INSTITUTE OF RADIOELECTRONICS

WARSAW UNIVERSITY OF TECHNOLOGY

FACULTY OF ELECTRONICS AND INFORMATION TECHNOLOGY

ANNUAL REPORT

2011

Warsaw, February 2012

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From the Director

Welcome to the 2011 edition of our Annual Report!

One more year of the activity of our Institute came to an end. All our actions and projects undertaken in the area of both, teaching and R&D reflected similar trends and results achieved in the past years. It was a creative continuation of development of three main area: radiocommunications, multimedia techniques and biomedical engineering.

Particular spotlight and significance should be given to new investements in our infrastructure. The construction of *Sub-terahertz Technology and Antenna Laboratory* within the framework of the Operational Program Innovative Economy POIG FOTEH (*Photonics and Terahertz Technologies – Development of Faculty Research Center*) was successfully completed. In 2011, we also concluded the financial investment from the Polish Science and Technology Fund - *Laboratory of Hyperpolarized Contrast for MRI*. Several investments in instrumentation within the POIG CePT (*Centre for Preclinical Research and Technology*) were also successfully continued in our Institute last year. The UE Specific Targeted Project PROTEUS (*Integrated Mobile System for Counterrorism and Rescue Operations*), as well as the UE Integrated Project INTechFun (*Innovative Technologies of Multi–functional Materials and Structures for Nanoelectronics, Photonics, Spinotronics and Sensors*) also found their continuation in 2011. For the few recent years, Institute of Radioelectronics had been developing a valuable and interesting international collaboration with CERN (*COMPASS Experiment*) and with Japan (*T2K Experiment*). A new and noteworthy form of European cooperation was undertaken by the Institute last year, which was the participation in the ENIAC JU HEECS project.

The year 2011 abounded greatly in events and memorable moments which involved our senior and junior Staff. We happily celebrated the 90th birthday of Professor *Stefan Hahn* -– an outstanding expert and scholar in the area of radiocommunications, long-term member of the Polish Academy of Sciences and perennial Chairman of the URSI National Committee (URSI - International Union of Radio Science). The members and friends of the Institute were also celebrating the 80th anniversary of Professor's *Jan Ebert's* birthday. Professor is a many years' member of the Central Commission of Titles and Degrees, a former Dean of the Faculty of Electronics and Information Technology of WUT and the past Director of the Institute of Radioelectronics. Professor *Wojciech Gwarek* received a prestigious IEEE Pioneer Award in the area of electromagnetic simulators. Reader *Marek Rusin*, a perennial Vice-minister of the Ministry of Posts and Telecommunications was awarded the Officer's Cross of the Order of Rebirth of Poland. Professor *Wiesław Winiecki* received the title of the professor of technical sciences. Particularly distinctive event in the 2011 history of our Institute was the honoring of Professor *Józef Modelski*, Director of the Institute, with the title of doctor honoris causa of the Military University of Technology (WAT).

Number of distinctions also went to the junior staff of our Institute. Particularly valuable is the awarding of a special research grant within the LIDER programme to *Grzegorz Pastuszak*, Ph.D. by the National Centre of Research and Development (NCBiR). We were also very happy with the success of *Marek Bury*, Ph.D., who scored high in the Ministry of Science and Higher Education competition TOP 500 INNOVATIONS, and in result was given an opportunity to participate in the internship-training programme at Stanford University in the USA. It was also to our great satisfaction having *Piotr Bilski*, Ph.D. been given the prize of POLITYKA weekly magazine, which is awarded annually to outstanding young scholars in the field of technical sciences.

I would like to sincerely thank all the co-workers of the Institute for their deep involvement, hard work and dedicated service. I would also like to express my gratitude to our Grantors, Sponsors as well as all the Co-operators and Friends of the Institute, without whom we would have not been able to achieve our aims. On the one hand, Polish science is suffering from chronic underfunding and on the other, one can observe an insufficient movement in the Polish industry. But despite the difficult situation and unfavourable conditions, it was the good will of all those people who still have confidence in the development of Polish science, that made our goals more easily attainable.

Warsaw, February 2012

Professor Józef Modelski

Classification of publications presented in this Report
is in accordance with the rules in force in 2010

Contents

1. GENERAL INFORMATION

1.1. Mission of the Institute

In defining its mission, the Institute of Radioelectronics is amenable to contemporary needs of academia, industry, and society. Therefore, it aims at the three measurable objectives: to provide teaching of societal relevance; to seek excellence in scientific research; and to run projects meeting the international standards. Technically, we focus on the three well-defined specializations: radiocommunications, multimedia, and biomedical engineering. These are very well perceived by our students and partners in national and international activities.

As educators, our staff performs sterling work and exhibit immense stamina. The effects are directly measurable in terms of quality and numbers of supervised diplomas. 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. We reach further into these sectors through the successful scheme of continuing education. The offer of courses including Radiocommunications and Multimedia Technologies attracts an increasing number of participants.

As researchers, we are faithful to the highest standards of the Faculty and the University. We also feel quite unique due to an extremely broad spectrum of addressed subjects, which comprise:

- 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,
- radio transmitting and receiving,
- radiocommunication terrestrial and satellite systems,
- 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.

It is also our ambition to implement the new scientific knowledge into a good engineering practice. 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, radio-monitoring 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, medicine, and food industry.

The Foundation for Development of Radiocommunications and Multimedia Technologies plays a special role in perpetuating scientific research within our Institute and the whole Faculty. The Foundation subsidizes undergraduate and graduate scholarships. It monitors and awards the progress of young Polish researchers. Its generous support helps us face the socio-economical obstacles, and compete with commercial opportunities awaiting the young people on the open market

1.2. Board of Directors

Director of the Institute:

Józef Modelski, Prof. D.Sc., Tenured Professor
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e-mail: J.Modelski @ire.pw.edu.pl

Secretariat:

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Deputy Director for Research

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1.3. Organisation of the Institute

The Institute of Radioelectronics consists of the following research and teaching divisions:

- Electroacoustics Division;
- Microwave and Radiolocation Engineering Division;
- Nuclear and Medical Electronics Division;
- Radiocommunications Division;
- Television Division.

The structure of the Institute includes Library, Financial Section, Supply Section.

1.3.1. Electroacoustics Division

Head of Division:

Zbigniew Kulka, D.Sc., Professor
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Senior academic staff:

Wiesław Winiecki, Prof. D.Sc., Professor

Jan Żera, D.Sc. (0.5 Assist. Prof. till Sept., Professor from Oct. 2011)

Piotr Bilski, Ph.D., Assistant Professor (0.5)

Piotr Bobiński, Ph.D., Assistant Professor

Ewa Kotarbińska, Ph.D., Assistant Professor (0.5)

Robert Łukaszewski, Ph.D., Assistant Professor

Krzysztof Mroczek, Ph.D., Assistant Professor

Maria Tajchert, Ph.D. Assistant Professor (0.75)

Junior academic staff

Marcin Lewandowski, M.Sc. Assistant (0.75)

Technical staff

Andrzej Leszczyński, Ph.D., Senior R&D Eng. (0.5)

Piotr Nykiel, M.Sc., Senior Development Engineer

Ph.D. Students

Paweł Czernik, M.Sc., from Oct. 2008

Rafał Korycki, M.Sc., from Feb. 2007

Marcin Lewandowski, M.Sc., from Feb. 2008

Jakub Olszyna, M.Sc., from Feb. 2008

Aneta Świercz, M.Sc., from Feb. 2008

Piotr Zawistowski, M.Sc., from Oct. 2010

Retired

Andrzej Aronowski

Jerzy Narkiewicz-Jodko, Ph.D.

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

Current research topics include:
- digital audio signal processing;
- low-level acoustic signals measurements and analysis;
- objective and subjective methods of sound quality evaluation;
- detection of auditory warning signals in the presence of industrial noise;
- elaboration of computation methods for acoustic field radiated in free space by surface acoustic sources and their implementation on a PC.

The other field of interest concerns fundamental and applied research associated with metrology, instrumentation and measuring systems. It is focused on design of automated computer-based measuring systems. Current research topics include:
- modern information technologies, e.g. LabVIEW, Java, XML, and modern communication technologies, e.g. the Internet, GSM, Bluetooth, ZigBee in distributed control and measuring systems;
- information security of distributed measuring systems;
- virtual instrumentation, plug-in boards for data acquisition, IEEE-488 equipment;
- modern real-time systems, eg.: cRIO, ETX, RTX.

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

1.3.2. Microwave and Radiolocation Engineering Division

Microwave and Radiolocation Engineering Division

Head of Division

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Senior academic staff

Tadeusz Morawski, Prof. D.Sc., Tenured Professor (0.5)
Stanisław Rosłoniec, Prof. D.Sc., Professor
Małgorzata Celuch, Ph.D., Assistant Professor
Daniel Gryglewski, Ph.D., Assist. Professor from Jun. 2011)
Paweł Kopyt, Ph.D., Assistant Professor
Sebastian Kozłowski, Ph.D., Assistant Professor
Przemysław Miazga, Ph.D., Assistant Professor
Bartłomiej Salski, Ph.D., Research Assist. Prof. (0.4 from Nov. 2011)
Maciej Sypniewski, Ph.D., Assistant Professor
Andrzej Więckowski, Ph.D., Assistant Professor
Wojciech Wojtasiak, Ph.D., Assistant Professor

Technical staff

Krzysztof Robaczyński, M.Sc., Senior R&D Engineer (0.5 till May, 0.6 from June 2011)
Mirosław Lubiejewski, Foreman

Ph.D. students

Łukasz Gotszald, M.Sc., from Oct. 2011
Przemysław Korpas, M.Sc., from Feb. 2010
Marzena Olszewska, M.Sc., from Feb. 2010
Michał Sołtysiak, M.Sc., from Oct. 2007 to Sept. 2011
Michał Żebrowski, M.Sc., from Oct. 2008

The Microwave and Radiolocation Engineering Division conducts scientific and applied research in the area of electromagnetic field theory, microwave theory and techniques, and measurement techniques for very high frequency ranges. This includes the subjects of computer-aided design, data acquisition and data processing. Specific research topics in 2011 included: design of high-frequency systems for radiocommunication and radar applications (oscillators, synthesizers, modulators, amplifiers, transmitter/receiver modules); methods of synthesis and computer-aided design of passive and active microwave circuits (couplers, power combiners and dividers, switches, transistor circuits); analysis and design of multi-element planar in-phase radar antenna arrays intended to work at high power level; numerical electromagnetic compatibility analysis; methods for measurements of electric and magnetic properties of materials at microwave frequencies; development of numerical methods and implementation of computer programs for full-wave analysis and design of two- and three-dimensional microwave circuits (filters, periodic guiding structures, matching circuits, structures incorporating dispersive and anisotropic media, antennae); methods of coupled electromagnetic-thermodynamic simulations, design of microwave heating applicators for material science applications; methods of coupled electromagnetic-optical modeling; radio-frequency identification and wireless sensing; development of multithread and distributed programming techniques, non-linear programming, and artificial intelligence methods for application in automated design of microwave circuits.

1.3.3. Nuclear and Medical Electronics Division

Head of Division

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Senior academic staff

Janusz Marzec, D.Sc., Professor
Piotr Brzeski, Ph.D., Reader
Roman Szabatin, Ph.D., Reader
Piotr Bogorodzki, Ph.D., Assistant Professor
Grzegorz Domański, Ph.D., Assistant Professor
Marian Kazubek, Ph.D., Assistant Professor (0.5 till Jun. 2011)
Bogumił Konarzewski, Ph.D., Assistant Professor
Robert Kurjata, Ph.D., Assistant Professor
Ewa Piątkowska-Janko, Ph.D., Assistant Professor
Dariusz Radomski, Ph.D., Research Assistant Professor
Tymon Rubel, Ph.D., Assistant Professor
Błażej Sawionek, Ph.D., Assistant Professor (0.5 from Aug. 2011), Senior R&D Eng. (0.5 from Aug. 2011)
Waldemar Smolik, Ph.D., Assistant Professor
Tomasz Jamrógiewicz, M.Sc., Senior Lecturer
Tomasz Olszewski, M.Sc., Senior Lecturer

Junior academic staff

Marcin Ziembicki, M.Sc., Assistant (0.5)

Technical staff

Andrzej Wasilewski, Worker (1 till Jul., 0.75 from Aug. 2011)
Joanna Witkowska, Specialist

Ph.D. students

Stanisław Adaszewski, M.Sc., from Feb. 2009
Piotr Andrzejewski, M.Sc., from Oct. 2011
Wojciech Gradkowski, M.Sc., from Oct. 2010
Łukasz Kołaszewski, M.Sc., from Feb. 2009
Wojciech Obrębski, M.Sc., from Oct. 2008
Piotr Płoński, M.Sc., from Oct. 2010
Andrzej Rychter, M.Sc., from Oct. 2011
Konrad Werys, M.Sc., from Feb. 2011

Retired:

Zdzisław Pawłowski, Prof. D.Sc.

The research and teaching activities carried out in the Nuclear and Medical Electronics Division are concentrated on two areas: biomedical engineering and nuclear electronics. Research in the interdisciplinary area of biomedical engineering covers a broad range of topics and integrates sophisticated electronics and information technology with elements of medical knowledge. The activity in the area of nuclear engineering is concentrated on the design of electronics systems and data processing software for high energy physics experiments. The Division's research is focused on the following topics:

- nuclear medicine (emission tomography: SPECT, PET);
- magnetic resonance imaging (MRI), functional MRI, advanced applications of MRI;
- optical tomography;
- quantitative computer-aided tomography;

- tomographic dynamic studies;
- process tomography, impedance tomography;
- analogue and digital radiography;
- medical image processing and recognition;
- methods and instrumentation for electrocardiography;
- medical applications of isotope techniques;
- telemedicine;
- design of apparatus and software for high energy physics experiments;
- data analysis in genetics and proteomics;
- mathematical modeling of physiological and disease processes.

Areas of recent studies include:
- advanced applications of MRI and CT imaging systems, covering: dynamic scanning protocols, a new methodology and instrumentation for functional MRI, fMRI image analysis methods;
- a new contrast media for MRI: functional lung imaging with hyper-polarized He3, Xe129;
- multi-modal imaging of topographic, tomographic and functional studies in medicine;
- electrical instability of heart study research, high resolution ECG systems;
- digital structural radiography, modeling of radiographic imaging systems;
- optical tomography applications in medicine;
- algorithms for image reconstruction for electrical and process tomography;
- construction of capacitance tomographs and sensors for medical and industrial applications;
- study of a bioelectrical activity of a pregnant uterus and using EHG for telemetric monitoring of upcoming labor;
- application of nonlinear predictive algorithms to control of insulin dosing in diabetic patients;
- algorithms for the data analysis in genomics and proteomics;
- development of detectors, front-end electronics, and test devices for high energy physics experiments;
- applications of "soft-computing" methods (neural networks, evolutionary algorithms, etc.) for data processing and analysis in high energy physics experiments.

1.3.4 Radiocommunications Division

Head of Division

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Senior academic staff

Józef Modelski, Prof. D.Sc., Tenured Professor

Jacek Wojciechowski, Prof. D.Sc., Tenured Professor

Jacek Cichocki, Ph.D., Reader

Tomasz Kosiło, Ph.D., Reader

Tomasz Buczkowski, Ph.D., Assistant Professor

Marek Bury, Ph.D., Assistant Professor

Krzysztof Czerwiński, Ph.D., Assistant Professor (0.5)

Krzysztof Derzakowski, Ph.D., Assistant Professor

Wojciech Kazubski, Ph.D., Assistant Professor

Tomasz Keller, Ph.D., Assistant Professor

Jerzy Kołakowski, Ph.D., Assistant Professor

Sebastian Kozłowski, Ph.D., Assistant Professor (from Jun. 2011)

Krzysztof Kurek, Ph.D., Assistant Professor

Ryszard Michnowski, Ph.D., Assistant Professor

Mirosław Mikołajewski, Ph.D., Assistant Professor

Juliusz Modzelewski, Ph.D., Assistant Professor

Karol Radecki, Ph.D., Assistant Professor

Kajetana Snopek, Ph.D., Assistant Professor

Henryk Chaciński, M.Sc., Senior Lecturer

Research staff of the EU Specific Targeted Research Project *PROTEUS*

Sebastian Kozłowski, M.Sc., Research Assistant (0.95 from Mar. 2010 till Jun. 2011)

Marcin Piasecki, Ph.D., Research Assistant Prof. (0.95 from Jul. 2009 till Dec. 2011)

Paweł Bajurko, M.Sc., Research Assistant (0.95 from Apr. 2010 till Jul. 2011)

Technical staff

Anna Czarnecka, M.Sc., Senior Admin. Specialist

Jacek Jarkowski, Ph.D., Senior R&D Engineer (0.25)

Marek Marcinkowski, Senior Foreman (1 till Aug., 0.75 from Sept. 2011)

Stanisław Żmudzin, M.Sc., Senior R&D Engineer (0.25)

Ph.D. students

Adrian Bilski, M.Sc., from Feb. 2011

Konrad Godziszewski, M.Sc., from Feb. 2011

Piotr Grabowski, M.Sc., from Feb. 2011

Cezary Jezierski, M.Sc., from Oct. 2007

Bartosz Majewski, M.Sc., from Oct. 2010

Piotr Makal, M.Sc., from Feb. 2008

Wojciech Pieńkowski, M.Sc., from Oct. 2010

Anna Urzędowska, M.Sc., from Oct. 2010

Retired

Jan Ebert, Prof. D.Sc.

Stefan Hahn, Prof. D.Sc.

Waldemar Kiełek, D.Sc.

The research and teaching activities of the Radiocommunications Division are related to radiocommunication systems and networks including antennas, signal processing and measurement techniques. The research is focused on analog and digital radio transmission. It includes radio system design with advanced CAD software, particularly cellular and short range systems, as well as some aspects of electromagnetic compatibility, numerous measurements issues and deep insight into antenna techniques.
The most important research topics include analysis, development and investigation of:
- radiocommunication systems and networks – cellular networks (3G and beyond 3G), short range systems, ad-hoc networks, satellite systems and broadband access networks, MIMO systems;
- wireless ultra-wideband systems (UWB) – methods and systems for communication and localization, systems for road safety, microwave imaging systems;
- antennas and radio channel – electrodynamic modeling and design of various types of microwave, millimeter, submillimeters wavelengths and terahertz antennas, including electronically controlled and reconfigurable antennas, photonic antennas, integrated antennas; channel modeling and simulation for MIMO, UWB and cellular systems;
- measurements – spectrum monitoring methods and systems; channel and antenna including automatic far and near-field measurements of antennas characteristics in time and frequency domain, antenna and channel pulse response, transfer functions of UWB antennas, transient states in reconfigurable antennas;

- radio frequency circuits and microwave devices – high-efficiency resonant power amplifiers (class D, DE, E, F and G), linear wide-band short-wave amplifiers, high-power amplitude modulators, high--efficiency power supplies, power factor correctors, low-noise amplifiers, microwave filters and phase shifters and their applications in radio transmitters, receivers, and industrial electronics;
- digital radio broadcasting systems – medium- and short-wave DRM transmitters and receivers;
- theory of signals and modulations – multidimensional Hilbert transform and its applications, "time-frequency" transformations for radio-frequency signal processing, applications of "time-frequency" techniques in audio watermarking;
- environmental, biological and social problems – the influence of radiocommunication systems on a human health and environment as well as on electronic equipment, protection zones planning, radio systems for aid and support of disabled persons;
- design of large-scale telecommunication networks, designing of the topology of access and aggregation networks, localization of: Content Delivery Network nodes, gateway nodes in sensor networks. Routing in wireless sensor networks;
- fault diagnosis – detection and localization of faults in analog systems of different physical nature, e.g. electronic, mechanical;
- data exploration – large data basis is searched with the aid of graph models. Classification of graphs can be done on the basis of the graph structural patterns, e.g. contrast subgraphs and common subgraphs, Coulomb excitation data analysis – analysis of the data from nuclear physics experiments to approximate the shape of nuclei.

1.3.5. Television Division

Head of Division

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Senior academic staff

Roman Z. Morawski, Prof. D.Sc., Professor

Artur Przelaskowski, D.Sc., Professor

Andrzej Buchowicz, Ph.D., Assistant Professor

Grzegorz Galiński, Ph.D., Assistant Professor

Krystian Ignasiak, Ph.D., Assistant Professor

Andrzej Miękina, Ph.D., Assistant Professor

Jacek Naruniec, Ph.D., Assist. Professor (from Jan. 2011)

Grzegorz Pastuszak, Ph.D., Assistant Professor

Andrzej Podgórski, Ph.D., Assistant Professor

Marek Rusin, Ph.D., Reader, (0.33 till Aug., 0.25 from Sept. 2011)

Tomasz Krzymień, M.Sc., Senior Lecturer

Junior academic staff

Rafał Jóźwiak, M.Sc., Assistant (0.75 till Mar., 0.9 from Apr. 2011)

Research staff of the EU Specific Targeted Research Project *PROTEUS*

Andrzej Abramowski, M.Sc., Research Assistant (0.95 from Jan. 2010 till Dec. 2011)

Grzegorz Brzuchalski, M.Sc., Research Assistant (0.95 from Jul. 2009 till Dec. 2011)

Mikołaj Roszkowski, M.Sc., Research Assistant (0.95 from Jan. 2010 till Dec. 2011)

Radosław Sikora, Ph.D., Research Assist. Prof. (0.95 from Jul. 2009 till Jul. 2011)

Michał Wieczorek, Resear. Assistant (0.95 from Jul. 2010 till Dec. 2011)

Technical staff

Tomasz Smakuszewski, M.Sc., R&D Eng. (0.5 till Apr., 0.35 from May 2011)

Ph.D. students

Andrzej Abramowski, M.Sc, from Feb. 2011

Grzegorz Brzuchalski, M.Sc., from Feb. 2011

Mariusz Jakubowski, M.Sc., from Oct. 2008

Magdalena Jasionowska, M.Sc., from Oct. 2009

Marcin Jędryka, M.Sc., from Feb. 2007

Grzegorz Ostrek, M.Sc., from Oct. 2008

Mikołaj Roszkowski, M.Sc., from Oct. 2010

Aleksandra Rutczyńska, M.Sc., from Oct. 2009

Michał Wieczorek, M.Sc., form Oct. 2010

Television Division conducts scientific and applied research in multimedia technologies. The Division is also experienced in multimedia standards and platforms with a special emphasis on tools for collaborative e-learning using media streaming and searching techniques. Recently, important topic of the research is implementation of standard multimedia algorithms in heterogeneous architectures. The Division continues its efforts in the development of MPEG-4 and MPEG 7. The staff actively works in Multimedia Technical Committee no. 288 at Polish National Committee for Standardization (hosted at the Institute of Radioelectronics).
Specific research topics include:
- video and audio compression;
- multicamera systems and 3D modeling;
- image semantic analysis;
- indexing and searching;
- intelligent multimedia systems.

Telemedicine Group extends the area of multimedia applications to teleradiology, e-health and computer--aided diagnosis systems. Fundamentals of medical imaging, image analysis and processing, soft computing for decision support, information theory and codes are used for the following research topics:
- image-based teleconsultations and telediagnosis;
- computer-assisted diagnosis for mammography, chest radiography;
- brain imaging and computer assistance of stroke diagnosis;
- computer assistance of abdominal CT examinations;
- ultrasound imaging and 3D visualization systems;
- medical information systems (HIS/RIS/PACS);
- medical image and data codecs;
- sparse data representation and compressive sensing for disease extraction.

Digital Processing of Measurement Signals Group is active in the field of measurement science and technol--ogy. Its research activities are focused on improving the quality of measurements by means of digital signal processing. The current research topics include:
- general-purpose algorithms for reconstruction of measurands and for calibration of measuring channels;
- spectrophotometric analyzers of food;
- portable sound-and-vibration analyzers for applications in technical diagnostics and in the environmental monitoring;
- ethical aspects of measurement-based empirical research.

1.4. Evening Studies and Continuing Education

1.4.1. M.Sc. Evening Studies on Radiocommunications and Multimedia Technologies

Head

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1.4.2. Engineer Degree Evening Studies on Radiocommunications and Multimedia Technologies

Head

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1.4.3. Postgraduate Studies on Radiocommunication Systems and Multimedia Technologies STRIM

Head

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Secretariat

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Program Board

Józef Modelski, Prof. D.Sc. (chairman),
Andrzej Buchowicz, Ph.D.,
Jacek Cichocki, Ph.D.,
Andrzej Dąbrowski, Prof. D.Sc.

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

Head

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[Edu11], [Edu12], [Edu24], [Edu25], [Edu26], [Edu78], [Edu89], [Edu108], [Edu109], [Edu118]; [Pro25]; [MSc13]; [BSc3].

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[Edu33], [Edu71]; [Pro4], [Pro24]; [Pub10], [Pub95], [Pub101], [Pub112], [Pub138], [Pub139], [Pub140], [Pub141], [Pub147], [Pub148], [Pub149], [Pub150], [Pub163].

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[Edu32], [Edu49], [Edu80]; [Pro3], [Pro4], [Pro9], [Pro24]; [MSc27]; [Pub22], [Pub49], [Pub50], [Pub100], [Pub101], [Pub108], [Pub110], [Pub131], [Pub141], [Pub142], [Pat3].

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M.Sc. (electronics '63), M.Sc. (mathematics '66), Ph.D. ('70), D.Sc. ('73), Prof. Title ('80); microwave technique; **Tenured Professor**, Microwave and Radiolocation Engineering Division.

Member of the Technical Program Committee of MIKON ('80-'09); Member of the Faculty Council Committee on Academic Staff Development ('05-'10); Member of the Committee on Electronics and Telecommunications KEiT, Polish Academy of Sciences PAN ('90-'11); Member of the Microwave Section of KEiT ('96-); Senior Member of IEEE ('80-), Award of the Rector ('10).
[Edu26], [Edu32], [Edu100]; [Pro24].

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M.Sc. ('95), Ph.D. ('02); measurement and instrumentation, programmable logic devices, system-on-a-programmable-chip (SoPC); **Assistant Professor**, Electroacoustics Division.
[Edu6], [Edu27]; [Pro23]; [BSc87]; [Pub54], [Pub91], [Pub121].

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M.Sc. ('06), Ph.D. ('10); multimedia systems, video processing; **Assistant Professor**, Television Division.
[Pro1], [Pro34]; [Pub3], [Pub64].

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M.Sc. ('82); nuclear and medical electronics, capacitance tomography, digital electronics, programmable logic devices; **Senior Lecturer**, Nuclear and Medical Electronics Division.
Member of the Technical Committee for Standardization TC 302 – Using Informatics in the Health Protection ('07-).
[Edu27], [Edu38]; [Pro25].

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M.Sc. ('01), Ph.D. ('06); integrated circuit design, multimedia systems, video processing; **Assistant Professor**, scholarship for the outstanding young scientist granted by MSHE ('10); Television Division.
[Pro1], [Pro7], [Pro34]; [BSc58]; [Pub28], [Pub33], [Pub72], [Pub73], [Pub79].

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Tutorial assistance of Biomedical and Nuclear Engineering Students Scientific Group ('06-), and Beskid Mountain Guides Student Circle (-99'); qualification levels PRINCE2 Foundation ('09-).
[Edu38]; [Pro11], [Pro25], [Pro36]; [MSc1], [MSc44]; [BSc31], [BSc34], [BSc37], [BSc78]; [Pub62].

