	65	72	83
B.Sc. degrees	52+24	56+77	53+29
B.Sc. degrees (English-medium-studies)			5
publications total	164	146	134
sci.-tech. books and chapters in books	3	4	2
sci.-tech. papers in journals	22	41	18
sci.-tech. papers in conference proceedings	122	83	105
textbooks	1	1	-
other publications	16	17	9
research reports	48	44	38
patents granted	0	0	0
conferences			
number of conferences attended by the staff	41	34	40
number of participants from the Institute	140	88	92