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[Edu14], [Edu36], [Edu44], [Edu45]; [Pro13], [Pro33]; [Pub59].

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M.Sc. ('90), Ph.D. ('95), D.Sc. ('04); computer-aided diagnosis in medicine, telemedicine, multimedia techniques, signal & image processing, data compression, imaging informatics; **Professor**, Television Division.
Member of Advisory Board of *Machine Graphics & Vision* ('10-); Member of the Program Committee of the Int. Conf. Information Technologies in Biomedicine ITiB (07-) and Int. Conf. Computer Vision and Graphics ('10-); Member of the Scientific Committee of the National Symposium on Biomedical Engineering and Telemedicine IBITEL ('06-);Tutorial assistance of Technique in Medicine Student Scientific Group ('08-).
[Edu9], [Edu18], [Edu73], [Edu76]; [Pro19], [Pro30]; [PhD3]; [MSc59], [MSc60], [BSc32], [BSc41], [BSc71]; [Pub42], [Pub44], [Pub89], [Pub155], [Pub162].

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[Edu102], [Edu113], [Edu121]; [Pro28]; [MSc41]; [BSc12], [BSc43]; [Pub68].

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[Pro12], [Pro14], [Pro25]; [Pub4], [Pub5], [Pub20], [Pub67], [Pub145].

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[Pro24]; [MSc11], [MSc30]; [BSc81], [Pub69], [Pub136].

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[Edu84], [Edu103]; [MSc7]; [Pub13], [Pub19], [Pub165].

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[Edu16], [Edu57], [Edu64].

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[Pro1], [Pro25].

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[Edu67], [Edu68], [Edu83]; [Pro34], [Pro39]; [BSc13], [BSc38].

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[Edu46], [Edu50], [Edu72]; [Pro12], [Pro25]; [MSc18]; [Pub104], [Pub143], [Pub144], [Pub145], [Pub157].

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[Edu58], [Edu59], [Edu113], [Edu119]; [Pro31], [Pro32]; [BSc5]; [Pub40], [Pub75], [Pub76], [Pub146].

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[Edu46], [Edu48]; [Pro24]; [BSc39], [BSc69]; [Pub95], [Pub107], [Pub137].

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[Edu38], [Edu43], [Edu88]; [Pro25]; [MSc2], [MSc31]; [BSc42]; [Pub143], [Pub144].

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[Edu1], [Edu123], [Edu136], [Edu137]; [Pro22]; [MSc4], [MSc40], [MSc51]; [BSc72], [BSc73], [BSc80].

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[Edu48]; [Pro4], [Pro24].

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[Edu2], [Edu37], [Edu60], [Edu79], [Edu97]; [Pro23]; [Prof1]; [BSc15], [BSc27], [BSc68], [BSc98]; [Pub11], [Pub23], [Pub88], [Pub92], [Pub96], [Pub132], [Pub133], [Pub156].

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Member of the Circuit Theory and Signal Processing Section of the Electronics and Telecommunication Committee of the Polish Academy of Sciences ('97-); Member of the Scientific Committees of: International Conference on Signals and Electronics Systems ('97-), Conference on Evolutionary Algorithms and Global Optimization ('97-); Coordinator of the cooperation agreement between WUT and University of Waterloo, Canada ('93-); Adviser to Wydawnictwo Komunikacji i Łączności – a publishing house in engineering ('97-); Associate Editor of *Journal of the Franklin Institute* ('07-); Team I^{o} award of the Rector ('11).
[Edu23], [Edu59], [Edu82]; [Pro32]; [MSc58]; [Pub9], [Pub134].

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[Edu39]; [Pro10], [Pro24]; [MSc48]; [BSc63];
[Pub49], [Pub50], [Pub70], [Pub80], [Pub108].

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M.Sc. ('79), Ph.D. ('86), D.Sc. ('06); antennae and antenna array; **Professor**, Radiocommunications Division, Head ('09-).
Member of the Organizing Committee of the International Conference TCSET ('98-); Reviewer of the *IEEE Transactions on MTT* ('04-), *IEEE Transactions on AP* ('06-) and *IEEE Microwave and Wireless Components Letters* ('04-); Member of Editorial Board of Izwestiya Wuzow Radioelektronika ('09-); Member of the Microwave and Radiolocation Section of the Electronics and Telecommunication Committee of the Polish Academy of Sciences ('07-); TPC Member of the MIKON ('09-), TPC Member of the European Wireless Conference EW ('10-), Member of the Scientific and Programme Committee of the National Conference KKRRiT ('09-).
[Edu4], [Edu69]; [Pro1], [Pro2], [Pro15], [Pro16], [Pro27], [Pro35]; [MSc35], [MSc55]; [BSc10]; [BSc21], [BSc89], [Pub30], [Pub65], [Pub77], [Pub94], [Pub154], [Pub158].

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Member of CERN ('89-); Head of the Warsaw Branch of Polish Society of Medical Physics ('01-); Head of the Dean's Financial Committee ('02-); Member of the Faculty Accreditation Board ('07-); Member of the University Council Committee on Property and Finances ('05-); Member of the Board and Treasurer of the Polish Society of Medical Physics ('05-'11); Member of the Scientific Board of the PhD Students and Young Scientists Conference *Young scientists towards the challenges of modern technology* ('08-); Member of the Scientific Board of Inter. Forum on Innovative Technologies for Medicine ITMED ('07-), Chair ('10-'11); Member of the Scientific Committee of the Symposium *New Trends in Audio and Video* ('08-); Member of the Editorial Advisory Board of the *Polish Journal of Medical Physics and Engineering* ('07-), Head of the Area of Concentration Electronics and Information Technology in Medicine ('06-); Deputy Chairman of the Board of the Center for Imaging and Biomedical Research ('06-); Member of the Biomedical Engineering Commission of the Committee on Medical Physics, Radiobiology and Image Diagnostics PAN ('08-'11); Member of the Board of Polish Eastern Medical Cluster ('08-), Member of the Coordinating Committee ('10-); Faculty Coordinator of Faculty Development ('08-); Faculty Coordinator of Area of Studies Biomedical Engineering ('08-); University Coordinator of Area of Studies Biomedical Engineering ('09-); Member of the Programme Committee of the 3rd International Conference "Computers in Biomedicine 2012"; Member od the Scientific Committee of the workshop: "Ubiquitous Home Healthcare - UHH", in frames of the Federated Conference on Computer Science and Information Systems (2011).
[Edu55], [Edu86], [Edu89]; [Pro5], [Pro6], [Pro21], [Pro25]; [PhD4]; [MSc3], [MSc53]; [BSc93]; [Pub7], [Pub8], [Pub24], [Pub26], [Pub87].

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M.Sc. ('76), Ph.D. ('90), D.Sc. ('04); acoustics, electroacoustics, psychoacoustics, noise control; **Professor**, Electroacoustics Division.
Member of the ISO Working Group – ISO/TC 159/S.C5/WG3 ('97-); Member of Polish Acoustical Society ('78-), European Acoustics Association ('01-), Acoustical Society of America ('90-); Member of the Committee on Acoustics, the Polish Academy of Sciences ('07-); Member of Scientific Council of the Central Institute for Labour Protection – National Research Institute ('09-), Member of Technical Committee KT 105: Electroacoustics of Polish Committee for Standarization ('09-); Individual II^{o} award of the Rector ('11).
[Edu8], [Edu41], [Edu139]; [Pro20], [Pro22]; [PhD2]; [MSc15], [MSc45]; [BSc59], [BSc66]; [Pub12], [Pub113], [Pub114], [Pub127], [Pub152].

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Ph.D. Student	**(tutor)**
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Stanisław Adaszewski, M.Sc.	*(K. Zaremba)*
Piotr Andrzejewski, M.Sc.	*(K. Zaremba)*
Adrian Bilski, M.Sc. *	*(J. Wojciechowski)*
Grzegorz Brzuchalski, M.Sc.	*(W. Skarbek)*
Paweł Czernik, M.Sc.	*(W. Winiecki)*
Konrad Godziszewski, M.Sc.	*(Y. Yashchyshyn)*
Łukasz Gotszald, M.Sc.	*(W. Gwarek)*
Piotr Grabowski, M.Sc.*	*(J. Wojciechowski)*
Wojciech Gradkowski, M.Sc.	*(J. Marzec)*

Mariusz Jakubowski, M.Sc.*	*(W. Skarbek)*
Magdalena Jasionowska, M.Sc.	*(A. Przelaskowski)*
Cezary Jezierski, M.Sc.*	*(J. Modelski)*
Marcin Jędryka, M.Sc.*	*(W. Skarbek)*
Łukasz Kołaszewski, M.Sc.	*(K. Zaremba)*
Przemysław Korpas, M.Sc.	*(W. Gwarek)*
Rafał Korycki, M.Sc.*	*(Z. Kulka)*
Marcin Lewandowski, M.Sc.	*(Z. Kulka)*
Bartosz Majewski, M.Sc,*	*(Y. Yashchyshyn)*
Piotr Makal, M.Sc.	*(J. Modelski)*
Wojciech Obrębski, M.Sc.	*(K. Zaremba)*
Marzena Olszewska, M.Sc.	*(W. Gwarek)*
Jakub Olszyna, M.Sc.	(*W. Winiecki)*
Grzegorz Ostrek, M.Sc.	*(A. Przelaskowski)*
Wojciech Pieńkowski, M.Sc.*	*(J. Modelski)*
Piotr Płoński, M.Sc.	(*K. Zaremba)*
Mikołaj Roszkowski, M.Sc.*	*(W. Skarbek)*
Aleksandra Rutczyńska, M.Sc.	*(A. Przelaskowski)*
Andrzej Rychter, M.Sc.	*(J. Marzec)*
Michał Sołtysiak, M.Sc. *	*(W. Gwarek)*
Aneta Świercz, M.Sc.*	*(J. Żera)*
Anna Urzędowska, M.Sc.	*(Y. Yashchyshyn)*
Konrad Werys, M.Sc.*	*(J. Marzec)*
Michał Wieczorek, M.Sc.*	*(W. Skarbek)*
Piotr Zawistowski, M.Sc.	*(W. Winiecki)*
Michał Żebrowski, M.Sc.*	*(S. Rosłoniec)*

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3. TEACHING ACTIVITIES

(the spring semester of the academic year 2010/2011 and the fall semester of the academic year 2011/2012)

3.1. Regular studies –Areas of Focus:

Radiocommunications and Multimedia Technologies

Head

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1. **Electronics and Information Technology in Medicine**
2. **Biomedical Engineering**

Head

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3.1.1. Basic courses

[Edu1] *Acoustics in Architecture* (Akustyka w architekturze – AK); 15h/sem.; M. Tajchert.

[Edu2] *Acquisition and Data Processing Using LabVIEW* (Akwizycja i przetwarzanie danych z wykorzystaniem LabVIEW – LABV); 30h/sem.; W. Winiecki.

[Edu3] *Analysis of Measurement Data in Medicine* (Analiza danych pomiarowych w medycynie – ADP); 45h/sem.; B. Konarzewski.

[Edu4] *Antennae and Radiowave Propagation* (Anteny i propagacja fal – AIPF); 45h/sem.; Y. Yashchyshyn.

[Edu5] *Basic Radio-frequency Circuits* (Podstawowe układy radioelektroniczne – PURAD); 45h/sem.; J. Modzelewski, W. Kazubski.

[Edu6] *Basics of Digital Technique* (Podstawy techniki cyfrowej – PTCY); 45h/sem.; L. Raczyński, K. Mroczek.

[Edu7] *Basics of Electroacoustic Techniques* (Podstawy elektroakustyki – PTD); 45h/sem.; P. Bobiński.

[Edu8] *Basics of Hearing and Sound Perception* (Podstawy słyszenia i percepcja dźwięku – PSPD); 30h/sem.; J. Żera.

[Edu9] *Basics of Image Diagnostics Engineering* (Podstawy inżynierii diagnostyki medycznej – PIDOM); 45h/sem.; A. Przelaskowski.

[Edu10] *Basics of Information Techniques* (Podstawy technik Informacyjnych – PTIB); 30h/sem.; R. Kurjata.

[Edu11] *Basics of Medical Imaging* (Podstawy obrazowania medycznego – POMED); 45h/sem.; P. Brzeski.

[Edu12] *Basics of Medical Imaging Techniques* (Podstawy technik obrazowania w medycynie – PTOM); 60h/sem.; P. Brzeski.

[Edu13] *Basics of Microprocessor Technique* (Podstawy techniki mikroprocesorowej – TMIK); 60h/sem.; K. Czerwiński, B. Konarzewski, K. Derzakowski, T. Krzymień.

[Edu14] *Basics of Programming* (Podstawy programowania – PRM); 60h/sem.; A. Podgórski.

[Edu15] *Basics of Radiocommunications* (Podstawy radiokomunikacji – PR); 45h/sem.; T. Kosiło.

[Edu16] *Basics of Image Techniques* (Podstawy techniki obrazowej – PTO); 45h/sem.; G. Galiński, M. Rusin.

[Edu17] *Broadcasting Systems* (Systemy radiofoniczne – SYR); 45h/sem.; H. Chaciński.

[Edu18] *Computer Graphics* (Grafika komputerowa – GRK); 30h/sem.; A. Przelaskowski.

[Edu19] *Construction of High Quality Audio Equipment* (Konstrukcja urządzeń audio wysokiej jakości – KUA); 30h/sem.; P. Nykiel.

[Edu20] *Detection of Nuclear and Biomedical Signals* (Detekcja sygnałów biomedycznych i jądrowych – DSBJ); 60h/sem.; J. Marzec.

[Edu21] *Digital Cellular Systems* (Cyfrowe systemy komórkowe – CSK); 45h/sem.; J. Kołakowski.

[Edu22] *Digital Circuits* – EDC1; 30h/sem.; P. Miazga (English-medium studies).

[Edu23] *Digital Communications* – EDICO; 60h/sem.; J. Wojciechowski (English-medium studies).

[Edu24] *Diploma Seminar for Graduate Students 1* (Seminarium dyplomowe magisterskie 1 – SDM1); 30h/sem.; J. Modelski, P. Brzeski, Z. Kulka.

[Edu25] *Diploma Seminar for Graduate Students 2* (Seminarium dyplomowe magisterskie 2 – SDM2); 30h/sem.; Z. Kulka, J. Modelski, P. Brzeski.

[Edu26] *Diploma Seminar for Undergraduate Students* (Seminarium dyplomowe inżynierskie – SDI); 30h/sem.; P. Brzeski, T. Morawski.

[Edu27] *Digital Systems* (Układy cyfrowe – UCYF); 15h/sem.; K. Mroczek, T. Olszewski.

[Edu28] *Electroacoustics* (Elektroakustyka – EL); 45h/sem., A. Leszczyński.

[Edu29] *Electronic Circuits Supply* (Zasilanie układów elektronicznych - ZUE); 45h/sem.; M. Mikołajewski.

[Edu30] *Event-Driven Programming* (Programowanie zdarzeniowe – PROZE); 45h/sem.; K. Ignasiak.

[Edu31] *Ethical Aspects of Research and Engineering* – EEARE; 30h/sem; R. Z. Morawski (English-medium studies).

[Edu32] *Fields and Waves* (Pola i fale – POFAT); 45h/sem.; T. Morawski, W. Gwarek .

[Edu33] *Fields, Waves and Antennae* – EFWA; 60h/sem.; M. Celuch (English-medium studies).

[Edu34] *Influence of Electromagnetic Waves on Living Organisms* (Oddziaływanie fal elektromagnetycznych na organizmy żywe – OFE); 30h/sem.; K. Derzakowski.

[Edu35] *Information Techniques in Image Medical Diagnostics* (Techniki informacyjne w medycznej diagnostyce obrazowej – TIM); 60h/sem.; P. Bogorodzki.

[Edu36] *Introduction to Numerical Methods* (Wstęp do metod numerycznych – WNUM); 45h/ sem.; R. Z. Morawski, A. Miękina, A. Podgórski.

[Edu37] *Measurement Systems* (Systemy pomiarowe – SPOM); 30h/sem.; W. Winiecki.

[Edu38] *Medical Electronic Instrumentation* (Elektroniczna aparatura medyczna – EAME); 60h/sem.; T. Olszewski, R. Szabatin, T. Jamrógiewicz, E. Piątkowska-Janko.

[Edu39] *Microwave Technique (*Technika mikrofalowa – TMO); 60h/sem.; W. Wojtasiak.

[Edu40] *Multi-service and Multimedia Networks* – EMSMN; 60h/sem.; T. Keller (English--medium studies).

[Edu41] *Music Acoustics* (Akustyka muzyczna – AM); 30h/sem.; J. Żera.

[Edu42] *Noise Control* (Ochrona przed hałasem – OPH); 30h/sem.; E. Kotarbińska.

[Edu43] *Nuclear Medicine Techniques* (Techniki medycyny nuklearnej – TMENU); 30h/ sem.; R. Szabatin.

[Edu44] *Numerical Methods* (Metody numeryczne – MNUB); 45h/sem.; R. Z. Morawski, A. Miękina, A. Podgórski (Biomedical Engineering).

[Edu45] *Numerical Methods* – ENUME; 60h/sem.; R. Z. Morawski, A. Miękina, A. Podgórski (English-medium studies).

[Edu46] *Object-oriented Programming M* (Programowanie obiektowe M – PROE); 60h/sem.; W. Smolik, M. Sypniewski.

[Edu47] *Object-oriented Programming of Multimedia Applications in Java (*Java – obiektowe programowanie aplikacji multimedialnych – OPA); 45h/sem.; K. Ignasiak.

[Edu48] *Operating Systems* (Systemy operacyjne – SOE); 15h/sem.; M. Sypniewski, A. Więckowski.

[Edu49] *Orientation* (Orientacja – ORM); 15h/sem.; W. Gwarek.

[Edu50] *Programming Languages* (Języki programowania - JP); 75h/sem.; W. Smolik.

[Edu51] *Radiocommunication Systems* (Systemy radiokomunikacyjne – SRKO); 45h/sem.; T. Kosiło.

[Edu52] *Radioelectronics Measurements (*Miernictwo radioelektroniczne – MR); 45h/sem.; J. Cichocki.

[Edu53] *Radio Networks and Systems* (Systemy i sieci radiowe – SISR); 45h/sem.; T. Keller.

[Edu54] *Radiological Apparatus in Medical Diagnostics* (Aparatura radiologiczna w diagnostyce medycznej – ARDM); 30h/sem.; G. Domański.

[Edu55] *Radiology and Nucleonics* (Radiologia z nukleoniką – RN); 45h/sem.; K. Zaremba.

[Edu56] *Satellite Communications* (Łączność satelitarna – LS); 45h/sem.; K. Kurek, J. Modelski.

[Edu57] *Selected Problems of Modern Television* (Wybrane zagadnienia współczesnej telewizji – WZWT); 30h/sem.; M. Rusin.

[Edu58] *Signals and Systems* (Sygnały i systemy – SYGSY); 60h/sem.; K. Snopek (Biomedical Engineering).

[Edu59] *Signals, Modulations and Systems (*Sygnały, modulacje i systemy – SYMSE); 60h/sem.; J. Wojciechowski, K. Snopek.

[Edu60] *Software for Measuring Systems* (Oprogramowanie systemów pomiarowych – OSP); 60h/sem.; W. Winiecki, P. Bobiński.

[Edu61] *Software for Medical Systems (*Oprogramowanie systemów medycznych – OSM); 45h/sem.; R. Kurjata.

[Edu62] *Sound Recording Technique* (Dźwiękowa technika studyjna – DTS); 45h/sem.; M. Lewandowski.

[Edu63] *Signal Processors in Audio Techniques* (Procesory sygnałowe w technice audio – PSTA); 45h/sem; P. Bobiński.

[Edu64] *Television Systems* (Systemy telewizyjne – SYTE); 45h/sem.; A. Buchowicz, T. Keller, T. Krzymień, M. Rusin.

[Edu65] *Ultrasonography Instrumentation* (Aparatura ultrasonograficzna – AUS); 45h/sem.; R. Jóźwiak.

[Edu66] *UMTS System (System UMTS – UMTS);* 45h/sem.; J. Kołakowski.

[Edu67] *Visualization and Modeling in Multimedia* (Wizualizacja i modelowanie w multimediach – WIM); 45h/sem.; W. Skarbek.

3.1.2 Advanced courses

[Edu68] *Adaptive Image Recognition* – EADIR; 60h/sem.; W. Skarbek (English-medium studies).

[Edu69] *Antennae Theory and Design* (Teoria i projektowanie anten – TPA); 60h/sem.; Y. Yashchyshyn.

[Edu70] *Biomedical Accelerators* (Akceleratory biomedyczne – ABM); 30h/sem.; S. Wronka.

[Edu71] *Computional Electromagnetics for Telecommunications* – ECOET; 60h/sem.; M. Celuch (English-medium studies).

[Edu72] *Computed Tomography* (Tomografia komputerowa – TOM); 60h/sem.; W. Smolik.

[Edu73] *Computer - Aided Medical Image Diagnostics* (Komputerowe wspomaganie obrazowej diagnostyki medycznej – KWOD); 45h/sem.; A. Przelaskowski.

[Edu74] *Contemporary Heuristic Techniques* – ECOHT; 60h/sem.; P. Bilski (English-medium studies).

[Edu75] *Contemporary Heuristic Techniques* (Współczesne techniki heurystyczne – WMH); 60h/sem.; P. Bilski.

[Edu76] *Data Compression* (Kompresja danych – KODA); 45h/sem.; A. Przelaskowski.

[Edu77] *Digital Audio Signal Processing* (Cyfrowe przetwarzanie sygnałów fonicznych – CPSF); 45h/sem.; Z. Kulka.

[Edu78] *Digital Image Processing* (Cyfrowe przetwarzanie obrazów – CPOO); 30h/sem.; P. Brzeski.

[Edu79] *Distributed Measurement and Control Systems* (Rozproszone systemy pomiarowo-kontrolne – RSPK); 45h/sem.; W. Winiecki, R. Łukaszewski.

[Edu80] *Electromagnetic Compatibility* (Kompatybilność elektromagnetyczna – KE); 30h/sem.; W. Gwarek.

[Edu81] *Evolutionary Algorithms* – EEVAL; 60h/sem.; P. Miazga (English-medium studies).

[Edu82] *Graphs and Networks* (Grafy i sieci – GIS); 30h/sem.; J. Wojciechowski.

[Edu83] *Image and Audio Semantic Analysis (*Analiza semantyczna obrazu i dźwięku – ASOD); 45h/sem; W. Skarbek.

[Edu84] *Large-scale Measurement Methods in Molecular Biology* (Wielkoskalowe metody pomiarowe w biologii molekularnej – MPB); 45h/sem; T. Rubel.

[Edu85] *Magnetic Resonance Imaging* (Tomografia rezonansu magnetycznego – TRM); 45h/sem.; P. Bogorodzki.

[Edu86] *Neural Networks in Biomedical Applications* (Sieci neuronowe w zastosowaniach biomedycznych – SNB); 45h/sem., K. Zaremba.

[Edu87] *Noise and Electromagnetic Interference in Electronics Devices* (Szumy i zakłócenia w aparaturze elektronicznej – SZAE); 30h/sem; J. Marzec.

[Edu88] *Nuclear Medicine Techniques* (Techniki medycyny nuklearnej – TMN); 60h/sem.; R. Szabatin.

[Edu89] *Selected Techniques of Medical Imaging* (Wybrane techniki obrazowania medycznego – PW-S5); 30h/sem.; Ph.D. studies, P. Brzeski, K. Zaremba.

[Edu90] *Telemedical Systems* (Systemy telemedyczne - TELM); 45h/sem., R. Kurjata.

3.2. Special courses

3.2.1 Engineer Degree Evening Studies on Radiocommunications and Multimedia Technologies

[Edu91] *Antennae* (Anteny – ANM); 30h/sem.; semester 4; H. Chaciński.

[Edu92] *Basics of Computer Techniques* (Podstawy techniki komputerowej – PKOM); 45h/sem.; semester 1; R. Kurjata.

[Edu93] *Basics of High-Frequency Techniques* (Podstawy techniki w.cz. – PTWM); 60h/sem.; semester 3; D. Gryglewski.

[Edu94] *Basics of Logical Circuits and Microprocessor Technique* (Układy logiczne i podstawy techniki mikroprocesorowej – PULM); 60h/sem.; semester 4; K. Czerwiński.

[Edu95] *Basics of Satellite Communications* (Podstawy łączności satelitarnej – SATM); 15h/sem.; semester 4; K. Kurek.

[Edu96] *Circuits and Signals* (Obwody i sygnały – OSRM); 45h/sem.; semester 2; M. Dziewiecki.

[Edu97] *Computer Control and Data Processing* (Komputerowe sterowanie i przetwarzanie danych – KSTM); 45h/sem.; semester 5; W. Winiecki.

[Edu98] *Digital Signals Transmission* (Cyfrowa transmisja sygnałów – CTSM); 45h/sem.; semester 5; T. Kosiło.

[Edu99] *Electronic Circuits* (Układy elektroniczne – UEM); 45h/sem.; semester 3; D. Gryglewski.

[Edu100] *Fields and Waves* (Pola i fale – PFM); 60h/sem.; semester 2; T. Morawski.

[Edu101] *Introduction to Programming* (Wstęp do programowania – WPRM); 15h/sem.; semester 2; R. Kurjata.

[Edu102] *Materials and Elements* (Materiały i elementy – MEM); 15h/sem.; semester 4; K. Radecki.

[Edu103] *Multimedia Applications* (Aplikacje multimedialne – AMRM); 15h/sem.; semester 5; T. Rubel.

[Edu104] *Multimedia Computer Systems* (Multimedialne systemy komputerowe – MSKM); 30h/sem.; semester 4; T. Jamrógiewicz.

[Edu105] *Numerical and Statistical Techniques* (Techniki obliczeniowe i symulacyjne – TOSM); 30h/sem.; semester 4; A. Miękina.

[Edu106] *Programmable Digital Devices* (Programowalne układy cyfrowe – PUCM); 30h/sem.; semester 5; M. Ziembicki.

[Edu107] *Programming* (Programowanie – PMRM); 30h/sem.; semester 3; R. Kurjata.

[Edu108] *Project 1* (Projekt 1 – PJUM); 30h/sem.; semester 5; P. Brzeski.

[Edu109] *Project 2* (Projekt 2 – PSRM); 60h/sem.; semester 6; P. Brzeski.

[Edu110] *Propagation of Waves* (Propagacja fal – PFAM); 15h/sem.; semester 4; K. Kurek.

[Edu111] *Radiodiffusion Systems* (Systemy radiodyfuzyjne – SRDM); 60h/sem.; semester 6; A. Buchowicz, H. Chaciński.

[Edu112] *Radioelectronics Measurements* (Miernictwo radioelektroniczne – MRM); 45h/sem.; semester 5; J. Cichocki.

[Edu113] *Signals and Modulations* (Sygnały i modulacje – SMRM); 60h/sem.; semester 3; K. Snopek, K. Radecki.

[Edu114] *Technique of Emission and Receiving* (Technika emisji i odbioru – TEM); 45h/sem.; semester 4; J. Modzelewski, W. Kazubski.

3.2.2 M.Sc. Evening Studies on Radiocommunications and Multimedia Technologies

[Edu115] *Computer Systems* (Systemy komputerowe – SMKW); 30h/sem.; semester 2; T. Jamrógiewicz.

[Edu116] *Designing of Radiocommunication Systems* (Projektowanie systemów radiokomunikacyjnych – PSRW); 60h/sem.; semester 3; T. Kosiło.

[Edu117] *Digital Pogrammable Circuits* (Cyfrowe układy programowalne – CUPW); 45h/sem.; semester 2, P. Kopyt.

[Edu118] *Diploma Seminar* (Seminarium dyplomowe – SDMW); 30h/sem.; semester 4; P. Brzeski.

[Edu119] *Numerical Methods* (Metody numeryczne – MNW); 30h/sem.; semester 2, K. Snopek.

[Edu120] *Programming in Java Language* (Programowanie w języku Java – PJJW); 45h/sem.; semester 1; K. Ignasiak.

[Edu121] *Radio Navigation Systems* (Radiowe systemy nawigacyjne – RSNW); 45h/sem.; semester 4; T. Buczkowski, K. Czerwiński, K. Radecki.

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

[Edu122] *Basics of Radiocommunication Systems* (Podstawy systemów radiokomunikacyjnych); 15h, once a year, T. Kosiło.

3.2.4. Environmental Noise Course

The Environmental Noise Course represents a series of courses; 135h.

[Edu123] *Basics of Acoustics* (Podstawy akustyki); 25h; M. Tajchert, A. Leszczyński.

[Edu124] *Basics of Statistics* (Podstawy statystyki); 10h; M. Kirpluk.

[Edu125] *Environment Noise Prediction* (Prognozowanie emisji hałasu w środowisku); 10h; M. Kirpluk.

[Edu126] *Noise in the Workplace* (Hałas w środowisku pracy); 6h; E. Kotarbińska.

[Edu127] *Legal Environment Noise Regulations* (Regulacje prawne w zakresie ochrony środowiska przed hałasem); 4h; M. Wojciechowska.

[Edu128] *Noise Measuring and Monitoring Methods* (Metody pomiaru i monitorowania hałasu); 16h; M. Kirpluk, J. Maciejczyk, P. Tomczyk.

[Edu129] *Noise Control* (Zabezpieczenia akustyczne); 10h; J. Sikora, G. Makarewicz.

[Edu130] *Human Health Effects of Noise* (Wpływ hałasu na organizm ludzki); 4h; Z. Koszarny.

[Edu131] *Noise Mapping* (Mapy akustyczne); 6h; J. Grabowski.

[Edu132] *Research Laboratories Accreditation* (Akredytacja laboratoriów badawczych); 6h; M. Szeląg.

[Edu133] *Selected Problems in Building Acoustics* (Wybrane zagadnienia z akustyki budowlanej); 16h; M. Niemas.

[Edu134] *Uncertainty of Noise Measurements* (Niepewność pomiarów); 8h; M. Kirpluk.

[Edu135] *Workshop - Noise Measurements* (Warsztaty-pomiary hałasu); 10h; M. Kirpluk, J. Maciejczyk, P. Tomczyk.

3.2.5. B.Sc. Level e-learning Special Courses

Warsaw University of Technology Distant Learning Center – OKNO (Ośrodek Kształcenia na Odległość Politechniki Warszawskiej – OKNO)

[Edu136] *Basics of Sound Technique* (Podstawy techniki dźwiękowej); 30h/sem.; Z. Kulka, A. Leszczyński M. Tajchert.

[Edu137] *Systems and Devices of Sound Technique* (Urządzenia i systemy techniki dźwiękowej); 30h/sem.; Z. Kulka, A. Leszczyński, M. Tajchert.

3.3. International co-operation

[Edu138] SOCRATES Programme: **Higher Education**.
T. Kosiło, Ph.D.
1999-2011

Institute of Radioelectronics of the WUT has a working bilateral SOCRATES agreement with Katholieke Hogeschool Sint-Lieven (KaHo), Gent, Belgium and Instituto Superior Tecnico, Universidade Tecnica de Lisboa, Lisbon, Portugal. Student Mobility Programme.

[Edu139] **Advanced Technology Higher Education Network / Socrates** (**ATHENS**)

Within the Advanced Technology Higher Education Network / Socrates (ATHENS), the following courses were offered:
“Ethical Aspects of Research and Engineering" was given by **R. Z. Morawski** from November 14 to November 18, 2011;
“Sound Hearing and Acoustical Measurements” was given by **J. Żera** from March 12 to 19, 2011;
The students who attended this course were from the following EU institutions of higher education:

- École des Mines de Paris, Paris, France (three persons);
- École Nationale des Ponts et Chaussées, Paris, France (three persons);
- École Nationale Supérieure d'Arts et Métiers, Paris, France (two persons);
- École Nationale Supérieure des Techniques Avancées, Paris, France (three persons);
- École Nationale Supérieure des Télécommunications, Paris, France (two persons);
- Katholieke Universiteit Leuven, Leuven, Belgium(one person);
- Politechnika Warszawska, Warszawa, Poland (one person);
- Politecnico di Milano, Milano, Italy (two persons);
- Technische Universität München, München, Germany (three persons);
- Technische Universität Wien, Wien, Austria (one person);
- Universidad Politécnica de Madrid, Madrid, Spain (one person)

The courses included 20 hours of lectures and 10 hours of class tutorials.

4. RESEARCH PROJECTS

4.1. International projects

4.1.1. European grants

[Pro1] **Integrated Mobile System for Counterterrorism and Rescue Operations** (Zintegrowany mobilny system wspomagający działania antyterrorystyczne i antykryzysowe).
Józef Modelski, Y. Yashchyshyn, M. Bury, K. Derzakowski, T. Keller, K. Kurek, J. Naruniec, G. Pastuszak, M. Piasecki, B. Sawionek, M. Jaworska, A. Abramowski, P. Bajurko, K. Bryłka, G. Brzuchalski, M. Darmento, M. Jakubowski, M. Kalinowska, S. Kozłowski, A. Linkowski, B. Majewski, M. Morgoś, Ł. Mosdorf, M. Mosdorf, A. Mundzik, M. Klocek, A. Kurek, M. Roszkowski, A. Rudziński, R. Sikora, A. Skrzypkowski R. Szumny, M. Wieczorek;
Apr. 1, 2007 – Aug. 31, 2013
PROTEUS, EU Specific Targeted Research Project (Partially funded by MSHE)

The task of PROTEUS is to break a number of the technological barriers and to create a demonstrator of the system, which will offer a new quality of the actions in the critical situations. As a result of the planned project in the years 2009-2013 integrated system will come into being, which will include: unmanned plane to remote monitoring, three robots for various use, mobile command center.

[Pro2] **Photonics and Terahertz Technologies – Development of Department Research Center – Antenna Laboratory Modernization** (Fotonika i Technologie Terahercowe – Rozwój Wydziałowego Centrum Badawczego – Modernizacja laboratorium antenowego).
Yevhen Yashchyshyn, P. Bajurko, M. Bury, A. Skrzypkowski;
Jan. 1, 2010 – Dec. 31, 2011
FOTEH, POIG 2.1, the Innovative Economy Program

Funds from the project are being used to purchase measurement equipment operating in the frequency range up to 0.5 THz as well as to adapt the antenna laboratory room to sub-THz measurements.

[Pro3] **Innovative Technologies of Multi–functional Materials and Structures for Nanoelectronics, Photonics, Spinotronics and Sensors** (Innowacyjne technologie wielofunkcyjnych materiałów i struktur dla nanotechniki, fotoniki, spinotroniki i technik sensorowych).
Wojciech Gwarek;
Feb. 26, 2009 – Dec. 31, 2013
INTechFun, EU Integrated Project

This project is carried out at Institute of Electron Technology, Institute of Physics Polish Academy of Sciences, Silesian University of Technology, Technical University of Lodz, Military University of Technology. The main aim of this project is to integrate different semiconductors and technologies and develop new semiconductor devices based on creative and innovative technological solutions and designs. The project is focused on wide bandgap materials like zinc oxide and related film, gallium nitride and related epitaxial layers, silicon carbide. The functional thin layers for ohmic and rectifying contacts, interconnections, gate dielectrics have been developing based on four material groups: stable thermal oxides, nitrides, carbides and borides.

[Pro4] **High Efficiency Electronics Cooking Systems**
Małgorzata Celuch, A. Więckowski, W. Gwarek, P. Korpas
Mar. 1, 2011 – Feb. 28, 2014
HEECS, ENIAC JU Project

The HEECS project will answer the need to increase energy efficiency, developing a smart, controlled and highly efficient solid state cooking device and give significant contributions to standards. This cooking appliance will represent a breakthrough innovation which currently does not exist on the market. HEECS will deliver a new concept Microwave Oven. The main project scope is to enhance energy efficiency by more than 25% in microwave ovens (MWOs) across any range of food to be heated or cooked at home. According to this scope, breakthrough technologies will be researched and developed according to 4 HEECS main project objectives: 1) New and improved semiconductor technologies mainly focused on innovative high frequency power solid state devices. 2) Improved thermal management systems to efficiently cool the high frequency power transistor package, and make use of the dissipated heat energy in an efficient way. 3) Intelligent electromagnetic (EM) field adjustment and high frequency controls, in order to better distribute the field intensity within differing food types, therebyheating the food appropriately and decreasing losses. 4) Optimized MWO technology configuration and system architecture delivering optimum feeding and efficiency of the MWO through enhanced signal conditioning. Matching the overall ENIAC objectives, all the electronic parts of the solid state cooking device, including small signal board (frequency synthesizer, high speed RF switching, micro controller), Switched mode power supply unit, high frequency power amplification stages, RF sensing and coupling, will be built with miniaturised circuits. The thermal management of the RF power devices will also incorporate thermal / material aspects relevant to ensure reliability and miniaturisation within the hybrid transistor package. The project will also deliver TCAD, and multi-physics tools enabling design of new technologies related to RF Hybrid circuit integration, phased array controls, and thermal design of High Frequency power transistor packages.

4.2 Projects granted by the Ministry of Science and Higher Education (MSHE)

4.2.1. International grants

[Pro5] **The COMPASS Experiment – the Rese--arch on the Spin Structure of Nucleon** (Eksperyment COMPASS – badanie spinowej struktury nukleonu).
Krzysztof Zaremba, J. Marzec, M. Dziewiecki, G. Domański, B. Konarzewski, R. Kurjata, M. Ziembicki;
COMPASS, International project realized in

collaboration with the Soltan Institute for Nuclear Studies and Faculty of Physics, Warsaw University;
Oct. 30, 2007 – Jan. 30, 2011

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 (Geneva). Within the framework of a new program the team from the Institute of Radioelectronics is responsible (together with the teams from Soltan Institute of Nuclear Studies, and Warsaw University) for the design of new methods of the experimental data analysis, including applications of the "soft computing" methods (neural networks, genetic algorithms etc.). The Institute is also involved in preparations of the hardware upgrade of the COMPASS experiment for the new physical program.

[Pro6] **The Research of the Neutrino Oscillations – the Second Generation Experiment – Design of the Detector and Participation in the Data Acquisition in the T2K Experiment** (Badanie oscylacji neutrin – eksperyment drugiej generacji – budowa detektora i udział w pomiarach przeprowadzanych w eksperymencie T2K).
Krzysztof Zaremba, J. Marzec, M. Dziewiecki, G. Domański, B. Konarzewski, R. Kurjata, M. Ziembicki, P. Płoński;
T2K, International project realized in collaboration with the Faculty of Physics, Warsaw University, Andrzej Soltan Institute for Nuclear Studies, Institute of Nuclear Physics, Polish Academy of Sciences, Faculty of Physics and Astronomy, University of Wroclaw, Faculty of Mathematics, Physics and Chemistry, Silesian University;
Oct. 30, 2007 – Dec. 31, 2011

The project is a part of the collaboration with the T2K experiment in Japan. The T2K is a component of the second generation long-baseline neutrino-oscillation experiment intended for studies of the nature of neutrinos and the effect of their oscillations. Artificial neutrino beam generated in the proton accelerator in Tokai is shot toward the 50-kT water Cherenkov detector, Super-Kamiomande, which is located about 1000 m underground in Kamioka mine and is 295 km away from Tokai. The Institute of Radioelectronics takes part in the design of SMRD (Side Muon Range Detector), which is the part of the near detector (ND280), located in Tokai, 280 m away from the target position, intended for measurements of the neutrino spectrum, contamination and interaction cross-sections before the oscillation.

4.2.2. Grants for young researchers

[Pro7] **Hardware Architectures for Real-Time Multi-Source Audiovisual Coding** (Architektury sprzętowe dla wieloźródłowego audiowizualnego kodowania czasu rzeczywistego).
Grzegorz Pastuszak;
Aug. 1, 2011 – Jul. 31, 2014
LIDER Programme

The goal of the project is the design and prototype implementation of real-time audiovisual compression with the support for the multi-view disparity map. The practical effect of the project will be the reference hardware application of the real-time FPGA-based system including multi-channel audio compression, multi-view video compression, and disparity estimation. The digital part of the system will be integrated in one FPGA device. The hardware acceleration and new encoder architectures will allow higher audiovisual compression efficiencies compared to existing solutions. The accurate multi--view disparity estimation will support the video compression and allow the depth maps needed in the 3D reconstruction. Additionally, the multi-channel audio will provide information to identify the localization of objects. Therefore, the implementation of the system will provide tools to build a free-viewpoint system in the future.

[Pro8] **Novel Techniques of Electromagnetic Calorimetry for High Energy Physics** (Nowoczesne techniki kalorymetrii elektromagnetycznej w eksperymentach fizyki wysokich energii).
Marcin Ziembicki;
Jun. 13, 2011 – Jun. 12, 2012
Iuventus Plus Programme

The aim of the project is to investigate photomultiplier rate effects on energy resolution of electromagnetic calorimeters, with particular interest on the electromagnetic calorimeters used in the COMPASS experiment. The result of the work will be a model of the phenomenon, which should allow development of an algirithm that will minimize negative impact of photomultiplier rate-effects, possibily leading to improvement of the energy resolution of electromagnetic calorimeters.

4.2.3. Development grants

[Pro9] **Design and Manufacturing of a sub-THz Radiation Detector based on MOS Transistor** (Zaprojektowanie i wykonanie detektora promieniowania sub-THz działającego w oparciu o krzemowy tranzystor MOS).
Wojciech Gwarek, P. Kopyt;
Dec. 22, 2009 – Dec. 21, 2011

The aim of the project is to design the sub-THz radiation detector including low frequency SiC component such a MOSFET. The procedures will be performed by means of electro-thermal and measurement techniques.

[Pro10] **The Development of Anti-aircraft Artillery Radar Tracking Technology Demonstrator** (Opracowanie demonstratora technologii radaru śledzącego do kierowania artylerią przeciwlotniczą).
Daniel Gryglewski, W. Wojtasiak;
Mar. 04, 2011 – Dec. 08, 2012

The project aim is to develop a tracking radar used for precision targeting anti-aircraft artillery. The mastering the production of the radar by the national radar industry would use it in more sets of anti-aircraft military systems. Currently, in the national systems such type, foreign radars are used, which are very expensive. The application domestic radar signify reduce the costs and the systems. In this way, systems can become affordable for domestic and foreign customers. The project is running in cooperation with CNPEP RADWAR S.A.

4.2.4. Research grants

[Pro11] **A fMRI Study of the Patients Recovering from the Stroke** (Badania czynnościowe fMRI chorych usprawnianych po udarze mózgu)
Piotr Bogorodzki, E. Piątkowska-Janko;
Jul. 27, 2008 – Sept. 17, 2011

The aim of the project is to bulid and test a set of devices improving the accessibility of fMRI examinations from stroke disabled patients. This covers electronic gloves for finger tapping paradigm monitoring and pneumatic 'hand' which supports finger movements for muscle paresisi patients.

[Pro12] **Image Reconstruction in Electrical Tomography by Enhanced Nonlinear Optimization Algorithms** (Rekonstrukcja obrazów w tomografii elektrycznej za pomocą ulepszonych algorytmów optymalizacji nieliniowej).
Waldemar Smolik, D. Radomski, P. Czarnecki;
Apr. 4, 2010 – Oct. 6, 2011

Electrical capacitance tomography (ECT) is a non--invasive imaging technique that visualizes a cross--sectional permittivity distribution in a dielectric object by measuring the capacitances between electrodes surrounding this object. ECT has a potential to image some two-phase or multi-phase processes, for example, gas/liquid or liquid/solid in pipelines or in industrial chemical reactors like a bubble column or an air lift. ECT has a great potential of application due to its speed, non-invasive nature and moderate cost. On the other hand, ECT is strongly limited, because of diagnostic accuracy. An improvement in image quality is required. In ECT measured capacitance values are nonlinear function of electric permittivity distribution. Nonlinear ill posed image reconstruction problem may be solved using steepest descent, Newton or Levenberg-Marquardt algorithms. The aim of the project is to enhance these algorithms and to study their performance on the simulated and real measurement data.

[Pro13] **Methods and Algorithms of Measurement Data Processing in Spectrophotometric Analysers of Food** (Metody I algorytmy przetwarzania danych pomiarowych w spektrometrycznych analizatorach żywności).
Roman Z. Morawski, A. Miękina, C. Niedziński, A. Podgórski, N. Obarski, G. Żukowska;
Mar. 11, 2010 – Mar. 01, 2013

Spectrophotometric analysers of food are on the rise, both in terms of the growing number of their applications and in terms of the growing number of their models available on the market. Today, they are applied not only for qualitative and quantitative identification food products and raw materials, but also for evaluation of the nutritional properties of food and beverages. Any spectrophotometric analyser of food is composed of a spectrophotometric transducer, a source of optical radiation, an output interface and a digital signal processor. During last decade, many miniature spectrophotometric transducers have appeared on the market. Their availability and relatively low prices open the prospects for developing a new class of industrial and personal analysers of food. The key problems to be solved now are related to the methods and algorithms of spectrophotometric data processing. The project is aimed at the development of the complex methodology for spectrophotometric data processing dedicated to NIR analysers of food and beverages.

[Pro14] **Application of Multichannel Measurements of Uterine Bioelectrical Activity for Prediction of a Preterm Labour** (Wykorzystanie wielokanałowego pomiaru sygnału aktywności bioelektrycznej mięśnia macicy do wczesnego wykrycia zagrożenia porodem przedwczesnym).
Dariusz Radomski;
Aug. 4, 2010 – Aug. 4, 2013

The aim of the project is to eleborate a new measuring device which enables to measure bioelectrical activities of a pregnant uterus. Moreover, multidimensional signal analysis will be performed to find such model an EHG signal which allows predicting of a preterm labour.

[Pro15] **New Generation of Photonic Atennas for Radio over Fiber Transmission Systems** (Nowa generacja anten fotonicznych dla sieci transmisji radiowo-światłowodowej).
Józef Modelski, Y. Yashchyshyn, K. Kurek, T. Keller, M. Bury;
Apr. 8, 2010 – Apr. 7, 2012

The project involves a design, implementation and experimental study of photonic antennas of different types dedicated to work with e.g. WLAN 802.11a/b/g signals. In the project an optimal way to integrate optoelectronic components (such as laser, photodetector) with radiator would be determined. Furthermore, parameters of photonic antenna would be studied and new methods for their analysis would be developed. The study of photonic antenna is difficult, because in the device two different interfaces: radio and optical, are directly merged.

[Pro16] **New Types of Smart Antennas with Digital Beamforming based on Electronically Reconfigurable Aperture** (Nowe rodzaje inteligentnych anten z cyfrowym kształtowaniem wiązki o rekonfigurowalnej elektronicznie aperturze).
Yevhen Yashchyshyn, K. Derzakowski, J. Marczewski, J. Modelski, D. Tomaszewski, M. Bury;
Apr. 8, 2010 - Apr. 7, 2013

Two main aspects of the project are as follows:

1. Comprehensive investigation, developing and realization of conventional antenna array with digital beamforming.
2. Comprehensive investigation, developing and realization of new type of antenna with reconfigurable aperture realized by means of surface diodes S-PIN. Technological issues regarding S-PIN diode structure and arrangement are included in the research.

[Pro17] **Searching and Adaptation of Multimedia Data: Next Generation Services and Networks – Technical, Application and Market Aspects** (Wyszukiwanie i adaptacja danych multimedialnych w ramach projektu zamawianego pt. ”Usługi i sieci teleinfor-

matyczne następnej generacji – aspekty techniczne, aplikacyjne i rynkowe").
Andrzej Buchowicz, G. Galiński, K. Ignasiak, M. Jakubowski;
Mar. 12, 2008 – Jun. 30, 2011
Commissioned Research Project

The main aim of the project is the analysis of methods for compression, streaming, search and adaptation of multimedia data. Special attention will be paid to video transcoding techniques as well as multimedia data search and retrieval based on MPEG-7 descriptors. In particular, the novel scalable and multiview video coding standards, currently under development within MPEG, protocols for multimedia data streaming, as well as multimedia data descryptors conforming to the MPEG-7 and MPEG-2 standards will be utilized in the project.

4.2.5. Ph.D. grants

[Pro18] **Study of Digital Terrestrial Television Receiver Architectures for DVB-T2 Standard** (Badanie architektur odbiorników cyfrowej telewizji naziemnej standardu DVB-T2).
Józef Modelski, M. Dąbrowski;
Oct. 29, 2010 – Apr. 28, 2012

The aim of the project is to develop comparative criteria of digital terrestrial television receivers in DVB-T2 standard and pointing out the best receiver architecture with respect to those criteria. In this project it is understood that a "receiver" consists of the tuner, which converts input signals into intermediate frequency and filters unwanted signals and the demodulator, which performs digital signal processing including channel estimation and channel decoding. Research conducted within this project will help to propose a detailed architecture of a DVB-T2 receiver.

[Pro19] **Multiscale Methods of Data Representation and Modeling in Medical Imaging Sequences** (Wieloskalowe metody reprezentacji i opisu treści diagnostycznej w medycznych sekwencjach obrazowych).
Artur Przelaskowski, R. Jóźwiak;
Apr. 16, 2010 – Sept. 30, 2011

The project is related to usefulness verification of multiscale methods in medical imaging sequences representation and modeling. The main aim of the project is concentrated on subtle pathology content extraction by means of optimized nonlinear approximation schemes. New and improved computer aided detection schemes in selected application areas (i.e. mammography, ischemic stroke in CT, lung cancer in radiography, skin cancer in high frequency ultrasound) are expected as a final result.

[Pro20] **Low-and High-level Audio Descriptors in Sound Recognition for Databases** (Deskryptory niskiego i wysokiego poziomu w rozpoznawaniu dźwięku dla potrzeb baz danych).
Jan Żera, A. Świercz;
Jun. 9, 2008 – Feb. 26. 2012

Low-level audio descriptors used in the MPEG-7 standard are based on statistical parameters that are only vaguely related to the mechanisms of hearing described in psychoacoustics. The aim of this project is to investigate, whether adding an auditory filter-bank model to the audio descriptor calculation scheme improves the overall algorithm effectiveness. Original and modified audio descriptors are evaluated using various kind of music samples.

[Pro21] **Development of Proteins and Peptides Identification Method in Proteomics** (Opracowanie metody identyfikacji peptydów i białek w zastosowaniu do badań proteomicznych).
Krzysztof Zaremba, L. Raczyński;
Apr. 18, 2011 – Oct. 17, 2012

Proteins identification in biological samples is the most important task in mass spectrometry-based proteomics. In proteomic experiments, the intact proteins are first digested into short peptides, then the resulting peptides are analyzed using tandem mass spectrometry and identified by database search algorithms. In this project a novel peptide identification method is proposed that scores and classifies tandem mass spectra based on the information present in the database search results.

4.3 Projects granted by the University

4.3.1 Statutory projects

[Pro22] **Design and Investigation of Electroacoustic Measuring Systems and Digital Audio Signal Processing Systems** (Projektowanie i badania systemów elektroakustycznych oraz systemów cyfrowego przetwarzania sygnałów fonicznych).
Zbigniew Kulka, P. Bobiński, E. Kotarbińska, A. Leszczyński, M. Lewandowski, M. Tajchert, J. Żera;
Oct. 6, 2010– Nov. 30, 2011

The first part of the project was designed to check an influence of mix-down algorithms on sound quality. The effect of properties of mix-down algorithms and an influence of head related transfer function (HRTF) on quality of mixed sound was investigated. In the second part, implementation of the synchronous sample rate converter (SSRC) utilizing modular audio processing system (MAPS) was done. Two unique features were investigated, i.e. a purely integer calculations assuring high processing quality and modular design enabling rapid development of the SSRC system. The third part of the project was devoted to design and simulation of a non-commercial reverberation algorithm, which included an implementation of a proposed algorithm on a DSP unit and conducting objective and subjective sound assessment.

[Pro23] **Development of Stationary and Distributed Measuring Systems Designing Methods** (Rozwój metod projektowania stacjonarnych i rozproszonych systemów pomiarowych).
Wiesław Winiecki, P. Bilski, P. Czernik, R. Łukaszewski, K. Mroczek, J. Olszyna;
Oct. 6, 2010 – Nov. 30, 2011

The project covers virtual instrumentation and distributed measuring systems. Review of modern methods of computer-aided design of virtual instruments and measurement systems was continued. Methods of designing of measuring systems were developed. Two developed hardware and software

platforms for device software development of embedded systems were work out. One platform used a NI RIO reconfigurable system, the second was developed using microcontroller development board with an ARM7 core. The results of the project also included: the analysis of the time efficiency assessment in the virtual measurement systems, algorithms and circuits for low power secured sensor networks with asymmetric computational resources.

[Pro24] **Contemporary Methods of Modelling and Design of High Frequency Systems** (Współczesne metody analizy i projektowania układów wielkiej częstotliwości).
Wojciech Gwarek, T. Morawski, S. Rosłoniec, M. Celuch, D. Gryglewski, P. Kopyt, P. Miazga, M. Sypniewski, A. Więckowski, W. Wojtasiak, M. Sołtysiak, J. Zborowska, K. Robaczyński, D. Rosołowski, B. Salski, P. Kończak, M. Olszewska, M. Lubiejewski;
Oct. 6, 2010 – Nov. 30, 2011

The project comprised two thematic parts: electromagnetic modelling for microwaves and optics on the one hand, and methods for the design of high power microwave systems on the other hand. Within the first part, electromagnetic modelling methods in the time domain were being developed, with a view to their applications in emerging technologies. The following problems were specifically addressed: coupling of electromagnetic and optical theories, photonic crystals, planar metamaterials, multi-pole dispersive materials, carbon composites, and microwave susceptors. Hybrid electromagnetic-thermal algorithms for microwave power industry were also pursued. Other efforts were related to automatic optimisation and acceleration of simulations by multithread and GPU programming techniques. Within the second part, methods for the design of microwave sources based on wide gap materials were being elaborated. Practical designs included RFID transmission systems and dual-reflector antennas for point-to-point transmission.

[Pro25] **Modern Techniques in Nuclear and Medical Electronics** (Nowoczesne techniki elektroniki jądrowej i medycznej).
Krzysztof Zaremba, P. Bogorodzki, P. Brzeski, G. Domański, T. Jamrógiewicz, B. Konarzewski, R. Kurjata, J. Marzec, T. Olszewski, E. Piątkowska-Janko, D. Radomski, B. Sawionek, W. Smolik, R. Szabatin, M. Ziembicki, S. Adaszewski, M. Dziewiecki, Ł. Kołaszewski, W. Obrębski;
Oct. 6, 2010 – Nov. 30, 2011

AMR compatible stimulation and monitoring device for fMRI of palm motoric.

The aim of this work was to develop the equipment for fMRI studies which allows monitoring of finger movement using MEMS and Bluetooth technology.

Analysis of cornea deformation during intraocular pressure measurement by means of dynamical method.

The aim of the work was to make an analysis of dynamical cornea deformation during intraocular pressure measurement by means of optical technique. The computer program was prepared for simulation of cornea deformation.

Cardiac arrhythmia monitoring.

In this elaboration are presented universal ECG interpretive statement codes to transfer interpretive statements between various ECG analysis systems, also between such systems and clinical workstations and hospital information systems. A common set of statement codes is of utmost importance in order to exchange interpretive ECG messages in a multilingual environment, and is also an important asset for data compression

Study of light sensors based on multi-pixel avalanche photodiodes.

The aim of the project was to characterize novel multi-pixel avalanche photodiodes (MAPD) which are to be used in the newly constructed electromagnetic calorimeter (ECAL0) in the COMPASS experiment in CERN. A series of time and frequency domain measurements have been made and a preliminary electrical model of the detector has been developed. The second task was to build and test a new shaping amplifier for the ECAL0 calorimeter.

Modeling and analyzing of selected physiological processes.

The work was concentrated on a project of a new version of the measuring system destined for uterine bioelectrical activities measuring. In comparing to the previous system the projected version has 4 measuring canals and an amplification is automated adjusted individually for each canal. The signal transmission between an amplifier and a laptop is made through optical fibers to ensure a biological barrier and to minimize electrical distributions.

Electrical tomography techniques applied in medicine and industry.

In the current year, the works on Electrical Capacitance Tomography (ECT) have been focused on new and effective methods for measurement of industrial dynamic processes. The two methods was elaborated: single-shot method I keyless “charge-discharge” method. The complete tomograph models based on the two methods was developed and tested. The measurement results fully confirmed effectiveness of the both methods.

[Pro26] **Methods of the Estimation of the Transmission Ranges and Spectrum Effectiveness in the Wireless Metropolitan WiMAX Networks** (Metody szacowania zasięgów oraz analizy pojemności i wydajności widmowej systemu radiowych sieci metropolitalnych WiMAX).
Józef Modelski, T. Keller, K. Kurek, K. Bryłka, M. Dąbrowski;
Oct. 6, 2010 – Nov. 30, 2011

The main aim of the statutory work were analyses of the modern wireless communication systems based on the IEEE 802.16 specifications. During the work the comparative analysis of different available WiMAX solutions were performed, with a special attention put on the spectrum effectiveness and the effective transmission ranges which can be achieved. During the work the measurement testbed has been prepared for the laboratory and field test of WiMAX systems and the project of the software tool for performing the estimation of the radio transmission ranges was also proposed.

[Pro27] **Methods of Dynamic Parameters Measurements of Reconfigurable Antennas in Time- and Frequency-domain** (Metody pomiaru w dziedzinie czasu i w dziedzinie częstotliwości dynamicznych parametrów anten rekonfigurowalnych).
Yevhen Yashchyshyn, J. Modelski, K. Kurek, T. Keller, K. Derzakowski, M. Bury, P. Bajurko, S. Kozłowski;
Oct. 6, 2010 – Nov. 30, 2011

The subjects of the work are issues related to measuring techniques of time-varying objects, in particular electronically controlled antenna systems. There are two measurement techniques considered: using pulses with time-domain signal acquisition and using swept continuous wave with frequency-domain signal acquisition. Measurement setups using these methods have been developed and arranged. Specific limitations of these techniques and their applicability ranges have been carried out by means of theoretical considerations and the results of numerous experiments. Outstanding results have been obtained by using the developed time-domain method.

[Pro28] **The Data Transfer Techniques in UWB Localization Systems** (Techniki transmisji informacji w ultraszerokopasmowych systemach lokalizacyjnych).
Jacek Cichocki, J. Kołakowski, R. Michnowski, K. Radecki, W. Kiełek, S. Żmudzin, P. Makal, P. Ziętek;
Oct. 6, 2010 – Nov. 30, 2011

Data transmission between nodes in positioning systems has a large impact on the system performance. The project dealt with wire and wireless data transfer techniques between nodes and the control centre in the multilateral version of the system. Within the frames of the project analyses of transmission requirements related to information exchange were carried out. The experimental part of the project consisted in the development of test modules and transmission investigation. The transmission modules based on Ethernet, WLAN, ZigBee standards and CC2500 transceivers were built and tested.

[Pro29] **Improvment of Design Methods for High--efficiency Class-E and Class-F Power Amplifiers** (Doskonalenie metod projektowania wysokosprawnych wzmacniaczy mocy klasy E i klasy F).
Juliusz Modzelewski, H. Chaciński, W. Kazubski, M. Mikołajewski;
Oct. 6, 2010 – Nov. 30 2011

This work concerns optimisation and design of resonant power amplifiers. For the Class E amplifiers problems of their theoretical designs and practical applications in the medium-frequency range (up to 10 MHz) were analyzed. Firstly, it was proved that for such amplifiers non-linearity of the transistor output capacitance must be considered in the design procedure. Secondly, high-frequency power transistors are expensive therefore parameters of medium-frequency Class-E amplifiers with general-purpose switching MOSFET were analysed. Two medium-frequency Class-E amplifiers: 6.78 MHz/150W with STW20NM50 and 10MHz/10W with IRF 520 were designed. Computer simulations showed that these general-purpose low-cost transistors can ensure high efficiency if output resistance of the driving-signal source is sufficiently low. Both amplifiers were built and tested. Their measured efficiency was 90% and 82%, respectively. An analysis of driver circuits for Class E amplifiers was also done, which led to a design of an economical driver. For Class-F amplifiers a new design procedure was proposed in which finite loaded quality factors for harmonic resonant circuits were assumed. The amplifier designed according to this procedure was built and tested. Its measured parameters agreed well with theoretical predictions. The circuit operated at 1MHz with output power 23 W achieving efficiency of 83 %. For Class-AB, Class-B, and Class-C amplifiers an improved method of calculation of the inductance and capacitances in the $\pi 1$ circuit was proposed. This method is based on an assumption that the quality factor of the inductor is finite and the capacitors are lossless. It allows reducing the tuning range of $\pi 1$ circuits in built resonant amplifiers as compared to the traditional calculation methods assuming lossless capacitors and inductor.

[Pro30] **Early Stroke Diagnostics – Extentions of CAD System** (Diagnostyka wczesnego udaru mózgu – rozszerzenia systemu CAD)
Artur Przelaskowski, R. Jóźwiak, G. Ostrek, M. Jasionowska, A. Rutczyńska;
Oct. 6, 2010 – Nov. 30, 2011

The research was carried out with the purpose of extending the functionality served by Stroke Monitor (MU) to support early diagnosis of stroke basing on CT imaging studies. Firstly, the interface was carried out MU for medical information systems according to the DICOM standard, connecting the tool to the real, diverse hospital systems, primarily for high-speed CT image acquisition, as well as, convenient to visualize the extracted information. Communication with the servers of DICOM type, flexible access, transmission and receiving of data from real systems and mechanisms for sharing the results of data processing were ensured. In addition, new concepts of multiscale transformations and approximation algorithms were tested to increase the effectiveness of hypodensity detection. The focus is primarily on the realizations of complex wavelets and forms of sparse representations derived from redundant atom dictionaries. The third important element of our research was to improve methods for automatic identification of ischemic tissue in the indicated areas of interests. Particularly important was the selection of appropriate texture features, constructed as in the image domain, as well as in different spaces with concentration of the signal energy and diversifying semantic components. An important achievement is the ongoing process of commercialization of the MU.

[Pro31] **Modern Radiocommunication Systems – Selected Problems** (Współczesne radiowe systemy ruchome – wybrane problemy).
Tomasz Kosiło, S. Hahn, T. Buczkowski, K. Czerwiński, J. Jarkowski, W. Kazubski, K. Snopek;
Oct. 6, 2010 – Nov. 30, 2011

This work covers theoretical and practical problems of modern radio mobile systems including aspects of theory and applications. The mobile data and multimedia services are still developed from many years. We have the standards, we can find many applications in transportation systems or for handi-

capped persons. The number of multimedia and data transmission application users is still grooving. Because of this it is necessary to develop new transmission algorithm, new methods of radio networks management, to solve problems of electromagnetic compatibility. In the frame of this contract we studied the following problems:

- new methods of signals and systems description;
- study of mobile wireless systems properties and software radio;
- mobile systems for handicapped persons.

[Pro32] **Investigation on Theory and Applications of Multidimensional Signals and Heuristic Methods for Analysis and Design** (Badania w zakresie rozwoju teorii i zastosowań sygnałów wielowymiarowych oraz heurystycznych metod analizy i projektowania).
Jacek Wojciechowski, K. Snopek, D. Piętak, M. Czajko;
Oct. 6, 2010 – Nov. 30, 2011

The aim of the work was to extend a theory of hypercomplex signals, especially quaternionic and octonionic signals, as well as to investigate heuristic optimization algorithms. The first topic included an attempt to standardize a theory of two-dimensional analytic signals (complex and quaternionic), and a summary of previous research on n-dimensional signals. The latter topic included implementation of heuristic optimization algorithms for two purposes: searching for routing paths in a large-scale telecommunication network and analysis of the data from nuclear physics experiments to approximate the shape of nuclei.

[Pro33] **Interpretation of Measurement Data - Methodology and Metametrological Aspects** (Interpretacja danych pomiarowych – metodyka i aspekty meta-metrologiczne).
Roman Z. Morawski, A. Miękina, A. Podgórski;
Oct. 6, 2010 – Nov. 30, 2011

The primary objective of the project is related to the methodological and ethical aspects of metrology, in particular of the design and implementation of algorithms for calibration of measurement channels and reconstruction of measurands (*i.e.* generalised quantities to be measured); the project is also aimed at upgrading the corresponding research infrastructure (both hardware and software). The results of the project include: a methodology for designing algorithms for processing data from optoelectronic transducers of vibrations, and a systematic review of ethical aspects of empirical research based on measurement. The results of the research accomplished have been partially published in a paper, in a chapter of a book, and in a book.

[Pro34] **Audiovisual Network Hybrid Systems** (Audiowizualne sieciowe systemy hybrydowe).
Krystian Ignasiak, W. Skarbek, G. Galiński, A. Buchowicz, G. Pastuszak, S. Badura, M. Leszczyński, J. Naruniec, A. Nowakowski, M. Tomaszewski;
Oct. 6, 2010 – Nov. 30, 2011

The work was the continuation of the development of elements of the new system for digital TV coding including audio and video compression circuits based on the MPEG-4 (H.264/AVC i AAC) standard. Within the works, main function blocks of a software video coder for H.264/AVC were created based on the modularity concept. Getting fast hardware realizations of audio and video coding algorithms and their implementation in FPGA devices enable the verification of the algorithms in real-time conditions. Particularly, hardware PCB devices were designed, mounted, and tested. They include FPGA coupled external memories, ADC/DAC audio/video converters, and supply circuits. The design methodology of audio/video coding was developed for some key codec elements. In particular, the concept of adaptive video coding was applied to the motion estimation unit to different spatial/temporal resolutions and make the encoder robust to wait states. As for audio coding, the AAC encoder was enhanced to support different window lengths with options to adaptively select them. Codecs implementation efforts tend to the creation of a system of network reconfigurable audio-video nodes, which will allow the demonstration of efficiency and usefulness of particular hardware-functional profiles in distributed real-time audiovisual systems.

4.3.2 Projects granted by the Rector

[Pro35] **Analysis and Design of Steerable Microwave Antennas** (Analiza i projektowanie sterowanych anten mikrofalowych).
Yevhen Yashchyshyn, P. Bajurko;
May 21, 2010 - Oct. 31, 2011

The target of the project is to complete laboratory equipment of reconfigurable antenna measurement system. The system allows investigation of the transient states of the antennas comprising switched or tunable elements. Project funds are going to be spent on system components, namely two highly accurate digital pulse delay generators and a microwave pulse generator.

[Pro36] **Hand-held Gamma Camera – Portable Gamma Radiation Spatial Distribution Detector** (Gammakamera hand-held – przenośne urządzenie do pomiaru przestrzennego rozkładu promieniowania gamma).
Ewa Piątkowska-Janko;
Jul. 25, 2011 – Dec. 31, 2011

The project is to assemble the detection pair (PMT and NaI(Tl) crystal), design and build up analog and digital signal processing circuits, dedicated HV power supply and to develop designed cammera testing procedures. R2486 position sensitive photomultiplier and a 6mm thick NaI(Tl) crystal where chosen as a detection pair. Parallely a semiconductor detection system based on CdMnTe crystals is being developed (in cooperation with Institute of Physics of Polish Academy of Sciences and Microsystems Technology and Electronic Materials Division – IMIO, WUT). The project goal is also to develop a procedure of estimating the $\mu\tau$ material parameter of used CdMnTe crystals.

4.3.3. Projects granted by the Dean

[Pro37] **Application of the Artificial Intelligence Applications in the Diagnostics of Analog Systems** (Zastosowanie metod sztucznej inteligencji w diagnostyce systemów analogowych).
Piotr Bilski;
Aug. 26, 2011 – Dec. 31, 2011

The topic of the project is to develop the automated and self-learning methods for analog systems diagnostics. The detailed aim is the analysis of the system's state (i.e. determining, if it works correctly, and what are possible sources of the problems). As such systems are common in the technical and environmental sciences, their analysis and methods for the parameters identification is justified. The project consists in applying modern approaches able to learn from the training data, while the testing data is used for its evaluation. The latter is obtained after simulating models of the selected analog systems. Although in the real world there is the variety of the possible systems, the project focuses on the technical objects, such as electrical machines or electronic circuits (filters, amplifiers, etc.). In the first stage of the projects, models of the systems were simulated to obtain data for training and testing the intelligent method. Then, the selected method (such as support vector machines, fuzzy logic or rough sets) is applied to detect, locate and identify faults in the system with the highest possible accuracy. The approaches used in the project are automated, work in the presence of noise and can be easily compared, which allows for selecting the optimal method to analyze the particular class of the systems.

[Pro38] **Sub-terahertz Imaging** (Obrazowanie obiektów na częstotliwościach subterahercowych).
Marek Bury;
Aug. 26, 2011 – Dec. 31, 2011

Found obtained in project have covered purchase of the mechanical elements: motorized delay line and motorized goniometer as well as peripheral elements, required for experiments with sub-terahertz imaging. That equipment completed measurement setup that is going to serve for further research regarding measurements of sub-teraherz waves transmitted through and reflected from object under test.

4.4 Other projects

[Pro39] **Maintenance and Update of the Visual Signature Technologies Demonstration** (Utrzymanie i uaktualnienie oprogramowania do demonstracji technologii i sygnatury video).
Władysław Skarbek, K. Wnukowicz;
Apr. 26, 2011 – Apr. 30, 2011
Funded by Mitsubishi Electric R&D Centre Europe, UK.

The aim of the project was to continue the development of software for video navigation which could be implemented in products such as BD recorders and TV solutions. The work included maintenance of the previously developed software, and the development of new functionality to improve performance of the software and user interface for video navigation. Another goal of the project was to provide software and cross-validation support in the development of MPEG-7 Video Signature Technology.

[Pro40] **Consultations on the Action to Deal with the Sony Corporation against Companies of the Group LG** (Konsultacje w sprawie postępowania z powództwa Sony Corporation z siedzibą w Tokio oraz Sony Europe Limited z siedzibą w Wielkiej Brytanii przeciwko spółkom z grupy LG.
Józef Modelski, T. Keller;
Sept. 12, 2011
Funded by Piper Wiater Ltd.

4.5 Other activities

4.5.1. Scholarship for the outstanding young scientist granted by the Ministry of Science and Higher Education

Grzegorz Pastuszak
29.11.2011 –28.11.2014

The scholarship is dedicated for the research on efficient hardware implementations for algorithms encoding/decoding audiovisual data. Developed architectures should allow real-time high-resolution processing for low latency, multi-source signals (multi-channel audio and multi-view video), and high-efficient compression. The architectures are mapped into FPGA devices to obtain acceleration.

4.5.2. Partnership

CC-Link

Since 12 May 2005 the Institute of Radioelectronics has been a formal member of the CC-Link Partner Association – the world-wide organization of industrial and research institutions working on the development and applications of CC-Link (Control & Communication Link) – a field network system that processes both the control and information data at high speed, to provide efficient integrated factory and process automation. The collaboration with the Association is realized by the Division of Nuclear and Medical Electronics.

4.5.3. Scientific networks

Polish Network of Neutrino Physics
(Polska Sieć Neutrinowa)

In 2006, the Faculty of Electronics and Information Technology joined the Polish Network of Neutrino Physics. The network compreses several institutes and laboratories working in the field of development of experimental neutrino physics. The Faculty is represented in the network by the Division of Nuclear and Medical Electronics, which has a long-term experience in collaboration with high energy physics (NMC, SMC, COMPASS) and neutrino physics (ICARUS, T2K) experiments.

Polish Network of Particle Astrophysics
(Polska Sieć Astrofizyki Cząstek)

In 2006 the Faculty of Electronics and Information Technology joined the Polish Network of Particle Astrophysics. The main goal of the organization is to create a frame for the research collaboration of several institutes and laboratories in the field of development of advanced experimental methods for particle astrophysics. The Faculty is represented in the network by two research groups: from the Institute of Electronics Systems and from Institute of Radioelectronics – namely from the Division of Nuclear and Medical Electronics.

4.5.4. Student research groups

Space Engineering Student Scientific Group
Krzysztof Kurek – tutor.

Space Engineering Student Scientific Group – SKIK (in Polish Studenckie Koło Inżynierii Kosmicznej) was formed in 2004. Members of SKIK participate in different international and internal educational space projects. Main of them are: project of ESEO (European Student Earth Orbiter) micro-satellite supported by European Space Agency ESA and realized by students from European Universities. Students from Warsaw University of Technology (WUT) are responsible for realization of on-board data handling OBDH subsystem, mechanical configuration of the satellite and operation of the satellite after launch;

- project of PW-Sat pico-satellite, first Polish satellite built by students of WUT, mainly members of Student Space Association and SKIK. The satellite will be launched in 2009 and it will test a new method of de-orbitation using unfoldable solar sail.

Biomedical and Nuclear Engineering Student Scientific Group
Ewa Piątkowska-Janko – tutor.

Biomedical and Nuclear Engineering Student Scientific Group (in Polish Studenckie Koło Inżynierii Biomedycznej i Jądrowej Biomedyczni – (http;//www.ire.pw.edu.pl/biomedyczni) was formed in Dec. 2005 by a group of students from Biomedical Engineering. In 2011 it was reorganised and finally had 25 members. In 2011 they realized Rector grant “Hand-held gamma-camera”. They cooperated with the Student Scientific Group of Cybernetics with their new Neurofeedback project, Students Scientific Group of Dietetics with some software. In 2011 they participated in "Faces of neuroscience" Conference at University of Warsaw.

Innovative Information Technologies Student Scientific Group
Przemysław Miazga – tutor.

The scope of interest of the Students' Circle for Innovative Informatics Technologies was to design a web-service which allow for remote access to the linear/nonlinear optimization package (solver) Cplex form ILOG Ltd. The service consist of a client application with ASP interface and a server link. All parts have been designed with NET technology (VS.NET 2003) on 64 bit platform.

Technique in Medicine Student Scientific Group
Artur Przelaskowski – tutor.

Technique in Medicine Student Scientific Group – SKNTechMed (in Polish Studenckie Koło Naukowe Techniki w Medycynie) was formed in December 2008. The aim of this scientific group is to unite two different spheres: technique and medicine, that cannot perform duties separately. The members of SKNTechMed have a lot of ideas for the start:

- series of open lectures for students led by interesting people from the world of science;
- promotion of Biomedical Engineering among students;
- trips for students to places related with biomedical engineering;

partnership with the Student Scientific Groups from the Medical University of Warsaw

MuGEd Student Scientific Group
Władysław Skarbek – tutor.

MuGEd Scientific Group (in Polish Koło Naukowe MuGEd) (www.ztv.ire.pw.edu.pl/muged) was founded in April 2011, at the Divisiont of Television. The aim of the group is a modern approach to teaching and learning processes by using many kinds of Multimedia in Educational Games (MuGEd). This objective relates to such topics as computer graphics, artificial intelligence, and machine vision, Also, our projects are consulted with experts from other fields such as psychology and pedagogy . Therefore we cooperate with LUDUS scientific group, which is located on Faculty of Education at the University of Warsaw. Together we are working on a project “Enigame”, which is a city game supported by mobile technologies. There is a feeling in the group, that the future belongs to mobile systems, hence the MuGEd works are dedicated to portable devices. The new vision of educational games, creating software for mobile systems and huge interdisciplinary of the work are the hallmarks of our Group.

4.6 Instrumentation investments

4.6.1 Laboratory of hyperpolarized contrast for MRI

Piotr Bogorodzki, E. Piątkowska-Janko, B. Sawionek.
Jan. 2009 - Dec. 2011
Founded by FNiTP (Fundusz Nauki i Technologii Polskiej)

The aim of the project is to build an laboratory of a new hyperpolarisable MRI contrast agents. This aim covers following aspects of MRI of hyperpolarized media: designing and testing new experimental procedures, hyperpolarisation instrumentation designing and methods for MRI data processing. Project was founded by the Polish Science Foundation and has foreseen following activities: purchase of 0.23 T whole body scanner, design of a noble gases (He3) hyperpolarisation system and adaptation of Warsaw University of Technology laboratory.

4.6.2 Centre for Biomedical Technology and Medical Physics

Nuclear and Medical Electronics Division (**Krzysztof Zaremba** – head)
2008 - 2013
Founded by European Regional Development Fund (ERDF) in scope of Operational Programme Innovative Economy (POIG).

The project is a part of the CePT (Centre for Preclinical Research and Technology) biggest biomedical and biotechnological undertaking in Central and Eastern Europe. The CePT project is coordinated by the Medical University of Warsaw in partnership with the University of Warsaw, the Warsaw University of Technology and seven research institutes of the Polish Academy of Sciences. The main objective of BIOFIM is to establish the network of biomedical engineering and biomaterial technology laboratories which will form the base for scientific research and technology implementation. In this Project participates 8 faculties

of Warsaw University of Technology. At present BIOFIM is in a phase of equipment purchasing and organization of laboratories.

4.6.3 Sub-terahertz Technology and An--tenna Laboratory

Yevhen Yashchyshyn, P.Bajurko
2010 - 2012
Founded by European Regional Development Fund (ERDF) in scope of Operational Programme Innovative Economy (POIG).

The project is a part of the Faculty Research Centre FOTEH (Photonics and Terahertz Technologies). *The project* encompasses modernizing of infrastructure of the Antenna Laboratory that enables research on spatial distributions of the electromagnetic field in the millimetre-wave and sub-terahertz range to develop and study of antennas, characterize parameter of materials and designing of the communication, imaging and radar systems.

5. TITLES AND DEGREES AWARDED

5.1. Professor Titles

[Prof1] Wiesław Winiecki - promoted to a professor title (Jan. 19, 2011).

5.2. Ph.D. Degrees

[PhD1] Piotr Lenart: *„Efektywność bezstratnej kompresji wstępnie uporządkowanych danych fonicznych”* (The effectiveness of lossless compression of pre-ordered audio data), Prof. **Z. Kulka** (supervisor), Politechnika Lubelska (Lublin University of Technology), Jun. 8, 2011.

[PhD2] Rafał Młyński: *„Określenie właściwości ochronnika słuchu w warunkach występowania hałasu impulsowego z zastosowaniem modelowania numerycznego”* (Determination of the hearing protector in the presence of impulse noise conditions using numerical modelling), Prof. **J. Żera** (supervisor), Warsaw, Centralny Instytut Ochrony Pracy – Państwowy Instytut Badawczy (Central Institute of Labour Protection - National Research Institute), Mar. 23, 2011.

[PhD3] Teresa Podsiadły-Marczykowska: *„Metody wspomagania procesu interpretacji badań mammograficznych z wykorzystaniem modelu ontologicznego”* (Methods of supporting the interpretation of mammographs using ontological model), Pof. **A. Przelaskowski** (supervisor), Warsaw, Instytut Biocybernetyki i Inżynierii Biomedycznej PAN (Institute of Biocybernetics and Biomedical Engineering), Feb. 18, 2011.

[PhD4] Tomasz Wolak: *„Wykorzystanie techniki aktywnych regionów do wykrywania obszarów o zwiększonej aktywności neuronalnej w mózgu w funkcjonalnej tomografii rezonansu magnetycznego”* (The use of techniques for the detection of active regions, areas with increased neuronal activity in the brain in functional magnetic resonance imaging), Prof. **K. Zaremba** (supervisor), Warsaw, May 17, 2011.

5.3. M.Sc. Degrees

[MSc1] Michał Adamski: *“Akwizycja i realizacja danych elektroencefalograficznych jako narzędzie oceny stanu przytomności pacjenta w znieczuleniu ogólnym”* (Electroencephalographic data acquisition and analysis system as a monitoring system in anesthesiology applications), Assist Prof. **E. Piątkowska-Janko** (supervisor), (MSc. degree with honours).

[MSc2] Piotr Andrzejewski: *„Pozycyjna sonda scyntylacyjna do kamery Hand-Held”* (Position sensitive scintillation probe for Hand-Held gamma-camera), Reader **R. Szabatin** (supervisor), (M.Sc. degree with honours).

[MSc3] Jacek Borkowski: *“Modelowanie systemu zasilania wnęk wielkiej częstotliwości”* (Modeling supply system of RF cavity), Prof. **K. Zaremba** (supervisor), (M.Sc. degree with honours).

[MSc4] Piotr Borkowski: *“Badanie wpływu arytmetyki obliczeń na jakość dźwięku we wtyczkach VST”* (Testing the influence of computations arithmetic on quality of sound in VST plugins), Assist Prof. **M. Tajchert** (supervisor).

[MSc5] Sławomir Brejwo: *“Pulsoksymeter transmisyjny ze złączem Bluetooth”* (Transmission pulse oximeter with Bluetooth connector), Assist Prof. **G. Domański** (supervisor).

[MSc6] Wiktor Chabowski: *„Nadajnik sygnału systemu DCF 77”* (Transmitter of DCF 77 signal), Senior Lecturer **H. Chaciński** (supervisor).

[MSc7] Krzysztof Chojnowski: *“Wykorzystanie sztucznych sieci neuronowych i identyfikacja peptydów w eksperymentach proteomicznych”* (Identification of peptides in proteomics research using artificial neural networks), Assist Prof. **T. Rubel** (supervisor).

[MSc8] Waldemar Chojnowski: *“Aktywny korektor współczynnika mocy”* (Active power factor corrector), Assist Prof. **M. Mikołajewski** (supervisor), (M.Sc. degree with honours).

[MSc9] Marcin Darmetko: *„Analiza możliwości implementacji bloku modulatora systemu DVB-T z wykorzystaniem struktur FPGA”* (Analysis of DVB-T modulators implementation methods for FPGA structures), Assist Prof. **T. Keller** (supervisor), (M.Sc. degree with honours).

[MSc10] Paweł Falaciński: *„Koncepcja i opracowania ultraszerokopasmowego czujnika ruchu”* (The concept and construction of ultra-wideband motion sensor), Reader **J. Cichocki** (supervisor), (M.Sc. degree with honours).

[MSc11] Michał Gasztold: *„Trójantenowy interferometr mikrofalowy na pasmo L zrealizowany w technice linii wielowarstwowych”* (Multi-line tri-antenna L band microwave interferometer), Prof. **S. Rosłoniec** (supervisor).

[MSc12] Konrad Godziszewski: *„Układ wejściowy do odbiornika sygnałów* ultraszerokopasmowych*”* (Input circuit for UWB receiver), Assist Prof. **R. Michnowski** (supervisor), (M.Sc. degree with honours).

[MSc13] Paulina Grochowska: *„Badanie rozkładów dawek detektorami 2D w weryfikacji dozymetrycznej planów leczenia IMRT i IMRS”* (Study of dose distributions using 2D detectors, in dosimetric verification of IMRT and IMRS treatment plans), Reader **P. Brzeski** (supervisor).

[MSc14] Piotr Grządziel: *„Analiza możliwości wykorzystania metody optycznej w badaniach kości”* (Optical method of bone measurement – analysis), Assist Prof. **G. Domański** (supervisor).

[MSc15] Mirosław Jagiełło: *„Opracowanie analizatora dźwięku w środowisku programowym MATLAB”* (Implementation of sound analyzer in MATLAB language), Prof. **J. Żera** (supervisor).

[MSc16] Przemysław Kamiński: *„Przenośny detektor materiałów radioaktywnych”* (Portable detector of radioactive materials), Prof. **J. Marzec** (supervisor).

[MSc17] Marcin Klocek: *„Możliwości struktur FPGA przy implementacji algorytmów szyfrowania na przykładzie AES-128”* (Capabilities of FPGA structures in implementation of cipher algorithms by AES-128 example), Assist Prof. **T. Keller** (supervisor).

[MSc18] Marcin Kłos: *„Elektryczny tomograf pojemnościowy z układem jednokrotnego ładowania rozładowania do obrazowania procesów dynamicznych”* (Electrical capacitance tomograph with single shot charge – discharge circuit for dynamic process imaging), Assist Prof. **W. Smolik** (supervisor).

[MSc19] Adam Kowal: *„Hurtownia danych w medycynie”* (Data warehouse for medical institution), Assist Prof. **M. Kazubek** (supervisor).

[MSc20] Tomasz Krochmal: *„Wzmacniacz mowy na pasmo ISM 2.45 GHZ z wykorzystaniem tranzystora GAN HEMT”* (High power amplifier for ISM 2.45 GHZ band in GAN HEMT technology), Assist Prof. **D. Gryglewski** (supervisor).

[MSc21] Przemysław Kryjan: *„Określenie możliwości wykorzystania komercyjnej sieci komórkowej do transmisji informacji o położeniu w systemie śledzenia obiektów”* (Selection a concept and checking a possibilities of data transmission by commercial mobile network in the GPS location system), Assist Prof. **K. Czerwiński** (supervisor).

[MSc22] Katarzyna Kulma: *„Udoskonalona metoda projektowania obwodów typu π1 do rezonansowych wzmacniaczy mocy”* (Improved method of π1 circuit design for resonant power amplifiers), Assist Prof. **J. Modzelewski** (supervisor).

[MSc23] Artur Laskowski: *„Przenośny odtwarzacz książki mówionej w formacie DAISY”* (Portable device for talking book in DAISY format), Assist Prof. **G. Domański** (supervisor).

[MSc24] Waldemar Latoszek: *„Sieci ze zróżnicowaniem usług (Diffserw) – badanie klas usług sieciowych z zastosowaniem telemedycznym”* (Diffserw network architecture – research of network services in telemedicine applications), Senior Lecturer **T. Jamrógiewicz** (supervisor).

[MSc25] Tomasz Lewicki: *„Rozszerzenie częstotliwościowego zakresu pracy analizatora widma HP E4402B”* (Extention of E4402B spectrum analyzer frequency range), Assist Prof. **R. Michnowski** (supervisor), (M.Sc. degree with honours).

[MSc26] Michał Łosicki: *„Analiza systemów radiografii cyfrowej w stomatologii”* (Anaysis of digital radiography systems for dental imaging), Assist Prof. **G. Domański** (supervisor).

[MSc27] Piotr Łukasik: *„Anteny planarne dla zastosowań w detektorach promieniowania elektromagnetycznego o częstotliwościach terahercowych”* (Microstrip antennas dedicated to detectors of electromagnetic terahertz radiation), Prof. **W. Gwarek** (supervisor).

[MSc28] Dariusz Łysyszyn: *„Bezpieczeństwo aplikacji webowych”* (The security of web applications), Assist Prof. **K. Ignasiak** (supervisor).

[MSc29] Piotr Paweł Marciniuk: *„Miernik energii elektrycznej z interfejsem CC-Link”* (The energy meter module over CC-Link), Assist Prof. **R. Kurjata** (supervisor).

[MSc30] Piotr Marszał: *„Układ odbiorczy radiowysokościomierza lotniczego pracującego z falą ciągłą zmodulowaną częstotliwościowo”* (Receiver of a frequency modulated radio altimeter operating in continuous wave mode), Prof. **S. Rosłoniec** (supervisor).

[MSc31] Piotr Mazur: *„Symulacja minigammakamery”* (Simulation of mini gamma camera), Reader **R. Szabatin** (supervisor).

[MSc32] Paweł Mirgos: *„Oprogramowanie do konwersji i analizy danych spektroskopowych rezonansu magnetycznego”* (Software for conversion and analysis of magnetic resonance spectroscopy data), Assist Prof. **R. Kurjata** (supervisor).

[MSc33] Hubert Miśko: *„Model symulacyjny informatycznej wydajności kwantowej (DQE) sensorów luminescencyjnych”* (Simulation model of information quantum efficiency (DQE) of luminescence sensors), Assist. Prof. **B. Konarzewski** (supervisor).

[MSc34] Tomasz Napiórkowski: *„Odbiornik SDR na pasmo 430 MHz”* (SDR receiver for 430 MHz band), Assist Prof. **W. Kazubski** (supervisor).

[MSc35] Dominika Nielipińska: *„Opracowanie oraz badanie anten szczelinowo-falowodowych dla sieci WLAN standardu IEEE 802.11 ad (60 GHz)”* (Scientific description and investigation of waveguide slot antennas for WLAN (60 GHz)), Prof. **Y. Yashchyshyn** (supervisor).

[MSc36] Adam Niziński: *„System monitoringu aktywności ruchowej człowieka z trans-*

misją bezprzewodową ZigBee" (Human physical activity monitoring system with wireless Zigbee transmission), Assist Prof. **R. Kurjata** (supervisor), (diploma with honours).

[MSc37] Daniel Nolbert: *„Budowa łącza radiowego w paśmie 70 cm do zdalnego sterowania robotem badawczym"* (Construction of a radio link in the band of 70 cm for remote robot control research), Assist Prof. **W. Kazubski** (supervisor).

[MSc38] Łukasz Orlicki: *„Integracja komercyjnego odbiornika systemu nawigacji satelitarnej z mapą cyfrową"* (The integration of global navigation satellite system receiver with a digital map), Assist Prof. **K. Czerwiński** (supervisor).

[MSc39] Jakub Pawluk: *„Mobilna aplikacja wspierania lekarza – asystent lekarza dla urządzeń przenośnych typu smart phone: iPhone, iPad, iPadTouch"* (The mobile application to support physicians – a phy-sician's assistant for mobile devices – smart phones: iPhone, iPad, iPadTouch), Assist Prof. **R. Kurjata** (supervisor).

[MSc40] Maria Peńsko: "*Zastosowanie pomiaru koherencji do oceny jakości akustycznej wnętrz"* (Measurement of a coherence in evaluation of room's acoustic quality), Assist Prof. **M. Tajchert** (supervisor).

[MSc41] Maciej Półrolniczak: *„Model komputerowy toru radiowego systemu LTE w środowisku MATLAB"* (Computer model of LTE radio path in MATLAB environment), Assist Prof. **K. Radecki** (supervisor).

[MSc42] Przemysław Pytlak: *„Zastosowanie metod selekcji cech i klasyfikacji statystycznej w detekcji zaburzeń rytmu serca"* (Application of feature selection methods and stati-stical classification in the detection of cardiac arrhythmia), Assist Prof. **B. Konarzewski** (supervisor).

[MSc43] Bartosz Rogalski: *„Analiza możliwości zastosowania sztucznych sieci neuronowych do wykrywania zaburzeń rytmu serca"* (Analysis of using artifical neural network in heart arrhythmias detection), Senior Lecturer **T. Jamrógiewicz** (supervisor).

[MSc44] Mateusz Rusiniak: *„Jednoczesna rejestracja EEG-fMRI"* (Simulataneous registration of EEG-fmRI), Assist Prof. **E. Piątkowska-Janko** (supervisor).

[MSc45] Piotr Sakowicz: *„Opracowanie stanowiska do analizy drgań z użyciem interferometrii laserowej"* (Designing a work place for analysing vibrations with the use of laser interferometry), Assoc. Prof. **J. Żera** (supervisor).

[MSc46] Konrad Sikorski: *„System do nieinwazyjnego pomiaru prędkości fali pulsu"* (Non-invasive pulse wave velocity measurement system), Assist. Prof. **G. Domański** (supervisor).

[MSc47] Michał Sobieszek: *„Biblioteka kryptograficzna dla środowiska LabWindows/CV1"* (Cryptographic library for the LabWindows/CVI environment), Assist Prof. **R. Łukaszewski** (supervisor).

[MSc48] Michał Stawiński: *„Tranzystorowy wzmacniacz mocy w układzie Dohertyego"* (Doherty power amplifier), Assist Prof. **W. Wojtasiak** (supervisor).

[MSc49] Piotr Stępień: *„Analiza algorytmów detekcji kopii obrazów"* (Analysis of image copy detection algorithms), Assist Prof. **G. Galiński** (supervisor), (M.Sc. degree with honours).

[MSc50] Adam Strupczewski: *„Automatyczne sortowanie obrazów"* (Automatic image sorting), Assist Prof. **G. Galiński** (supervisor), (M.Sc. degree with honours).

[MSc51] Artur Suchocki: *„Obrazowanie w medycynie z wykorzystaniem syntetycznej aparatury ogniskującej"* (Medical imaging using synthetic firing aparature), Assist Prof. **M. Tajchert** (supervisor).

[MSc52] Stanisław Szypowski: *"System do pomiarów charakterystyk promieniowania anten ultraszerokopasmowych"* (A system for ultra-wideband antenna radiation pattern measurement), Assist. Prof. **J. Kołakowski** (supervisor).

[MSc53] Jerzy Świniarski: *„Dynamika wiązki akceleratora ESS LINAC"* (Beam dynamics of ESS LINAC), Prof. **K. Zaremba** (supervisor).

[MSc54] Mariusz Trupinda: *„Transkodowanie strumienia SVC do AVC"* (SVC to AVC bitstream rewirting), Assist Prof. **A. Buchowicz** (supervisor).

[MSc55] Krzysztof Witkowski: *"Stanowisko do charakteryzacji materiałów w zakresie sub-THz"* (Project of position the characterization of materials in sub-THz range), Prof. **Y. Yashchyshyn** (supervisor).

[MSc56] Tomasz Włostowski: *„Precise time and frequency transfer in a White Rabbit network",* Prof. **Z. Kulka** (supervisor), (M.Sc. degree with honours).

[MSc57] Marcin Wolski: *„Szczelinowa antena falowodowa o przestrajanej aperturze"* (Waveguide slot antenna with tunable aperture), Assist Prof. **K. Derzakowski** (supervisor).

[MSc58] Adam Wyszogrodzki: *"System zarządzania flotą pojazdów w małym przedsiębiorstwie"* (Fleet management system in a small company), Prof. **J. Wojciechowski** supervisor).

[MSc59] Grzegorz Zagrajek: *„Zastosowanie najnowszych technologii internetowych do tworzenia systemów dla medycyny"* (Application the newest Internet technologies to create systems for medicine), Prof. **A. Przelaskowski** (supervisor).

[MSc60] Aleksander Zubala: *„Metoda predykcji zniekształceń w stratnie kodowanych strumieniach wideo”* (Metod for predicting distortions in lossy video compression), Prof. **A. Przelaskowski** (supervisor).

[MSc61] Piotr Zybert: *„Urządzenie dozymetryczne dla akceleratora medycznego z interfejsem sieci CC-Link”* (Dosimetry device for medical accelerator with CC-Link network interface), Assist. Prof. **R. Kurjata** (super visor).

5.4. M.Sc. Evening Studies on Radiocommunications – M.Sc. Degrees

[MSc62] Ernest Dargiel: *“Przetwornica przeciwbieżna do laboratorium studenckiego”* (DC/DC flayback converter), Assist Prof. **M. Mikołajewski** (supervisor).

[MSc63] Marcin Gralak: *„Metodyka pomiaru odporności urządzeń na narażenia elektromagnetyczne oraz projekt stanowiska pomiarowego”* (Methodology for measuring resistance on exposure to electromagnetic hazards and design of a measuring stand), Assist. Prof. **M. Laskowski** (supervisor).

[MSc64] Michał Witkowski: *„Dwudrożny zestaw głośnikowy do użytku domowego”* (The design and construction of the loudspeaker system), Prof. **Z. Kulka** (supervisor).

5.5. B.Sc. Degrees

[BSc1] Piotr Radosław Ambroziak: *„Graficzny interfejs użytkownika dla ręcznego miernika spektrometrycznego na platformę ARM CORTEX™ – M3”* (Graphical user interface for handheld radiation spectrometer on ARM CORTEX™ – M3 platform), Assist. Prof. **R. Kurjata** (supervisor).

[BSc2] Tomasz Biały: *“Mikroprocesorowy sterownik obrotnicy anten”* (Microprocessor antenna rotor), Senior Lecturer **H. Chaciński** (supervisor).

[BSc3] Anna Bieńko: *„Program wyznaczający frakcję wyrzutową serca na podstawie badania scyntygraficznego”* (The application calculating cardiac ejection fraction based on scintigraphy imaging data), Reader **P. Brzeski** (supervisor).

[BSc4] Sławomir Biernat: *“Regulowany tłumik mikrofalowy”* (Microwave manual step atenuator), Assist Prof. **R. Michnowski** (supervisor).

[BSc5] Łukasz Błaszczyk: *“Filtry Gabora i ich zastosowanie w obrazowaniu medycznym”* (Gabor filters and their applications in medical image processing), Assist Prof. **K. Snopek** (supervisor), (B.Sc. degree with honours).

[BSc6] Marcin Bocian: *“Współczesna realizacja instrumentu elektronicznego fale Martenota”* (Modern version of electronic instrument Martenot waves), Prof. **Z. Kulka** (supervisor).

[BSc7] Obi Emmanuel Chidiebere: *“A performance comparison of the Five AES Finalists”*, Assist Prof. **A. Paszkiewicz** (supervisor), studies in English.

[BSc8] Marek Ciepłucha: *„Realizacja na układzie programowalnym koprocesora DSP stanowiącego akcelerator dla środowiska GNU Octave”* (FPGA based implementation of digital signal co-procesor as an accelerator for GNU Octave environment), Assist. Prof. **M. Rawski** (supervisor), (B.Sc. degree with honours).

[BSc9] Tomasz Cipkowski: *“Badanie metod transmisji danych w systemach transportu publicznego”* (Multimedia data transmission system in public transport), Assist. Prof. **T. Keller** (supervisor).

[BSc10] Kamil Czajkowski: *“Projekt i pomiary szerokopasmowej anteny o ultrakrótkiej odpowiedzi impulsowej”* (Draft and measurements of a broadband antenna with ultrashort impulse response), Prof. **Y. Yashchyshyn** (supervisor).

[BSc11] Łukasz Czarnota: *„System rozpoznawania gestów ręki na podstawie analizy trajektorii pulsujących diod”* (Hand gesture recognition system based on the analysis of trajectories of pulsating LEDs), Assist Prof. **G. Galiński** (supervisor).

[BSc12] Przemysław Czerepaniak: *„Projekt radiowego systemu lokalizacji osób w terenie miejskim”* (Urban terrain radio frequency localization system project), Assist. Prof. **K. Radecki** (supervisor), (B.Sc. degree with honours).

[BSc13] Błażej Czupryński: *“Pomiar głębi na podstawie ostrości obrazu”* (Depth measurement from image focus), Prof. **W. Skarbek** (supervisor).

[BSc14] Anna Domańska: *„Projekt i realizacja nożnego sterownika MIDI dla gitarzysty”* (Project and realization of MIDI foot controller designed for guitarist), Assist. Prof. **P. Bobiński** (supervisor).

[BSc15] Adam El-Samrout: *“Graficzny interfejs użytkownika do komunikacji między komputerem i modułem XBEE”* (Graphical user interface for communication between PC and XBEE module using LabVIEW), Prof. **W. Winiecki** (supervisor).

[BSc16] Michał Falszewski (co-author: Mariusz Mierzyński): *“Układ komory termoregulowanej wraz z torem optycznym do hiperpolaryzacji He-3”* (Thermoregulation chamber and optical path for hyperpolarization He-3), Assist. Prof. **P. Bogorodzki** (supervisor).

[BSc17] Ofodum Ifeanyi Fedinald: *“Testing of wireless networking technologies in a vehicular systems”,* Assist. Prof. **T. Keller** (supervisor), studies in English.

[BSc18] Daniel Grzywczak: *„Rozpoznawanie obrazów z wykorzystaniem deskryptorów MPEG-7”* (Image recognition using MPEG-7 descriptors), Assist Prof. **G. Galiński** (supervisor).

[BSc19] Yana Guzovskaya: *„Wzmacniacz klasy DE do układu modulacji amplitudy metodą modulacji fazy”* (Class DE power amplifier for amplitude modulator system using phase modulation method), Assist. Prof. **J. Modzelewski** (supervisor).

[BSc20] Michał Hajduczenia: *“Implementacja wybranych algorytmów DSP jako wtyczek VST”* (Implementation of selected DSP algorithms as a VST plugins), Assist. Prof. **P. Bobiński** (supevisor).

[BSc21] Jakub Jusis: *„Opracowanie oraz realizacja stanowiska do pomiaru różnicy fazy w zakresie częstotliwości do 2 GHz”* (Development and realisation of station for phase difference measurement in the frequency range up to 2 GHz), Prof. **Y. Yashchyshyn** (supervisor).

[BSc22] Marta Kalbarczyk: *„Opracowanie układu generacji impulsu UWB z wykorzystaniem kwadraturowej przemiany częstotliwości”* (Development of an UWB signal generator based on quadrature upconversion), Assist. Prof. **J. Kołakowski** (supervisor).

[BSc23] Mateusz Kalinowski: *„Three phase energy counter communicating via radio channel”*, Assist. Prof. **K. Czerwiński** (supervisor), studies in English.

[BSc24] Tomasz Klimczyk: *“Wyznaczanie siatki topologicznej sieci bezprzewodowej na postawie macierzy przyległości węzłów”* (Reconstruction of topological structure map of a wireless network on the basis of nodes adjacency matrix), Assist. Prof. **S. Kukliński** (supervisor), (B.Sc. degree with honours).

[BSc25] Mariusz Klimek: *„Rozproszony system do odczytu kodów kreskowych”* (Distributed system for reading bar codes), Assist. Prof. **K. Ignasiak** (supervisor).

[BSc26] Łukasz Kociszewski: *“Monitorowanie rytmu pracy serca podczas joggingu”* (Heart rate monitoring during jogging), Senior Lecturer **T. Jamrógiewicz** (supervisor).

[BSc27] Małgorzata Kocot: *„Rozproszony system do pomiarów klimatycznych z wykorzystaniem standardu Zigbee”* (Distributed system for climate measurements using the Zigbee standard), Prof. **W. Winiecki** (supervisor).

[BSc28] Dorota Korulczyk: *“Program do symulacji transportu ciepła w tkankach”* (Program to simulate heat transport in tissues), Assist. Prof. **G. Domański** (supervisor).

[BSc29] Bartosz Kossowski (co-author: Jarosław Orzeł): *„Układ cewek Helmholtza do hiperpolaryzacji He-3 i Xe-133 w ekspertmencie SEOP”* (The Helmholtz coils device for hiperpolarization He-3 and Xe-133 in SEOP), Assist. Prof. **P. Bogorodzki** (supervisor).

[BSc30] Jakub Kotecki: *„Opis chodu człowieka za pomocą modelu dynamicznego inter-wariantowego względem czasu obserwacji”* (Description of human gait based on a dynamic model invariant with the respect to the time of observation), Assist. Prof. **J. Dusza** (supervisor).

[BSc31] Marcin Kotz: *„Biofeedback EFG”*, Assist. Prof. **E. Piątkowska-Janko** (supervisor).

[BSc32] Łukasz Kowalczyk: *„Ocena użyteczności kodeka JPEG XR”* (Utility evaluation of the JPEG XR codec), Prof. **A. Przelaskowski** (supervisor), Warsaw University of Technology Distant Learning Center (Ośrodek Kształcenia na Odległość PW).

[BSc33] Krzysztof Kowalczyk: *„Antena z rezonatorem dielektrycznym pobudzenia za pomocą szczeliny o zmiennym kierunku promieniowania”* (The slot feed cylindrical dielectric resonator antenna with reconfigurable radiation direction), Assist. Prof. **K. Derzakowski** (supervisor).

[BSc34] Mateusz Kowalczyk: *„Przetwarzanie równoległe i rozproszone danych otrzymanych z badań czynnościowych fMRI”* (Distributed and parallel fMRI data processing), Assist. Prof. **E. Piątkowska-Janko** (supervisor).

[BSc35] Magdalena Kowalska: *“Osłony zabezpieczenia w zakresie ochrony radiologicznej w zakładzie medycyny nuklearnej stosującym PET”* (Radiation shields and protection measures at nuclear medicine facility), Prof. **N. Golnik** (supervisor).

[BSc36] Kamil Koza (co-author: Jarosław Tokarski); *„Pomiary i ocena hałasu na wybranym terenie Politechniki Warszawskiej”* (Measurements and assessment of noise in the selected area of the Warsaw University of Technology), Assist. Prof. **E. Kotarbińska** (supervisor).

[BSc37] Wioletta Kozłowska: *“Fantom do czynnościowych badań płuc w rezonansie magnetycznym”* (Phantom for functional lung imaging in magnetic resonance), Assist. Prof. **E. Piątkowska-Janko** (supervisor), (5).

[BSc38] Michał Krajewski: *„Rekonstrukcja 3D wykorzystująca detektor linii”* (3D reconstruction using line detector), Prof. **W. Skarbek** (supervisor), (5).

[BSc39] Paweł Krzykwa: „*Performance testing program of GPU processors for 2D/3D algorithms with various arithmetic intensity (OpenCL)”*, Assist. Prof. **M. Sypniewski** (supervisor), studies in English.

[BSc40] Piotr Książarczyk: *„Obwody przestrajania tranzystorów mikrofalowych szerokopasmowych oscylatorów odbiciowych”* (Tuning

circuits of wideband microwave transistor one-part oscillators), Prof. **B. Galwas** (supervisor), Warsaw University of Technology Distant Learning Center (Ośrodek Kształcenia na Odległość PW).

[BSc41] Mariusz Kuran: *"Realizacja szpitalnego systemu informacyjnego na poziomie typowej przychodni"* (Implementation of hospital information system at a typical outpatient clinic), Prof. **A. Przelaskowski** (supervisor).

[BSc42] Mariusz Kurek: *"Tor pomiarowy elektrycznego tomografu pojemnościowego"* (Measuring circuit for electrical capacitance tomography), Reader **R. Szabatin**, (supervisor).

[BSc43] Piotr Lewicki: *"Radiowy układ do lokalizacji mikronadajnika w pomieszczeniu wewnątrz budynku w paśmie 2,4 GHz w oparciu o RSSI"* (An RSSI based radio systems for localization at a typical outpatient clinic), Assist. Prof. **K. Radecki** (supervisor).

[BSc44] Paweł Loska: *"Translator interfejsu OCP--PCI Express dla układu USB Super Speed HOST"* (Translator between interface OCP and PCI Express for USB Super Speed HOST), Assist. Prof. **M. Rawski** (supervisor).

[BSc45] Patrycja Łach: *"Modelowanie odcinka szyjnego kręgosłupa człowieka"* (Human cervival spine modeling), Assist. Prof. **M. Kwacz** (supervisor).

[BSc46] Kamil Łęczycki: *„System do archiwizacji i replikacji sieciowej danych medycznych w standardzie DICOM dla systemu LINUX"* (System for archiving, and network replication of medical data in DICOM standard for LINUX system), Assist Prof. **R. Kurjata** (supervisor).

[BSc47] Konrad Łubianka: *"System rozpoznawania obrazów na podstawie kolorów dominujących"* (Image search system using dominant colors), Assist. Prof. **G. Galiński** (supervisor).

[BSc48] Rafał Maksimiuk: *"Układ do zdalnego wyzwolenia nadajnika UWB drogą radiową"* (Device for wireless triggering an UWB transmitter), Assist. Prof. **J. Kołakowski** (supervisor).

[BSc49] Mariusz Meyer: *"Bezdotykowy pomiar temperatury ciała"* (Non-contact thermometer), Senior Lecturer **T. Jamrógiewicz** (supervisor).

[BSc50] Mariusz Mierzyński co-author: Michał Falszewski): *"Układ komory termoregulowanej wraz z torem optycznym do hiperpolaryzacji He-3"* (Thermoregulation chamber and optical path for hyperpolarization He-3), Assist. Prof. **P. Bogorodzki** (supervisor).

[BSc51] Mariusz Mróz: *"Mikroprocesorowe urządzenie do pomiaru temperatury pacjenta"* (Human body temperature meter microprocessor device), Assist. Prof. **G. Domański** (supervisor).

[BSc52] Piotr Narkun: *„Pierwsza przemiana częstotliwości odbiornika radaru na pasmo 17 GHz-17,5 GHz"* (The first frequency mixing of radar receiver to 17 GHz-17.5 GHz), Assist. Prof. **D. Gryglewski** (supervisor).

[BSc53] Łukasz Nowak: *„Opracowanie detektora impulsów UWB z wykorzystaniem ultraszybkiego komparatora"* (Development of an I-UWB detector based on ultrafast comparator), Assist. Prof. **J. Kołakowski** (supervisor).

[BSc54] Michał Nowak: *„Porównanie formatów zapisu dźwięku wielokanałowego na płytach DVD-video i Blue-ray"* (DVD-Video versus Blue-ray discs – comparison of multichannel sound formats), Prof. **Z. Kulka** (supervisor).

[BSc55] Tomasz Olbrych: *„Mikrofalowy ogranicznik diodowy na pasmo 17-17,5 GHz"* (Microwave PIN diode limiter 17-17.5 GHz), Assist. Prof. **D. Gryglewski** (supervisor), (B.Sc. degree with honours).

[BSc56] Małgorzata Olszewska: *„Program do analizy wykrywania naczyń krwionośnych na drodze optycznej"* (The program for the analysis of blood detection vessels on the optical path), Assist. Prof. **G. Domański** (supervisor).

[BSc57] Jarosław Orzeł (co-author: Bartosz Kossowski): *"Układ cewek Helmholtza do hiperpolaryzacji He-3 i Xe-133 w eksperymencie SEOP"* (The Helmholtz coils device for hiperpolarization He-3 and Xe-133 in SEOP), Assist. Prof. **P. Bogorodzki** (suprisor).

[BSc58] Krzysztof Ryszard Ostrowski: *„Implementacja sprzętowa demultipleksera strumienia transportowego MPEG-2 w VHDL"* (Hardware implementation of MPEG-2 transport stream demultiplexer), Assist. Prof. **G. Pastuszak** (supervisor).

[BSc59] Agata Otrocka: *„Ocena zmian dźwięku po zastosowaniu komprymacji"* (The evaluation of sound change after comprimation), Assoc. Prof. **J. Żera** (supervisor).

[BSc60] Michał Pachocki: *„Oprogramowanie do tworzenia i przeprowadzania badań funkcjonalnych w rezonansie magnetycznym"* (Software for creating and performing functional MRI studies), Assist. Prof. **P. Bogorodzki** (supervisor).

[BSc61] Tadeusz Pieńkowski: *„Opracowanie i badanie anteny ultraszerokopasmowej na pasmo 3,4-10,6 GHz w technologii mikropaskowej"* (Ultra-wideband microstrip antenna – design and measurements), Prof. **Y. Yaschyshyn** (supervisor).

[BSc62] Łukasz Przygodziński: *"Projekt i realizacja wzmacniacza instrumentalnego wraz z kolumną głośnikową"* (Design and

realization of the instrumental amplifier with a loudspeaker), Assist. Prof. **P. Bobiński** (supervisor).

[BSc63] Piotr Rogowski: *„Sterownik tłumików mikrofalowych HP8494H/HP895H"* (HP 8494H/HP895H microwave attenuator driver), Assist. Prof. **W. Wojtasiak** (supervisor).

[BSc64] Aleksandra Różańska: *„Projekt wykonania sieci WiMAX do zapewnienia transmisji w szerokopasmowych sieciach dostępowych"* (The project of implementation WiMAX to ensure transmission in broad--band access networks), Assist. Prof. **T. Keller** (supervisor).

[BSc65] Marek Ruciński: *„Zasilacz wysokiego napięcia i tor sygnałowy polowego detektora neutronów termicznych"* (High voltage power supply and pulse shaping circuit for thermal neutron field detector), Pof. **J. Marzec** (supervisor).

[BSc66] Maciej Ryszkowski: *"Wykorzystanie systemu Norsonic 838 w pomiarach słuchu"* (Measurements of earmuffs with the use of the Norsonic 838 system), Assoc. Prof. **J. Żera** (supervisor).

[BSc67] Mateusz Samsel: *"Rozpoznawanie komend głosowych"* (Voice command recognition), Assist. Prof. **B. Konarzewski** (supervisor).

[BSc68] Igor Samul: *"System przetwarzający dane video z pojedynczej kamery w celu dopasowania modelu boiska do jego obrazu w czasie zbliżonym do rzeczywistego"* (Realisation of near real-time video analyzing software using single camera to match a court model to its image), Prof. **W. Winiecki** (supervisor).

[BSc69] Michał Sierpiński: *"Web application for resources estimation for the 3D EM simulations",* Assist. Prof. **M. Sypniewski** (supervisor), studies in English.

[BSc70] Maciej Sinkiewicz: *"Przyrząd do pomiaru współczynnika głębokości modulacji amplitudy w nadajnikach CB"* (Measuring device for amplitude – modulation depth in CB transmitters), Assist. Prof. **J. Modzelewski** (supervisor).

[BSc71] Kamil Skrzypczyk: *"Realizacja wieloskalowego algorytmu poprawy percepcji obrazów ultrasonograficznych"* (Implemen tation of the multiscale algorithm for improving of perception of ultrasound images), Prof. **A. Przelaskowski** (super--visor).

[BSc72] Maciej Słodczyk: *"Modulacja ORDM oraz jej zastosowanie w szerokopasmowych systemach cyfrowych"* (ORDM modulation and its application in wideband digital systems), Assist. Prof. **M. Tajchert** (supervisor).

[BSc73] Agnieszka Smycz: *"Ocena akustyczna turbin wiatrowych w zakresie infradźwięków"* (The acoustic evaluation of wind turbines in respect to infrasounds and audiable sounds), Assist. Prof. **M. Tajchert** (supervisor), (B.Sc. degree with honours).

[BSc74] Marta Soćko: *"Badanie skuteczności w warunkach rzeczywistych wkładek przeciwhałasowych indywidualnie formowanych dla użytkownika"* (Efficiency evaluation in the real conditions of individually modelled earplugs), Assist. Prof. **E. Kotarbińska** (supervisor).

[BSc75] Kamil Sorokosz: *"Szyfrowanie danych multimedialnych transmitowanych z wykorzystaniem protokołu RTP"* (Encryption multimedia data transmitted using the RTP protocol), Assist. Prof. **A. Buchowicz** (supervisor).

[BSc76] Roch Sójka: *"Tester – analizator interfejsu IEC-625"* (Device for testing and analysis of IEC–625 interface system), Assist. Prof. **R. Łukaszewski** (supervisor).

[BSc77] Bartosz Staryga: *„Wireless network infrastructure"*, Assist. **J. Myrcha** (super visor), studies in English.

[BSc78] Maciej Jerzy Sułecki: *„Projekt cewek wytwarzających jednorodne pole magnetyczne wraz z układem tłumienia pola rozproszonego"* (Design of coils generating uniform magnetic field along with the scattered field suppresion system), Assist. Prof. **E. Piątkowska-Janko** (supervisor).

[BSc79] Eze Sunday: *„Implementation of new concept of stream cipher"*, Assist. Prof. **A. Paszkiewicz** (supervisor), studies in English.

[BSc80] Gracjan Szczęch: *"Redukcja hałasu z wykorzystaniem aktywnego ustroju dźwiękochłonno-izolacyjnego"* (Active noise reduction system consisting of an active sound-absorbing and isolating system), Assist. Prof. **M. Tajchert** (supervisor).

[BSc81] Wojciech Szelągowski: *„Projekt i realizacja wybranych podzespołów układu zapytującego systemu TLS"* (Design and implementation of selected components of the TLS integrator), Prof. **S. Rosłoniec** (supervisor)).

[BSc82] Łukasz Szepioła: *„Układ sterowania gałkami ocznymi robota"* (Control system for robot's eyeballs), Prof. **N. Golnik** (supervisor).

[BSc83] Damian Szubski: *"Projekt stanowiska badawczego do analizy parametrów kinematycznych na podstawie wideorejestracji"* (The project of research station to analysis kinematic parameters using video acquisition), Assist. Prof. **M. Kwacz** (supervisor).

[BSc84] Jan Szymczak: *"Urządzenie do monitorowania pracy serca"* (Simple electrocardiogram with digital output), Assist. Prof. **G. Domański** (supervisor).

[BSc85] Tomasz Tajmajer: *„Reusable visual machine environment for building WSAN middlewares”* (Środowisko do tworzenia warstw pośredniujących z maszyną wirtualną dla bezprzewodowych sieci sensorowych), Assist. Prof. **J. Domaszewicz** (supervisor).

[BSc86] Jarosław Tokarski (co-author: Kamil Koza): *„Pomiary i ocena hałasu na wybranym terenie Politechniki Warszawskiej”* (Measurements and assessment of noise in the selected area of the Warsaw University of Technology), Assist. Prof. **E. Kotarbińska** (supervisor).

[BSc87] Mateusz Łukasz Tomaszkiewicz: *„Kontroler interfejsu IEC-625.2 sterowany przez port RS-232 wykonany w technologii SoPC”* (IEC-625.2 interface controller with RS-232 communication implemented in SoPC system), Assist. Prof. **K. Mroczek** (supervisor).

[BSc88] Hanna Wdowiarska: *“Opracowanie modeli geometrycznych rusztowań kostnych na podstawie badań mikrotomograficznych”* (Development of geometrical models of bone scaffolds based on microtomography date), Assist. Prof. **W. Święszkowski** (supervisor).

[BSc89] Arnold Wierzejski: *„Badanie wpływu parametrów powierzchniowej diody PIN wbudowanej w antenę szczelinową”* (Investigation of the influence of parameters of surface PIN diodes mounted in a slot antenna), Prof. **Y. Yashchyshyn** (supervisor).

[BSc90] Jan Wilczak: *„Modelowanie zmian zawartości cukru i insuliny we krwi”* (Modeling changes in blood sugar and insulin levels), Assist. Prof. **B. Konarzewski** (supervisor).

[BSc91] Szczepan Zalega: *“Program do detekcji obiektów w obrazie statycznym przy użyciu karty graficznej”* (Application for object detection in static image using graphic processor unit), Assist. Prof. **G. Galiński** (supervisor).

[BSc92] Jan Zapał: *„Image processing tool for analysis and modelling of human gait cycle”* Assist. Prof. **Z. Wawrzyniak** (supervisor).

[BSc93] Tomasz Ziółkowski: *“Klasteryzacja danych z mikromacierzy DNA za pomocą samo-organizujących się sieci neuronowych”* (DNA microarray data clustering using self--organising neural networks), Prof. **K. Zaremba** (supervisor).

5.6 B.Sc. Evening Studies on Radiocommunications – B.Sc. Degrees

[BSc94] Tomasz Błachnio (co-author: Adam Grabowski): *“Odbiornik emisji DRM z przemianą kwadraturową”* (DRM emission receiver with quadrature conversion), Assist. Prof. **W. Kazubski** (supervisor).

[BSc95] Łukasz Chrzanowski: *“Analiza trójdrożnego zestawu głośnikowego”* (Analysis of three--way speaker system in vented enclosure), Prof. **Z. Kulka** (supervisor).

[BSc96] Mariusz Dobosiewicz (co-author: Tomasz Wojciechowski): *„Odbiornik FM na pasmo 144-146 MHz”* (FM receiver at 144-146 MHz), Assist. Prof. **W. Kazubski** (super-visor).

[BSc97] Adam Grabowski (co-author: Tomasz Błachnio): *“Odbiornik emisji DRM z przemianą kwadraturową”* (DRM emission receiver with quadrature conversion), Assist. Prof. **W. Kazubski** (supervisor).

[BSc98] Adam Kotarbiński: *“System weryfikacji istnienia potencjalnego konfliktu interesów w kancelarii prawniczej o rozproszonej strukturze biur”* (System for verification of potential conflict of interest in law company with disbursed office structure), Prof. **W. Winiecki** (supervisor).

[BSc99] Tran Binh Nguyen: *“Odbiornik do pomiaru sygnałów w pasmach VLF i LF”* (Receiver for VLF and LF band signal measurements), Assist. Prof. **W. Kazubski** (supervisor).

[BSc100] Andrzej Nowak: *„Analiza sekwencji wideo na potrzeby inteligentnego systemu świetlnego”* (Analysis of video sequences with the object of intelligent light system), Assist. Prof. **P. Garbat** (supervisor).

[BSc101] Artur Piętka: *“Antena z cylindrycznym rezonatorem o poszerzonym paśmie pracy”* (Cylindrical dielectric resonator antenna with enhanced bandwith), Assist. Prof. **K. Derzakowski** (supervisor).

[BSc102] Piotr Sadowski: *„Tranzystorowy wzmacniacz mocy sygnałów fonicznych”* (Transistor power amplifier for audio), Prof. **Z. Kulka** (supervisor).

[BSc103] Michał Trzaskowski: *“Zrównoważony wzmacniacz mikrofalowy”* (A microwave balanced amplifier), Assist. Prof. **J. Piotrowski** (supervisor).

[BSc104] Tomasz Wojciechowski (co-author: Mariusz Dobosiewicz): *„“Odbiornik emisji DRM z przemianą kwadraturową”* (DRM emission receiver with quadrature conversion), Assist. Prof. **W. Kazubski** (supervisor).

6. PUBLICATIONS

6.1. Scientific and technical books, chapters in books

[Pub1] R. Z. Morawski: “Pomiar a etyka badań naukowych” (Measurement and Research Ethics), in: A. Michalski (Ed.): *Metrologia w medycynie. Wybrane zagadnienia*, *Wyd. WAT* (2011), ISBN: 978-83-62954-00-1, pp. 7-33.

[Pub2] R. Z. Morawski: „Etyczne aspekty działalności badawczej w naukach empirycznych” (Ethical Aspects of Research in Empirical Sciences), *Wyd. Uniwersytetu Warszawskiego* (Warsaw University Press) (Warsaw 2011), ISBN 978-83-285-0977-6, 263 pp.

[Pub3] J. Naruniec: “The Methodology for Facial Features Detection”, in: P. Corcoran (Ed.): *New Approaches to Characterization and Recognition of Faces*, *Wyd. InTech* (2011), chapter 11, ISBN: 978-953-307-515-0. pp. 213-224.

[Pub4] D. Radomski, A. Grzanka: „Metodologia badań naukowych w medycynie” (Methodology of Scientific Research in Medicine), *Wydawnictwo Uniwersytetu Medycznego im. Karola Marcinkowskiego w Poznaniu* (2011), ISBN: 978-83-7597-150-7, 100 pp.

[Pub5] D. Radomski, A. Małkiewicz: „Discriminating Power of an Sample Entropy and a Nonlinear Association Index in Prediction of a Preterm Labor Based on Electrohysterographical Signals”, in: R. Burduk, M. Kurzyński, M. Woźniak, A. Żołnierek (Eds.): “Computer Recognition Systems 4”, *Advances in Intelligent and Soft Computing, Springer-Verlag,* ISBN: 978-3-642-20319-0 (2011), pp. 569-577.

[Pub6] S. Żmudzin, G. Barej: „Gospodarowanie częstotliwościami i numeracją” (Spectrum and Numbering Management), in: M. Rogalski (Ed.): *Prawo telekomunikacyjne*, *Wyd. Wolters Kluwer Polska sp. z o.o.*, ISBN: 978-83-264-1257-8 (2011), pp. 555-590.

6.2. Scientific and technical papers in journals

6.2.1 JCR –ISI list journals

[Pub7] K. Abe, N. Abgrall, (...), M. Dziewiecki, R. Kurjata, J. Marzec, K. Zaremba, M. Ziembicki: „Indication of Electron Neutrino Appearance from an Accelerator-Produced Off-Axis Muon Neutrino Beam”, *Physical Review Letters*, vol. 107 (2011), doi: 10.1103/PhysRevLett.107.041801, pp. 04801-1 - 04180-17.

[Pub8] K. Abe, N. Abgrall, (...), M. Dziewiecki, R. Kurjata, J. Marzec, K. Zaremba, M. Ziembicki: „The T2K Experiment”, *Nuclear Instruments and Methods in Physics Research A,* vol. 656 (2011), pp. 69-83.

[Pub9] P. Bilski, J. Wojciechowski: „Rough-Sets-Based Reduction for Analog Systems Diagnostics”, *IEEE Transactions on Instrumentation and Measurement*, vol. 60, no. 3 (2011), doi: 10.1109/TIM.2010.2060225, pp. 880-890.

[Pub10] M. Celuch, M. Sołtysiak, U. Erle: "Computer Simulations of Microwave Heating with Coupled Electromagnetic, Thermal, and Kinetic Phenomena", *Applied Computational Electromagnetics Society Journal*, vol. 26, no. 4 (Apr 2011), pp.275-284.

[Pub11] P. Czernik, W. Winiecki: „Infrastruktura klucza publicznego do zastosowań w bezpiecznych Rozproszonych Systemach Pomiarowo-Sterujących” (Public Key Infrastructure for Use in Secure Distributed Measurement and Control Systems), *Przegląd Elektrotechniczny* (Electrical Review), vol. 87, no. 9a (2011), pp. 37-44.

[Pub12] E. Kozłowski, J. Żera, R. Młyński: „Effect of Musician’s Earplugs on Sound Level and Spectrum During Musical Performances”, *International Journal of Occupational Safety and Ergonomics (JOSE)*, vol. 17, no. 3 (2011), pp. 249-254.

[Pub13] N. Krześniak, A. Paziewska, T. Rubel, M. Skrzypczak, M. Mikuła, A. Dzwonek, K. Goryca, L. S. Wyrwicz, D. Jarosz, D. Laubitz, M. Woszczyński, K. Bielecki, J. Ostrowski: „Gene Expression Alterations Induced by Low Molecular Weight Heparin During Bowel Anastomosis Healing in Rats”, *Acta Biochimica Polonica*, vol. 58, no. 1 (2011), pp. 79-87.

[Pub14] Z. Kulka: “Advances in Digitization of Microphones and Loudspeakers”, *Archives of Acoustics*, vol. 36, no. 2 (2011), doi: 10.2478v10168-011-0030-z, pp. 419-436.

[Pub15] Z. Kulka: “Sampling Jitter in Audio A/D Converters”, *Archives of Acoustics*, vol. 36, no. 4 (2011), pp. 831-849.

[Pub16] M. Lewandowski: “Noise Transfer Function Design and Optimization for Digital Sigma-Delta Audio DAC”, *Archives of Acoustics*, vol. 36, no. 1 (2011), doi: 10.2478v10168-011-0008-x, pp. 87-108.

[Pub17] A. Majos, T. Wolak, M. Sapieha, M. Olszycki, P. Bogorodzki, Ł. Stefańczyk: „Dynamic T1 Functional MRI Examinations with Use of Blood Pool Contrast Agent – An Approach to Optimization of the Technique”, *Clinical Imaging*, vol. 35, no. 5 (2011), pp. 385-390.

[Pub18] P. L. Makowski, R. Z. Morawski, Ł. Michalik, A. W. Domański: „An Efficient Algorithm for Processing Data from a Multipoint Sensor of Vibrations”, *Measurement – Journal of IMEKO* (2011), doi: 10.1016/j.measurement.2011. 08.002, pp. 2060-2067.

[Pub19] M. Mikuła, T. Rubel, J. Karczmarski, K. Goryca, M. Dadlez, J. Ostrowski: „Integrating Proteomic and Transcriptomic High-throughput Surveys for Search of New Bimarkers of Colon Tumors", *Functional & Integrative Genomics*, vol. 11, issue 2, doi: 10.1007/s10142-010-0200-5 (2011), pp. 215-224.

[Pub20] Ł. Milewski, P. Dziunycz, E. Barcz, D. Radomski, P. I. Roszkowski, G. Korczak-Kowalska, P. Kamiński, J. Malejczyk: „Increased Levels of Human Neutrophil Peptides 1, 2, and 3 in Peritoneal Fluid of Patients with Endometriosis: Association with Neutrophils, T Cells and IL-8", *Journal of Reproductive Immunology*, vol. 91, no. 1-2 (2011), pp. 64-70.

[Pub21] J. Modelski: „Eastern Europe and the Middle East: Microwave Sensors", *IEEE Microwave Magazine*, vol. 12, no. 3, doi: 10.1109/MMM.2011.940322 (2011), pp. 113-117.

[Pub22] M. Olszewska, W. K. Gwarek: "A Dual Reflector Antenna for Point-to-point Systems Applications", *Acta Physica Polonica A*, vol. 119, no. 4, (Apr 2011), pp. 558-562.

[Pub23] J. Olszyna, W. Winiecki: „Niskomocowa realizacja algorytmu mnożenia modularnego Montgomery'ego dla rozproszonych systemów pomiarowo-sterujących" (Low-power Implementation of Montgomery Modular Multiplication Algorithm for Distributed Measurement and Control Systems), *Przegląd Elektrotechniczny*, vol. 87, no. 9a (2011), pp. 69-71.

[Pub24] C. Rubbia, M. Antonello, P. Aprili, (...), P. Płoński, K. Zaremba: „Underground Operation of the ICARUS T600 LAr-TPC: First Results", *Journal of Instrumentation*, doi: 10.1088/1748-0221/6/07/ P07011, pp. 5-12.

[Pub25] A. Sikora, J. Wójtowicz-Sieńko, P. Piela, U. Zielenkiewicz, K. Tomczyk-Żak, A. Chojnacka, R. Sikora, P. Kowalczyk, E. Grzesiuk, M. Błaszczyk: „Selection of Bacteria Capable of Dissimilatory Reduction of Fe(III) from a Long-term Continuous Culture on Molasses and their Use in a Microbial Fuel Cell", *Journal of Microbiology and Biotechnology*, vol. 3, no. 21 (2011), doi: 10.4014/jmb.1006.06022, pp. 305-316.

[Pub26] A. Vacheret, G. J. Barker, M. Dziewiecki (...), R. Kurjata, J. Marzec, K. Zaremba, M. Ziembicki: „Characterization and Simulation of the Response of Multi-Pixel Photon Counters to Low Light Levels", *Nuclear Instruments and Methods in Physics Research A*, vol. 656 (2011), pp. 69-83.

6.2.2. MSHE list journals

[Pub27] A. Abramowski: „Towards H.265 Video Coding Standard", *Proc. of SPIE: Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments*, vol. 8008 (2011), pp. 8008--75 - 8008-88.

[Pub28] A. Abramowski, G. Pastuszak: "Propozycja architektury dekodera arytmetycznego standardu H.264/AVC" (Proposition of the Arithmetic Decoder Architecture for the H.264/AVC Standard) *Pomiary Automatyka Kontrola PAK* (Measurement, Automation, and Monitoring), no. 1, vol. 57, (2011) pp. 49-51.

[Pub29] P. Bajurko: "Pomiary dynamicznych parametrów przełączanej sieci zasilającej układu antenowego" (Measurements of Dynamic Parameters of the Switched Antenna Feeding Network), *Przegląd Telekomunikacyjny i Wiadomości Telekomunikacyjne* (Telecommunication Review and Telecommunication News), vol. LXXX, no. 6 (2011), pp. 440-443.

[Pub30] P. Bajurko, Y. Yashchyshyn: „System antenowy dla robota mobilnego" (Antenna System for Mobile Robot), *Przegląd Telekomunikacyjny i Wiadomości Telekomunikacyjne* (Telecommunication Review and Telecommunication News), vol. LXXX, no. 6 (2011), pp. 523-526.

[Pub31] A. Bilski: "A Review of Artificial Intelligence Algorithms in Document Classification", *International Journal of Electronics and Telecommunications*, no. 3, vol. 57 (2011), doi: 10.2478/v10177-011-0035-6, pp. 263-270.

[Pub32] G. Brzuchalski: „Quantization and Psychoacoustic Model in Audio Coding", *Proc. of SPIE: Photonics Applications in Astronomy, Communications, Industry, and High--Energy Physics Experiments*, vol. 8008 (2011), pp. 8008-72-8008-77.

[Pub33] G. Brzuchalski, G. Pastuszak: „Sprzętowa implementacja modułu transformaty kodeka MPEG-4 AAC" (Hardware Implementation of the Transformation Module of the MPEG-4 AAC Codec), *Pomiary Automatyka Kontrola PAK* (Measurement, Automation and Monitoring), no. 1, vol. 57 (2011), pp. 42-44.

[Pub34] A. Buchowicz, G. Galiński: „Strumieniowa transmisja danych wizyjnych kodowanych w standardzie H.264/AVC z wykorzystaniem grup makrobloków" (Streaming Video Data Encoded Using the Standard H.264/AVC Macroblock Groups), *Przegląd Telekomunikacyjny i Wiadomości Telekomunikacyjne* (Telecommunication Review and Telecommunication News), vol. LXXX, no. 6 (2011), pp. 656-659.

[Pub35] A. Buchowicz, G. Galiński: „Video Streaming Framework", *International Journal of Electronics and Telecommunications*, no. 3, vol. 57 (2011), pp. 102-108.

[Pub36] B. Chrabski, P. Zawistowski: „Architektura systemów informatycznych w nowoczesnych przedsiębiorstwach telekomuni-

kacyjnych", (The Architecture of Modern Information Systems in Telecommunication Enterprises), *Przegląd Telekomunikacyjny i Wiadomości Telekomunikacyjne* (Tele--communication Review and Telecommunication News), no. 12 (2011), pp. 1626-1631.

[Pub37] M. Darmetko, M. Klocek, B. Majewski, K. Kurek, T. Keller, M. Piasecki: „Realizacja toru cyfrowego przetwarzania sygnału dla nadajnika DVB-T w strukturze FPGA" (Implementation of Digital Signal Processing Circuit for DVB-T Transmitter in the FPGA Structure), *Przegląd Telekomunikacyjny i Wiadomości Telekomunikacyjne* (Telecommunication Review and Telecommunication News), vol. LXXX, no. 6 (2011), pp. 620-623.

[Pub38] M. Dąbrowski, M. Wilczyński, P. Bieniek: „Pomiary jakości sygnału sieci nadawczej MUX3" (Measurements of MUX3 Signal Quality), *Przegląd Telekomunikacyjny i Wiadomości Telekomunikacyjne* (Tele--communication Review and Telecommunication News), vol. LXXX, no. 6 (2011), pp. 428-431.

[Pub39] K. Godziszewski, R. Michnowski: „Układ wejściowy do odbiornika sygnałów ultraszerokopasmowych" (Input Circuit for UWB Receiver), *Przegląd Telekomunikacyjny i Wiadomości Telekomunikacyjne* (Telecommunication Review and Telecommunication News), vol. LXXX, no. 6 (2011), pp. 534-537.

[Pub40] S. L. Hahn, K. M. Snopek: "The Unified Theory of n-dimensional Complex and Hypercomplex Analytic Signals", *Bulletin of the Polish Academy of Sciences. Technical Sciences*, vol. 59, no. 2 (2011), doi: 10.2478 v10175-11-0021-2, pp. 167-181.

[Pub41] M. Jakubowski: "Adaptive Motion Estimation Design with Hardware-specific Constraints", *Proc. of SPIE: Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments*, vol. 8008 (2011), pp. 8008-88 - 8008 -101.

[Pub42] M. Jasionowska, A. Przelaskowski: "Multiscale Modeling of Local Directional Mammogram Findings", *Journal of Medical Informatics and Technologies*, vol. 17 (2011), pp. 183-190.

[Pub43] M. Jędryka: "Analysis of 3D Hierarchical Temporal Memory for Visual Object Tracking", *Proc. of SPIE: Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments*, vol. 8008 (2011), pp. 8008-101-8008-108.

[Pub44] R. Jóźwiak, A. Przelaskowski, G. Ostrek: „Conceptual Improvements in Computer--aided Diagnosis of Acute Stroke", *Journal of Medical Informatics and Technologies*, vol. 17 (2011), pp. 191-199.

[Pub45] M. Kalbarczyk, J. Kołakowski: "Wykorzystanie mieszacza kwadraturowego do generacji impulsu w ultraszerokopasmowym systemie lokalizacyjnym" (The Usage of Quadrature Mixer for Generating Impulse in Ultrabroadband Localization System), *Przegląd Telekomunikacyjny i Wiadomości Telekomunikacyjne* (Telecommunication Review and Telecommunication News), vol. LXXX, no. 6 (2011), pp. 538--541.

[Pub46] W. Kazubski: "Wzmacniacz wstępny nadajnika DRM na pasmo 26 MHz" (Preliminary Transmitter of DRM Amplifier at 26 MHz Band), *Przegląd Telekomunikacyjny i Wiadomości Telekomunikacyjne* (Telecommunication Review and Telecommunication News), vol. LXXX, no. 6 (2011), pp. 444-446.

[Pub47] J. Kołakowski: "Radiowe techniki lokalizacji obiektów w pomieszczeniach" (Indoor Radio Positioning Techniques), *Przegląd Telekomunikacyjny i Wiadomości Telekomunikacyjne* (Telecommunication Review and Telecommunication News), vol. LXXX, no. 6 (2011), pp. 206-213.

[Pub48] *J.* Kołakowski: "An Evaluation of Ultra--Wideband Leading Edge Detection Positioning Receivers", *Przegląd Telekomunikacyjny i Wiadomości Telekomunikacyjne* (Telecommunication Review and Telecommunication News), vol. LXXX, no. 2-3 (2011), pp. 87-90

[Pub49] P. Korpas, D. Gryglewski, W. Wojtasiak, W. Gwarek: "A Computer-controlled System of High-power Microwave Sources", *International Journal of Electronics and Telecommunications*, no. 3, vol. 57 (2011), doi: 10.2478/v10177-011-0018-7, pp. 121--126.

[Pub50] P. Kopyt, D. Gryglewski, P. Korpas, W. Wojtasiak, W. Gwarek: „Charakteryzacja elektryczna ceramicznej oprawki tranzystora RF" (Electrical Characterization of a RF Transistor Package), *Elektronika-Konstrukcje-Technologie-Zastosowania,* vol. 52 (2011), pp. 82-84.

[Pub51] S. Kozłowski: „Badania symulacyjne i eksperymentalne adaptacyjnego systemu MIMO" (Computer Simulations and Experimental Investigations of Adaptive MIMO System), *Przegląd Telekomunikacyjny i Wiadomości Telekomunikacyjne* (Tele--communication Review and Telecommuni--cation News), vol. LXXX, no. 6 (2011), pp. 463-466.

[Pub52] Z. Kulka: „Od monotonii do stereofonii wielokanałowej" (From Mono to Surround Sound), *Elektronika-Konstrukcje-Technologie-Zastosowania*, vol. 52 (2011), pp. 9--15.

[Pub53] K. Kurek, J. Jarkowski, J. Modzelewski, W. Kazubski, H. Chaciński, J. Modelski: „Pierwsza w Polsce emisja testowa systemu radiofonii cyfrowej DRM" (The First in Poland Testing Emission of DRM Digital

Broadcasting), *Przegląd Telekomunikacyjny i Wiadomości Telekomunikacyjne* (Telecommunication Review and Telecommunication News), vol. LXXX, no. 6 (2011), pp. 588-591.

[Pub54] R. Łukaszewski, P. Bilski, K. Mroczek: „Wykorzystanie w dydaktyce rekonfigurowalnych przyrządów pomiarowo-sterujących i systemów wbudowanych", (The Use of Reconfigurable Measuring Systems and Control Devices and Embedded Systems in Education), *Pomiary Automatyka Kontrola PAK* (Measurement, Automation and Monitoring), no. 11 (2011), pp. 1329-1333.

[Pub55] R. Łukaszewski, M. Sobieszek, P. Bilski: „Implementation and Analysis of Elliptic Curves-Based Cryptographic Algorithms in the Integrated Programming Environment", *International Journal of Electronics and Telecommunications*, no. 3, vol. 57 (2011), doi: 10.2478/v10177-011-0034-7, pp. 257--262.

[Pub56] P. Makal: „Poprawa dokładności detekcji impulsów UWB w odbiorniku kwadraturowym" (UWB Pulse Detection Accuracy Improvement in the Quadrature Receiver), *Zeszyty Naukowe Wydziału Elektroniki, Telekomunikacji i Informatyki Politechniki Gdańskiej*, *seria: ICT Young*, no. 9, vol. 1 (2011), pp. 357-362.

[Pub57] P. Makal: „Metoda detekcji impulsów w odbiorniku kwadraturowym ultraszerokopasmowego systemu lokalizacyjnego" (A Method for the Detection of Pulses in the UWB Positioning System Quadrature Receiver), *Przegląd Telekomunikacyjny i Wiadomości Telekomunikacyjne* (Tele--communication Review and Telecommuni -cation News), vol. LXXX, no. 6 (2011), pp. 542-545.

[Pub58] R. Maksimiuk, J. Kołakowski: "Układ wyzwalania etykiety w ultraszerokopasmowym systemie lokalizacyjnym" (A UWB Localization System Tag Triggering Device), *Przegląd Telekomunikacyjny i Wiadomości Telekomunikacyjne* (Telecommunication Review and Telecommunication News), vol. LXXX, no. 6 (2011), pp. 467-470.

[Pub59] A. Miękina, A. Podgórski: „Digital-Filter-Based Compensation of Case Effect in Sound-Level Meters", *International Journal of Electronics and Telecommunications*, no. 3, vol. 57 (2011), doi: 10.2478/v10177-010-0034-z, pp. 263-266.

[Pub60] P. Miazga: „Topological Synthesis of Tree Shaped Structures Based on a Building Blocks Hypothesis", *Journal of Telecommunications and Information Technology*, no. 4 (2011), pp. 45-49.

[Pub61] M. Mikołajewski: „Wzmacniacz klasy E z regulacją mocy wyjściowej metodą grup impulsów" (A Class E Amplifier with Burst Output Power Control), *Wiadomości Elektrotechniczne*, vol. LXXIX, no. 11 (2011), pp. 50-52.

[Pub62] R. Milner, M. Rusiniak, T. Wolak, E. Piątkowska-Janko, P. Naumczyk, P. Bogorodzki, A. Senderski, M. Ganc, H. Skarżyński: „Application of Simultaneous Auditory Evoked Potentials and Functional Magnetic Resonance Recordings for Examination of Central Auditory System – Preliminary Results", *Otolaryngologia Polska*, vol. 65, no. 3 (2011), pp. 171-183.

[Pub63] J. Modelski, T. Keller, M. Dąbrowski: „Kierunki rozwoju multimedialnych sieci HFC" (Development Trends of the Multimedia HFC Networks), *Przegląd Telekomunikacyjny i Wiadomości Telekomunikacyjne* (Telecommunication Review and Telecommunication News), vol. LXXX, no. 8-9 (2011), pp. 713-722.

[Pub64] J. Naruniec: „Filtry Gabora a dyskretne filtry obszarowe w ekstrakcji cech charakterystycznych punktów twarzy" (Gabor Filters vs. Discrete Area Filters in the face Fiducial Points), *Przegląd Telekomunikacyjny i Wiadomości Telekomunikacyjne* (Telecommunication Review and Telecommunication News), vol. LXXX, no. 6 (2011), pp. 660-663.

[Pub65] D. Nielipińska, Y. Yashchyshyn: „Badanie anten szczelinowo-falowodowych dla sieci WLAN standardu IEEE 802.11ad (60 GHz)" (Investigation of the Waveguide – Slots Antennas for IEEE 802.11 ad (60 GHz) WLAN Standard), *Przegląd Telekomunikacyjny i Wiadomości Telekomunikacyjne* (Telecommunication Review and Telecommunication News), vol. LXXX, no. 6 (2011), pp. 519-522.

[Pub66] Ł. Nowak, J. Kołakowski: „Wykorzystanie komparatora do detekcji impulsów w ultraszerokopasmowym systemie lokalizacyjnym" (An Application of a Comparator for the Detection of Pulses in the UWB Localization System), *Przegląd Telekomunikacyjny i Wiadomości Telekomunikacyjne* (Telecommunication Review and Telecommunication News), vol. LXXX, no. 6 (2011), pp. 546-549.

[Pub67] P. Płoński, J. Radomski: „Translacja drzew filogenetycznych" (Translation of Philogenetic Trees), *Zeszyty Naukowe Wydziału Elektroniki Telekomunikacji i Informatyki Politechniki Gdańskiej*, vol. 9 (2011), pp. 465-470.

[Pub68] K. Radecki, P. Lewicki, J. Marski: „Lokalizacja terminala radiowego z wyjściem RSSI wewnątrz korytarza budynku" (Localization of RSSI Radio Terminal Inside the Building Corridor), *Przegląd Telekomunikacyjny i Wiadomości Telekomunikacyjne* (Telecommunication Review and Telecommunication News), vol. LXXX, no. 6 (2011), pp. 479-482.

[Pub69] S. Rosłoniec: "An Example of Two--dimensional Interpolation Using a Linear Combination of Bicubic B-splines", *International Journal of Electronics and Telecommunications*, no. 3, vol. 57 (2011), pp. 293-299.

[Pub70] D. Rosołowski, W. Wojtasiak, D. Gryglewski: „27 dBM Microwave Amplifiers with Adaptive Matching Networks", *International Journal of Electronics and Telecommunications*, no. 3, vol. 57 (2011), doi: 10.2478/v10177-011-0015-x, pp. 103-108.

[Pub71] M. Roszkowski: "Overview of the Major Challenges in the Wide Baseline Stereo Vision", *Proc. of SPIE: Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments*, vol. 8008 (2011), invited paper, pp. 8008-74-8008-75.

[Pub72] M. Roszkowski, G. Pastuszak: "Moduł predykcji Intra dla sprzętowego dekodera standardu H.264/AVC" (Intra Prediction Module for the H.264/AVC Hardware Decoder) *Pomiary Automatyka Kontrola PAK* (Measurement, Automation, and Monitoring), no. 1, vol. 57 (2011) pp. 46-48.

[Pub73] M. Roszkowski, G. Pastuszak: "Sprzętowy moduł predykcji INTRA dla kodera standardu H.264/AVC, z obsługą profilu High i przeszukiwaniem wszystkich trybów predykcji" (Intra Hardware Prediction Module for the H.264/AVC Coder Supporting High Profile and All Prediction Modes) *Elektronika-Konstrukcje-Technologie-Zastosowania*, no. 5, vol. 52, (2011) pp. 80-84.

[Pub74] A. Rudziński: "Układy kompensacji echa sygnału nadawanego przez sprzężenie z obwodem zasilania odbiornika" (System with Echo Cancellation by Coupling to Receiver's Power Supply Circuit), *Przegląd Elektrotechniczny*, no. 12a (2011), pp. 201--205.

[Pub75] K. M. Snopek: „The New Insight into the Theory of 2-D Complex and Quaternion Analytic Signals", *International Journal of Electronics and Telecommunications*, no. 3, vol. 57 (2011), doi: 10.2478/v10177 - 011-0038-3, pp. 285-291.

[Pub76] K. M. Snopek, S. L. Hahn: "The Unified Theory of n-Dimensional Complex and Hypercomplex Analytic Signals," *Bulletin Polish Academy of Science –Technical* Science, vol. 59, no. 2 (2011), pp. 167--181.

[Pub77] A. Urzędowska, Y. Yashchyshyn: „Badanie dwupolaryzacyjnej fotonicznej stacji antenowej dla systemów RoF" (Study of Dual Polarized Photonic Antenna Station for RoF Systems), *Przegląd Telekomunikacyjny i Wiadomości Telekomunikacyjne*, vol. LXXX, no. 6 (2011), pp. 531-533.

[Pub78] M. Wieczorek: "Rate Control for Multiview Systems", *Proc. of SPIE: Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments*, vol. 8008 (2011), pp. 8008-73-76.

[Pub79] M. Wieczorek, G. Pastuszak: "Sprzętowa implementacja dekodera nagłówków i dekodera CAVLC w standardzie kompresji wideo H.264/AVC" (Hardware Implementation of Header and CAVLC Decoder for the H.264/AVC Standard) *Pomiary Automatyka Kontrola PAK* (Measurement, Automation, and Monitoring), no. 1, vol. 57 (2011) pp. 64-66.

[Pub80] W. Wojtasiak, D. Gryglewski: „A 100 W SiC MESFET Amplier for L-band T/R Module of APAR", *International Journal of Electronics and Telecommunications*, no. 3, vol. 57 (2011), doi: 10.2478/v10177-011-0020-0, pp. 135-140.

[Pub81] P. Ziętek, J. Kołakowski: „Zmodyfikowana metoda wyznaczania różnicy czasów propagacji sygnałów impulsowych z liniową modulacją częstotliwości" (A Modified Method for Determination of Chirp Pulses Time Difference of Arrival), *Przegląd Telekomunikacyjny i Wiadomości Telekomunikacyjne*, vol. LXXX, no. 6 (2011), pp. 471-474.

6.2.3. Other journals

[Pub82] P. Ziętek: "Improved Method for TDOA Estimation with Chirp Signals", *Challenges of Modern Technology*, vol. 2, no. 1 (2011), pp. 32-35.

6.2.4. Publications on general aspects of science, technology and education

[Pub83] J. Cichocki: "Radiokomunikacja i techniki multimedialne" (Radiocommunications and Multimedia Technologies), in: R. Z. Morawski (Ed.), *Wydział Elektroniki i Technik Informacyjnych Politechniki Warszawskiej na progu XXI wieku, 2001–2011*, *Zbiór esejów pod redakcją Romana Z. Morawskiego wydany z okazji Jubileuszu Sześćdziesięciolecia Wydziału Elektroniki i Technik Informacyjnych Politechniki Warszawskiej* (Faculty of Electronics and Information Technology, on the verge of the XXIst Century, Book of essays, published on the occasion of the 60th Anniversary of the Faculty of Electronics and Information Technology). *Oficyna Wydawnicza PW* (Warsaw University of Technology Press) (Warsaw 2011), ISBN 978-83-7207-969-5, pp. 141-157.

[Pub84] R. Gawroński, M. Karpierz, A. Kraśniewski, J. Kubissa, M. Kujawińska, B. Macukow, R. Z. Morawski, T. Zielińska, Z. Turowski, P. Koza, P. Rążewski: „Strategia Rozwoju Politechniki Warszawskiej do roku 2020" (Strategy of Development of the Warsaw Technical University till 2020), *Oficyna Wydawnicza PW* (Warsaw 2011), 86 pp.

[Pub85] „Profesor Józef Modelski - Doktor Honoris Causa Wojskowej Akademii Technicznej im. Jarosława Dąbrowskiego" (Professor Józef Modelski – Military University of Technology – Honorary Doctorate), praca zbiorowa, *Wyd. WAT* (2011), 65 pp.

[Pub86] R. Z. Morawski: „Wydział w perspektywie historycznej" (The Faculty in Historical Perspective), in: R. Z. Morawski (Ed.),

Wydział Elektroniki i Technik Informacyjnych Politechniki Warszawskiej na progu XXI wieku, 2001–2011, *Zbiór esejów pod redakcją Romana Z. Morawskiego, wydany z okazji Jubileuszu Sześćdziesięciolecia Wydziału Elektroniki i Technik Informacyjnych Politechniki Warszawskiej* (Faculty of Electronics and Information Technology, on the verge of the XXIst Century, Book of essays, published on the occasion of the 60th Anniversary of the Faculty of Electronics and Information Technology). *Oficyna Wydawnicza PW* (Warsaw University of Technology Press) (Warsaw 2011), ISBN 978-83-7207-969-5, pp. 5–38.

[Pub87] K. Zaremba, R. Romaniuk: "Inżynieria biomedyczna i jądrowa" (Biomedical and Nuclear Engineering), in: R. Z. Morawski (Ed.), *Wydział Elektroniki i Technik Informacyjnych Politechniki Warszawskiej na progu XXI wieku, 2001–2011*, *Zbiór esejów pod redakcją Romana Z. Morawskiego, wydany z okazji Jubileuszu Sześćdziesięciolecia Wydziału Elektroniki i Technik Informacyjnych Politechniki Warszawskiej* (Faculty of Electronics and Information Technology, on the verge of the XXIst Century, Book of essays, published on the occasion of the 60th Anniversary of the Faculty of Electronics and Information Technology). *Oficyna Wydawnicza PW* (Warsaw University of Technology Press) (Warsaw 2011), ISBN 978-83-7207-969-5, pp. 191-204.

6.3. Scientific and technical papers in conference proceedings

[Pub88] T. Adamski, P. Bilski, W. Winiecki: „Zastosowanie kwantowej kryptografii opartej na położeniu w bezpiecznym systemie pomiarowym", (The Use of Quantum Cryptography based on the Position in Secure Measurement System), *Mat. IX Szkoły-Konferencji „Metrologia Wspomagana Komputerowo" MWK'2011* (Waplewo, Poland, May, 24-27, 2011), on CD-ROM, pp. 1-4.

[Pub89] M. Alqarni, Y. Arabi, T. Kakiashvili, M. Khedr, W. W. Koczkodaj, J. Leszek, A. Przelaskowski, K. Rutkowski: "Improving the Predictability of ICU Illness Severity Scales", *Proc IEEE Federated Conference on Computer Science and Information Systems (FedCSIS)* (Szczecin, Poland, Sept. 18-20, 2011), pp. 11-17.

[Pub90] B. Bielawski, P. Nykiel: "Synchroniczny konwerter częstotliwości próbkowania i rekwantyzator do zastosowań studyjnych - iSRC" (iSRC – Studio-Grade Quality Synchronous Sample Rate Converter and Requantizer), *Proc. 14th International Symposium on Sound Engineering and Tonmeistering* (Wrocław, Poland, May 19-21, 2011), pp. 21-24.

[Pub91] P. Bilski, R. Łukaszewski, K. Mroczek: „Implementation of Measurement Applications Using Flexible Hardware", *Proc. 6th IEEE Int. Conf. on Intelligent Data Acquisition and Advanced Computing Systems: Technology and Applications - IDAACS' 2011* (Prague, Czech Republic, Sept.15--17, 2011), pp. 678-683.

[Pub92] P. Bilski, W. Winiecki, T. Adamski: "Implementation of Symmetric Cryptography in Embedded Systems for Secure Measurement Systems", *Proc. IEEE I2MTC* (Hangzou, China, May 10-12, 2011), pp. 1288-1293.

[Pub93] P. Bobiński, M. Ratyński: "Cyfrowy mikser audio wykorzystujący uniwersalny interfejs WE/WY dla procesora SHARC" (The Digital Audio Mixer based on Universal I/O Interface for SHARC Processor), *Proc. 14th International Symposium on Sound Engineering and Tonmeistering* (Wrocław, Poland, May 19-21, 2011), pp. 15-20.

[Pub94] M. Bury J. Modelski, S. Kozłowski, Y. Yashchyshyn: "Ambiguity in the Definition of Ultra-Wideband Microwave Imaging Systems' Resolution" *Proc. Microwaves, Radar and Remote Sensing Symposium: MRRS-2011* (Kiev, Ukraine Aug. 25-27, 2011), pp. 101-104.

[Pub95] M. Celuch, M. Sypniewski, "QuickWave Electromagnetic Software with CAD Input and GPU Processing", *Proc. 2011 IEEE MTT-S Int. Microwave Symp. - Microwave Application & Product Seminars*, (Baltimore, USA, Jun 7-9, 2011), on CD, also see life recording at https://ieeetv.ieee .org/player/html/viewer#microa-pps-quickwave-electro-magnetic-software-with-cad-input-and-gpu-processing).

[Pub96] P. Czernik, W. Winiecki: „Infrastruktura klucza publicznego do zastosowań w bezpiecznych Rozproszonych Systemach Pomiarowo – Sterujących" (Public Key Infrastructure for Use In Secure Distributed Measurement and Control Systems), *Mat. IX Szkoły-Konferencji „Metrologia Wspomagana Komputerowo" MWK'2011* (Waplewo, Poland, May 24-27, 2011), on CD-ROM, pp. 1-8.

[Pub97] M. Darmetko: „Analiza możliwości implementacji bloku modulatora systemu" (Analysis of the Possibilities of the DVB-T Modulator's Implementation Using FPGA Structures), *Mat. XII Seminarium Radiokomunikacja i Techniki Multimedialne* (Proc. XIIth Seminar: Radiocommunications and Mulmedia Technology) (Warsaw, Poland, Dec. 7, 2011), pp. 107-114.

[Pub98] M. Gasztold: „Trójantenowy interferometr mikrofalowy na pasmo L zrealizowany w technice linii wielowarstwowych" (Tri--antenna L-Band Interferometer Realized in the Multilayer Technique), *Mat. XII Seminarium Radiokomunikacja i Techniki Multimedialne* (Proc. XIIth Seminar: Radiocommunications and Mulmedia Techno-

logy) (Warsaw, Poland, Dec. 7, 2011), pp. 93-98.

[Pub99] K. Grymuza, P. Miazga, K. Goszczyński: „Computer Cloud as Dynamic Infrastructure for Evolutionary Computation in a Secure, Cheap and Efficient Way", *Proc. XIIIth National Conference on Evolutionary Computation and Global Optimization 2011* (Warsaw, Poland, Sept. 21-22, 2011), pp. 1-5.

[Pub100] W. K. Gwarek, M. Olszewska: "Improvement of Accuracy of Extraction of Radiation Patterns from FDTD Modelling of Axisymmetrical Antennas", *Proc. 8th Intl. Conf. on Computation in Electromagnetics CEM-2011* (Wroclaw, Poland, Apr. 11-14, 2011), P1-04, pp. 8-9.

[Pub101] W. K. Gwarek, M. Celuch: "Review of HF and Coupled Problems", *Proc. 8th Intl. Conf. on Computation in Electromagnetics CEM-2011* (Wroclaw, Poland, Apr. 11-14, 2011), O3-2, 87 pp. (also see life recording at http://kn.theiet.org/communities/electromagnetics/cem/cem2011-iet-tv.cfm).

[Pub102] M. Jędryka: *"Wyznaczanie mapy głębi sceny w technice światła strukturalnego"* (Evaluation of 3 Dimensional Scene in Structured Light Technique), *Mat. XII Seminarium Radiokomunikacja i Techniki Multimedialne* (Proc. XIIth Seminar: Radiocommunications and Mulmedia Technology) (Warsaw, Poland, Dec. 7, 2011), pp. 9-16.

[Pub103] C. Jezierski, J. Modelski: „FPGA Transceiver for Space Environment", *Proc. IEEE Africon 2011* (Sept. 13-15, 2011), on CD-ROM, 4 pp.

[Pub104] M. Kłos, W. T. Smolik: "Single Channel Electrical Capacitance Tomograph for Dynamic Process Visualization", *Proc. 2011 IEEE International Conference on Imaging Systems and Techniques (IST 2011)* (Batu Feringhi, Penang, Malaysia May 17-18, 2011), pp. 176-205.

[Pub105] J. Kołakowski: "Application of Quadrature Mixing for I-UWB Signal Spectrum Shaping", *Proc. 2011 IEEE International Conference on Ultra-Wideband (ICUWB)* (Bologna, Italy, Sept. 14-16, 2011), pp. 303-306.

[Pub106] J. Kołakowski: "Application of Ultra-Fast Comparator for UWB Pulse Time of Arrival Measurement", *Proc. 2011 IEEE International Conference on Ultra-Wideband (ICUWB)* (Bologna, Italy, Sept. 14-16, 2011), pp. 470-473.

[Pub107] P. Konczak, M. Sypniewski: "GPU Accelerated Multiplatform FDTD Simulator", *Proc. 8th Intl. Conf. on Computation in Electromagnetics CEM-2011* (Wroclaw, Poland, Apr. 11-14, 2011), P5-04, pp. 168-169.

[Pub108] P. Kopyt, D. Gryglewski, W. Wojtasiak, W. Gwarek: „Charakteryzacja elektryczna ceramicznej oprawki tranzystora RF" (Electrical Characterization of a RF Transistor Package), *Mat. X Krajowej Konferencji Elektroniki* (Proc. Xth National Conference on Electronics) (Darłówko Wschodnie, Poland, Jun. 5-9, 2011), pp. 82-86.

[Pub109] P. Kopyt, A. Bielski: "A Simple 5.8 GHz RFID Wireless Data Transmission System: a Comparison of Two Realizations", *Proc. European Microwave Week* (Manchester, UK, 9-14 Oct. 2011), pp. 1-4.

[Pub110] P. Kopyt, W. Gwarek: "Modeling of Antennas for THz Radiation Detectors", *Proc. GDR-I Workshop* (Tigne, France, Mar. 29 - Apr. 1, 2011), pp.1-5.

[Pub111] R. Korycki: "Badanie autentyczności skomprymowanych nagrań fonicznych" (Research on Autentication of Compressed Audio Recordings) *Proc. 14th International Symposium on Sound Engineering and Tonmeistering* (Wrocław, Poland, May 19--21, 2011), pp. 11-14.

[Pub112] P. Korpas, M. Celuch: "Efektywne wykorzystanie energii elektrycznej w kuchenkach mikrofalowych domowego użytku" (Efficient Use of Electricity in Household Microwave Ovens), *Proc. The Intl. Conf.: Sustainable Production and Consumption of Mineral Resources – Integrating EU's Social Agenda and Resource Efficiency* (Wrocław, Poland, Oct. 2011), pp. 1-5.

[Pub113] E. Kozłowski, J. Żera, R. Młyński: „Attenuation of Instrumental Sounds by Chair Mounted Screen for Musicians," *Proc.The 58th Open Seminar on Acoustics joint with 2nd Polish-German Structured Conference on Acoustics* (Gdańsk-Jurata, Poland, Sept. 13-16, 2011), vol. I, pp. 393-400.

[Pub114] E. Kozłowski, J. Żera, P. Górski, R. Młyński: „Skuteczność tłumienia ustroju akustycznego dla muzyków" (Attenuation of an Acoustic Screen for Musicians), *Mat. XXXIX Zimowej Szkoły Zwalczania Zagrożeń Wibroakustycznych* (Proc. XXXIX Winter School on Vibration Control) (Gliwice-Szczyrk, Poland, Feb. 28-Mar. 4, 2011), pp. 4-9.

[Pub115] A. Krajewski, K. Kozyra, A. Wójcik, P. Witomski, B. Andres, P. Bobiński: „The Use of Electro-Acoustics in the Evaluation of Effectiveness of Old House Borer Controlling in Wood with P-Dichlorobenzene, *Proc. Inter. Scientific Conf. of Students, Masters, Post-graduate Students, Doctoral Candidates and Young Scientists* „*State and Development Perspectives of Woodworking*" (Lviv, Ukraine, May 17-18, 2011), pp. 114-117.

[Pub116] A. Krajewski, P. Witomski, A. Wójcik, M. Nowakowska, P. Bobiński, Z. Kulka: „Electroacoustic Signals as the Detection Method of Wood Boring Insects in Constructions", *Proc. Vedecká Konferencia s Medzianárodnou Účast'ou* (Terchová, Czech Republic, Jun. 2-3, 2011), pp. 1-4.

[Pub117] J. Krupka, M. Sołtysiak: "Measurements of Electromagnetic Properties of Materials at Microwave Frequencies", *Proc. 13th Seminar "Computer Modeling in Microwave Engineering & Applications" - Advances in Determining Material Parameters* (Thun, Switzerland, Mar. 7-8, 2011), pp. 1-6.

[Pub118] Z. Kulka: "Sampling Jitter in Audio A/D Converters", *Proc. 14th International Symposium on Sound Engineering and Tonmeistering* (Wrocław, Poland, May 19-21, 2011), pp. 5-10.

[Pub119] M. Lewandowski: "Opracowanie wersji cyfrowego instrumentu muzycznego" (Developing Digital Version of a Musical Instrument), *Proc. 14th International Symposium on Sound Engineering and Tonmeistering* (Wrocław, Poland, May 19-21, 2011), pp. 1-4.

[Pub120] M. Lewandowski: "Metody optymalizacji parametrów cyfrowych modulatorów sigma-delta fonicznych przetworników c/a" (Optimization Methods for Digital Sigma-delta Audio DAC), *Mat. XII Seminarium Radiokomunikacja i Techniki Multimedialne* (Proc. XII*th* Seminar: Radiocommunications and Mulmedia Technology) (Warsaw, Poland, Dec. 7, 2011), pp. 17-25.

[Pub121] R. Łukaszewski, P. Bilski, K. Mroczek: „Wykorzystanie rekonfigurowalnych przyrządów pomiarowo-sterujących i systemów wbudowanych w dydaktyce" (The Use of Reconfigurable Control Measurement Devices and Embedded Systems), *Mat. IX Szkoły-Konferencji „Metrologia Wspomagana Komputerowo" MWK'2011* (Waplewo, Poland, May 24-27, 2011), on CD-ROM, pp.1-6.

[Pub122] M. Markowski-Klocek: „Projekt układu kryptograficznego dla strumienia transportowego zgodnego ze standardem MPEG2" (Design of the Cryptographic System for the MPEG-2 Transport Stream), *Mat. XII Seminarium Radiokomunikacja i Techniki Multimedialne* (Proc. XII*th* Seminar: Radiocommunications and Mulmedia Technology) (Warsaw, Poland, Dec. 7, 2011), pp. 115-122.

[Pub123] P. Marszał: „Radiowysokościomierz lotniczy pracujący z falą ciągłą zmodulowaną częstotliwościowo" (The Aviation Continuous Wave Altimeter), *Mat. XII Seminarium Radiokomunikacja i Techniki Multimedialne* (Proc. XII*th* Seminar: Radiocommunications and Mulmedia Technology) (Warsaw, Poland, Dec. 7, 2011), pp. 99-106.

[Pub124] P. Miazga: "Building Blocks Concept in Topological Synthesis of a Tree Shaped Structures", *Proc. XIII th National Conference on Evolutionary Computation and Global Optimization 2011* (Warsaw, Poland, Sept. 21-22, 2011), pp. 1-6.

[Pub125] P. Miazga: "A New Topology for Ultra-wideband Directional Couplers", *Proc. 8th Intl. Conf. on Computation in Electromagnetics CEM-2011* (Wrocław, Poland, Apr. 11-14, 2011), P3-04, pp. 94-95.

[Pub126] M. Mikołajewski: "Wzmacniacz klasy E z regulacją mocy wyjściowej metodą grup impulsów" (A Class E Amplifier with Burst Output Power Control), *Mat. X Krajowej Konferencji Elektroniki* (Proc. X*th* National Conference on Electronics) (Darłówko Wschodnie, Poland, Jun. 5-9, 2011), pp. 188-192.

[Pub127] R. Młyński, J. Żera, E. Kozłowski: „Ocena skuteczności ochronników słuchu w ograniczaniu hałasu impulsowego występującego w przemyśle" (Assessment of Hearing Protector Effectiveness in Industrial Noise Attenuation), *Proc 58th Open Seminar on Acoustics Joint with 2nd Polish--German Structured Conference on Acoustics* (Gdańsk-Jurata, Poland, Sept. 13-16, 2011), vol. I, pp. 401-406.

[Pub128] J. Modelski, T. Kosiło, T. Keller: „Wyzwania stojące przed polską koleją w związku z wdrażaniem aplikacji telematycznych", (The Challenges for the Polish Railway due to the Implementation of Telematics Applications), *Mat. V Konferencji Naukowo--Technicznej: Otwarty Rynek Kolejowy w Polsce* (Proc. V*th* Scientific Conference: Open Railway Market in Poland) (Warsaw, Poland, Dec. 16, 2011), pp. 1-4.

[Pub129] J. Modzelewski, K. Kulma: "Udoskonalona metoda obliczania obwodów typu π1 do rezonansowych wzmacniaczy mocy" (Improved Method of Estimation π1 Circuits for Tuned Power Amplifiers), *Mat. X Krajowej Konferencji Elektroniki* (Proc. X*th* National Conference on Electronics), (Darłówko Wschodnie, Poland, Jun. 5-9, 2011), pp. 164-169.

[Pub130] R. Z. Morawski: „Application-oriented Approach to Mathematical Modelling of Measurement Processes", *Proc. Joint International IMEKO TC1+TC7+TC13 Symposium* (Jena, Germany, Aug. 31 - Sept. 2, 2011), 11 pp.

[Pub131] K. Nogajewski, H. Boukari, P. Kopyt, W. Gwarek, T. Wojtowicz, H. Mariette, M. Grynberg, J. Lusakowski: "Antenna--equipped Field Effect Transistiors on CdTe /CdMgTe Quantum Wells as Terahaertz Detectors", *Proc. 40th "Jaszowiec" 2011 Intl. School and Conference on the Physics of Semiconductors* (Krynica Górska, Poland, Jun. 25- Jul. 1, 2011), pp. 1-4.

[Pub132] J. Olszyna, W. Winiecki: „Niskomocowa realizacja algorytmu mnożenia modularnego Montgomery'ego dla rozproszonych systemów pomiarowo-sterujących" (Low--power Implementation of Montgomery Modular Multiplication Algorithm for Distributed Measurement and Control Systems), *Mat. IX Szkoły-Konferencji „Metrologia Wspomagana Komputerowo" MWK'2011* (Waplewo, Poland, May 24-27, 2011), on CD-ROM, pp. 1-3.

[Pub133] J. Olszyna, W. Winiecki: „Low-Power Modular Reduction in GF(2^m) for Sensor Networks", *Proc. 6th IEEE Int. Conf. on Intelligent Data Acquisition and Advanced Computing Systems: Technology and Applications - IDAACS'2011* (Prague, Czech Republic, Sept. 15-17, 2011), pp. 351-355.

[Pub134] D. Piętak, J. Wojciechowski, P. J. Napiórkowski: „A Front Line Algorithm for Error Estimation in Data Sets with Nonuniform Sampling Distribution", *Proc. 20th European Conference on Circuit Theory and Design (ECCTD)* (Linköping, Sweden, Aug. 29-31, 2011, pp. 210-213.

[Pub135] L. Raczyński, Z. Czekała: „Detection of the Radar Echo from the Helicopter Rotor", *Proc. Signal Processing Symposium* (Jachranka Village, Poland, Jun. 8-10, 2011), pp. 1-6.

[Pub136] S. Rosłoniec: "The Fundamental Iterative Methods to Solve Systems of Nonlinear Equations", *Proc. The World Conference on Engineering and Computer Science* (San Francisco, USA, Oct. 19-21, 2011), pp. 1-4.

[Pub137] J. Rudnicki, M. Sypniewski: "Amelet-HDF Converters for Computational Electromagnetics in Aeronautic Projects", *Proc. 8th Intl. Conf. on Computation in Electromagnetics CEM-2011* (Wroclaw, Poland, Apr. 11-14. 2011), P5-03, pp. 166-167.

[Pub138] B. Salski, M. Celuch: "Electromagnetic Modeling of Inhomogeneous Composites with Conductive Inclusions", *Proc. 13th Seminar "Computer Modeling in Microwave Engineering & Applications" - Advances in Determining Material Parameters* (Thun, Switzerland, Mar. 7-8, 2011), pp. 30-35.

[Pub139] B. Salski, M. Celuch: "The Debye Rigorous Equivalent of the Maxwell-Garnett Mixing Rule for Effective Modeling of Carbon Suspensions under MW Irradiation", *Proc. 2011 IEEE MTT-S Int. Microwave Symp.* (Baltimore, USA, 7-9 Jun. 2011), WE4C-1 (on CD or http://ieeexplore.ieee.org/stamp.jsp?tp=&arnumber=5972797).

[Pub140] B. Salski, M. Celuch, M. Sołtysiak, C. Pettersson, U. Rudberg, Z. Fołtynowicz, R. Johansson: "Food Waste Treatment on Ships by Microwave Drying", *Proc. 13th International Conference on Microwave and High Frequency Heating AMPERE*, (Toulouse, France, Sept. 5-8, 2011), pp. 435-438.

[Pub141] B. Salski, W. Gwarek, M. Celuch: "Semi-analytical FDTD Modeling of Axisymmetrical and Periodic Structures", *Proc. 21st Intl. Conf. Radioelektronika 2011*, (Brno, Czech Republic, Apr. 2011), pp. 21--23.

[Pub142] F. Schuster, P. Kopyt, P. Łukasik, W. Gwarek, D. Coquillat, F. Teppe, B. Giffard: "Terahertz Detectors based on Low Cost 130 nm Silicon Field Effect Transistors", *Proc. 40th Jaszowiec 2011 Intl. School and Conference on the Physics of Semiconductors* (Krynica Górska, Poland, Jun. 25-Jul. 1, 2011), pp. 1-4.

[Pub143] W. T. Smolik, M. Kłos, R. Szabatin: "Single-Shot Charge-Discharge Circuit for Dynamic Electrical Capacitance Tomography", *Proc. 7th International Symposium on Measurement Techniques for Multiphase Flows: ISMTMF'2011* (Tianjin, China, Sept. 17-19, 2011), pp. 1-4.

[Pub144] W. T. Smolik, R. Szabatin: "Non-Invasive Imaging of Dynamic Processes in Air-Lift Chemical Reactor Using Electrical Capacitance Tomograph", *Proc.* 4th *International Workshop on Process Tomography (IWPT-4*) (Chengdu, China, Sept. 21-22, 2011), pp. 1-6.

[Pub145] W. T. Smolik, D. Radomski: "An Application of a Regular Square Mesh in a Forward Problem Solver in Electrical Capacitance Tomography", *Proc. 2011 IEEE International Conference on Imaging Systems and Techniques: IST 2011* (Batu Feringhi, Penang, Malaysia, May 17-18, 2011), pp. 104-107.

[Pub146] K. Snopek: "The n-D Analytic Signals and Fourier Spectra in Complex and Hypercomplex Domains", *Proc. IEEE 34th International Conference on Telecommunications and Signal Processing* (Budapest, Hungary, Aug. 18-20, 2011), pp. 423-427.

[Pub147] M. Sołtysiak, M. Celuch: "Influence of Dielectric Properties on the Accuracy of the Simulation of Microwave Heating", *Proc. 13th Seminar "Computer Modeling in Microwave Engineering & Applications" - Advances in Determining Material Parameters*, (Thun, Switzerland, Mar. 7-8, 2011), pp. 47-52.

[Pub148] M. Sołtysiak, M. Celuch, U. Erle: "Coupling between FDTD Electromagnetic and FEM CFD Software Packages for Simulation of Microwave Heating", *Proc. 8th Intl. Conf. on Computation in Electromagnetics CEM--2011* (Wroclaw, Poland, Apr. 11-14, 2011), P4-04, pp. 128-129.

[Pub149] M. Sołtysiak, M. Celuch, U. Erle: "Measured and Simulated Frequency Spectra of the Household Microwave Oven", *Proc. 2011 IEEE MTT-S Intl.Microwave Symp.*, (Baltimore, USA, Jun. 7-9, 2011), WEPS-2 (on CD or see life recording at http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5972844).

[Pub150] M. Sołtysiak, B. Salski, M. Celuch: "Simulation of Microwave Heating of Static Objects with Low Dielectric Losses", *Proc. 13th International Conference on Microwave and High Frequency Heating AMPERE*, (Toulouse, France, Sept. 5-8, 2011), pp. 363-366.

[Pub151] K. Sorokosz: "Szyfrowanie danych multimedialnych transmitowanych z wykorzystaniem protokołu RTP" (Encryption

Multimedia Data Transmitted using the RTP Protocol), *Mat. XII Seminarium Radiokomunikacja i Techniki Multimedialne* (Proc. XIIth Seminar: Radiocommunications and Mulmedia Technology) (Warsaw, Poland, Dec. 7, 2011), pp. 43-48.

[Pub152] A. Świercz, J. Żera: „An Application of Gammatone Filter to MPEG-7 Sound Indexing," *Proc. the 58th Open Seminar on Acoustics Joint with 2nd Polish-German Structured Conference on Acoustics* (Gdańsk--Jurata, Poland, Sept. 13-16, 2011), vol. II, pp. 317-322.

[Pub153] A. Urzędowska, R. Jaworski: „Dwukierunkowa transmisja w sieciach RoF" (Bidirectional Transmission in RoF Systems), *Mat. XXX Konferencji Elektroniki i Telekomunikacji Studentów i Młodych Pracowników Nauki: SECON 2011* (Warsaw, Poland, Mar. 22-24, 2011), on CD-ROM, 4 pp.

[Pub154] A. Urzędowska, Y. Yashchyshyn: „A Full--duplex Photonic RAU for RoF Systems", *Proc. European Wireless 2011* (Vienna, Austria, Apr. 27-29, 2011), pp. 605-609.

[Pub155] J. Walecki, K. Sklinda, A. Przelaskowski, M. Mol, T. Bulski: "A CAD System for Improving the Diagnostic Value of Computed Tomography in the Setting of Hyperacute Stroke", *Proc. 97th Acientific Assembly and Annual Meeting of the Radiological Society of North America RSNA* (Chicago, USA, Nov. 27-Dec. 2, 2011), pp. 1-6.

[Pub156] W. Winiecki, P. Zawistowski: „Project Management Methodology for Measurement and Control Systems", *Proc. 6th IEEE Int. Conf. on Intelligent Data Acquisition and Advanced Computing Systems: Technology and Applications - IDAACS'2011* (Prague, Czech Republic, Sept. 15-17, 2011), pp. 927-932.

[Pub157] P. Wróblewski, J. Szyszko, W. T. Smolik: "Mandhala Magnet for Ultra Low-Field MRI", *Proc. 2011 IEEE International Conference on Imaging Systems and Techniques (IST 2011)* (Batu Feringhi, Penang, Malaysia, May 17-18, 2011), pp. 248-252.

[Pub158] Y. Yashchyshyn, A. Urzędowska, A. Chizh, S. Malyshev, J. Modelski: „Integrated Photonic Antenna Unit for Dual WLAN Band Applications", *Proc. the 5th European Conference on Antennas and Propagation: EuCAP 2011* (Rome, Italy, Apr. 11-15, 2011), pp. 220-222.

[Pub159] P. Ziętek: "Zmodyfikowana metoda wyznaczania różnicy czasów propagacji sygnałów impulsowych z liniową modulacją częstotliwości" (Improved Method of TDOA Estimation with Chirp Signals), *Mat. XII Seminarium Radiokomunikacja i Techniki Multimedialne* (Proc. XIIth Seminar: Radiocommunications and Mulmedia Technology) (Warsaw, Poland, Dec. 7, 2011), pp. 51-58.

[Pub160] P. Ziętek, J. Kołakowski, J. Modelski: „Improved Method for TDOA Estimation with Chirp Signals", *Proc. 41st IEEE European Microwave Conference: EuMC* (Manchester, UK, Oct. 10-13, 2011), pp. 83-86.

[Pub161] M. Zyskowski: „Implementacja sprzętowa transformat standardu H.265" (Hardware Implementation of H.265 Transforms), *Mat. XII Seminarium Radiokomunikacja i Techniki Multimedialne* (Proc. XIIth Seminar: Radiocommunications and Mulmedia Technology) (Warsaw, Poland, Dec. 7, 2011), pp. 27-33.

6.4 Textbooks

[Pub162] A. Przelaskowski: „Techniki multimedialne", (Multimedia Technologies), *Warsaw University of Technology Distant Learning Center – OKNO* (Ośrodek Kształcenia na Odległość Politechniki Warszawskiej – OKNO) (2011), 410 pp.

6.5 Abstracts and Posters

[Pub163] P. Korpas, M. Celuch: "New Approach to Effective Use of Energy in Microwave Ovens", *Mat. Konferencji: Zrównoważona Produkcja i Konsumpcja Surowców Mineralnych w Europie – Integracja Aspektów Społecznych i Racjonalnego Zużycia Zasobów"* (Proc. Conf.: Sustainable Production and Consumption of Mineral Resources in Europe – Integrating the EU's Social Agenda and Resource Efficiency) (Wrocław, Poland, Oct. 20-22, 2011), 1 p.

[Pub164] R. Z. Morawski, A. Miękina: „A Method of Weighing Matrix for Spectrometric Analysis of Oil Mixtures" (extended abstract), *Proc. Conf. AMCTM 2011* (Göteborg, Sweden, Jun. 20-22, 2011), 2 pp.

[Pub165] M. Nesteruk, J. Karczmarski, T. Rubel, M. Mikuła, A. Dzwonek, A. Paziewska, M. Dadlez, E. E. Henning, J. Ostrowski: „High Throughput Quantitative Proteomic Workflow for Analysis of Liver Mitochondrial Proteome in Mouse Models of Obesity", *Proc. 2nd Congress of Biochemistry and Cell Biology* (Kraków, Poland, Sept. 5-9, 2011), 1 pp

7. REPORTS AND PATENTS

[Rep1] P. Bilski: *„Zastosowanie metod sztucznej inteligencji w diagnostyce systemów analogowych”* (Application of the Artificial Intelligence Applications in the Diagnostics of Analog Systems), Final report for the Dean grant, Institute of Radioelectronics, WUT, Warsaw, Dec. 2011.

[Rep2] P. Bogorodzki, E. Piątkowska-Janko: *„Badania czynnościowe fMRI chorych usprawnianych po udarze mózgu”* (A fMRI Study of the Patients Recovering from the Stroke), Final report for the MSHE grant, Institute of Radioelectronics, WUT, Warsaw, Sept. 2011.

[Rep3] M. Bury: *„Obrazowanie obiektów na częstotliwościach subterahercowych”* (Sub-terahertz Imaging), Final report for the Dean grant, Institute of Radioelectronics, WUT, Warsaw, Dec. 2011.

[Rep4] J. Cichocki, J. Kołakowski, R. Michnowski, K. Radecki, W. Kiełek, S. Żmudzin, P. Makal, P. Ziętek: *“Techniki transmisji informacji w ultraszerokopasmowych systemach lokalizacyjnych”* (The Data Transfer Techniques in UWB Localization Systems), Final report for the statutory grant, Institute of Radioelectronics, WUT, Warsaw, Dec. 2011.

[Rep5] W. Gwarek, P. Kopyt: *„Zaprojektowanie i wykonanie detektora promieniowania sub-THz działającego w oparciu o krzemowy tranzystor MOS”* (Design and Manufacturing of a sub-THz Radiation Detector based on MOS Transistor), Final report for the development grant, Institute of Radioelectronics, WUT, Warsaw, Dec. 2011

[Rep6] W. Gwarek, T. Morawski, S. Rosłoniec, M. Celuch, D. Gryglewski, M. Sypniewski, A. Więckowski, P. Kopyt, P. Miazga, W. Wojtasiak, J. Zborowska, K. Robaczyński, B. Salski, D. Rosołowski, M. Lubiejewski: *„Współczesne metody analizy i projektowania układów wielkiej częstotliwości”* (Modern Methods of Modelling and Designing for High Frequency Systems), Final report for the statutory grant, Institute of Radioelectronics, WUT, Warsaw, Dec. 2011.

[Rep7] S. L. Hahn, K. M. Snopek: „Quasi-analytic Multidimensional Signals“, Internal report, no. 1, Institute of Radioelectronics, WUT, Warsaw, Oct. 2011.

[Rep8] K. Ignasiak, W. Skarbek, A. Buchowicz, G. Galiński, G. Pastuszak, R. Sikora, M. Jakubowski, M. Jędryka, M. Leszczyński, J. Naruniec, A. Nowakowski, A. Abramowski, G. Brzuchalski, M. Roszkowski, M. Wieczorek: *„Audiowizualne sieciowe systemy hybrydowe”* (Audiovisual Network Hybrid Systems), Final report for the statutory grant, Institute of Radioelectronics, WUT, Warsaw, Dec. 2011.

[Rep9] T. Kosiło, S. Hahn, T. Buczkowski, K. Czerwiński, J. Jarkowski: *„Współczesne radiowe systemy ruchome – wybrane problemy”* (Modern Radiocommunication Systems – Selected Problems), Final report for the statutory grant, Institute of Radioelectronics, WUT, Warsaw, Dec. 2011.

[Rep10] Z. Kulka, P. Bobiński, E. Kotarbińska, A. Leszczyński, M. Tajchert, M. Lewandowski, J. Żera: *„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, Warsaw, Dec. 2011.

[Rep11] J. Modelski, K. Kurek, T. Keller, S. Kozłowski, K. Bryłka, M. Dąbrowski: *„Metody szacowania zasięgów oraz analizy pojemności i wydajności widmowej systemu radiowych sieci metropolitalnych WiMAX”* (Methods of the Estimation of the Transmission Ranges and Spectrum Effectiveness in the Wireless Metropolitan WiMAX Networks) Final report for the statutory grant, Institute of Radioelectronics, WUT, Warsaw, Dec. 2011.

[Rep12] J. Modzelewski, H. Chaciński, W. Kazubski, M. Mikołajewski: *„Doskonalenie metod projektowania wysokosprawnych wzmacniaczy mocy klasy E i klasy F”* (Improving Design Methods of Resonant Circuits in H.F. Power Amplifier), Final report for the statutory grant, Institute of Radioelectronics, WUT, Warsaw, Dec. 2011.

[Rep13] R. Z. Morawski, A. Miękina, A. Podgórski: *„Interpretacja danych pomiarowych – metodyka i aspekty metametrologiczne”* (Interpretation of Measurement Data – Methodology and Metametrological Aspects), Final report for the statutory grant, Institute of Radioelectronics, WUT, Warsaw, Dec. 2011.

[Rep14] E. Piątkowska-Janko: *„Gamma-kamera hand-held – przenośne urządzenie do pomiaru przestrzennego rozkładu promieniowania gamma”* (Hand-held Gamma-Camera – Portable Gamma Radiation Spatial Distribution Detector), Final report for the Rector grant, Institute of Radioelectronics, WUT, Warsaw, Dec. 2011.

[Rep15] A. Przelaskowski: *„Diagnostyka wczesnego udaru mózgu – rozszerzenia systemu CAD”* (Early Stroke Diagnostics – Extentions of CAD System), Final report for the statutory grant, Institute of Radioelectronics, WUT, Warsaw, Dec. 2011.

[Rep16] A. Przelaskowski, R. Jóźwiak: *„Wieloskalowe metody reprezentacji i opisu treści diagnostycznej w medycznych sekwencjach obrazowych”* (Multiscale Methods of Data Representation and Modeling in Medical Imaging Sequences), Final report for the Ph.D. grant, Institute of Radioelectronics, WUT, Warsaw, Sept. 2011.

[Rep17] W. Smolik, D. Radomski, P. Czarnecki: *“Rekonstrukcja obrazów w tomografii elektrycznej za pomocą ulepszonych algorytmów optymalizacji nieliniowej”* (Image

Reconstruction in Electrical Tomography by Enhanced Nonlinear Optimization Algorithms), Final report for the MSHE grant, Institute of Radioelectronics, WUT, Warsaw, Oct. 2011.

[Rep18] W. Winiecki, P. Bilski, P. Czernik, R. Łukaszewski, K. Mroczek, J. Olszyna: *„Rozwój metod projektowania stacjonarnych i rozproszonych systemów pomiarowych”* (Development of Stationary and Distributed Measuring Systems Designing), Final report for the statutory grant, Institute of Radioelectronics, WUT, Warsaw, Dec. 2011.

[Rep19] J. Wojciechowski, K. Snopek, D. Piętak, M. Czajko: *„Badania w zakresie rozwoju teorii i zastosowań sygnałów wielowymiarowych oraz heurystycznych metod analizy i projektowania”* (Investigation on Theory and Applications of Multidimensional Signals and Heuristic Methods for Analysis and Design), Final report for the statutory grant, Institute of Radioelectronics, WUT, Warsaw, Dec. 2011.

[Rep20] Y. Yashchyshyn, P. Bajurko: *„Analiza i projektowanie sterowanych anten mikrofalowych”* (Analysis and Design of Steerable Microwave Antennas), Final report for the Rector grant, Institute of Radioelectronics, WUT, Warsaw, Oct. 2011.

[Rep21] Y. Yashchyshyn, K. Derzakowski, M. Bury, P. Bajurko, A. Urzędowska, B. Majewski: *„Metody pomiaru w dziedzinie czasu i w dziedzinie częstotliwości dynamicznych parametrów anten rekonfiguralnych”* (Methods of Dynamic Parameters Measurements of Reconfigurable Antennas in Time- and Frequency-domain), Final report for the statutory grant, Institute of Radioelectronics, WUT, Warsaw, Dec. 2011.

[Rep22] Y. Yashchyshyn, P. Bajurko, M. Bury, A. Skrzypkowski: *„Fotonika i Technologie Terahercowe – Rozwój Wydziałowego Centrum Badawczego – Modernizacja laboratorium antenowego”* (Photonics and Terahertz Technologies – Development of Department Research Center – Antenna Laboratory Modernization), Final report for FOTEH, POIG 2.1, the Innovative Economy Program, Warsaw, Dec. 2011.

[Rep23] K. Zaremba, P. Bogorodzki, P. Brzeski, G. Domański, T. Jamrógiewicz, M. Kazubek, B. Konarzewski, J. Marzec, T. Olszewski, E. Piątkowska-Janko, D. Radomski, W. Smolik, R. Szabatin, R. Kurjata: *“Nowoczesne techniki elektroniki jądrowej i medycznej”* (Modern Techniques in Nuclear and Medical Electronics), Final report for the statutory grant, Institute of Radioelectronics, WUT, Warsaw, Dec. 2011.

[Rep24] K. Zaremba, J. Marzec, M. Dziewiecki, G. Domański, B. Konarzewski, R. Kurjata, M. Ziembicki: *„Eksperyment COMPASS – badanie spinowej struktury nukleonu”* (The COMPASS Experiment – the Research on the Spin Structure of Nucleon), Final report for the COMPASS International project, Jan. 2011.

PATENTS

[Pat1] M. Bury, P. Bajurko, S. Kozłowski: *„Sposób kompensacji błędu podstawy czasu w mikrofalowym wielokanałowym systemie pomiarowym z przetwarzaniem w dziedzinie czasu oraz mikrofalowy wielokanałowy system pomiarowy z przetwarzaniem w dziedzinie czasu”* (A method for compensation of the time base error in time-do-main microwave multichannel measurement system and time-domain microwave multichannel measurement system), Patent application P-396 233, Sept. 5, 2011.

[Pat2] Z. Czekała, L. Raczyński: *„Układ przetwarzania sygnału echa radiolokacyjnego, zwłaszcza do wykrywania śmigłowców”* (Radar echo signal processing system, especially for detecting helicopters), Pattent application P-8737, Jan. 27, 2011.

[Pat3] W. Gwarek, T. Ciamulski: *“Sposób przesyłania sygnałów elektrycznych w wieloprzewodowej linii transmisyjnej”* (The way of sending electrical signals in multi-conductor transmission line), Patent no. 208179, Apr. 4, 2011.

8. SCIENTIFIC EVENTS

8.1. International scientific events

[Con1] *Progress in Electromagnetics Research Symposium: PIERS 2011* (Marrakesh, Morocco, Mar. 20-24, 2011), P. Kopyt (participant).

[Con2] *5th European Conference on Antennas and Propagation: EuCAP 2011* (Rome, Italy, Apr. 11-15, 2011), Y. Yashchyshyn (speaker).

[Con3] *MTT-S China Initiative* (Beijing - Harbin – Chengdu, Apr. 12-18, 2011), J. Modelski (lecturer).

[Con4] *European Wireless 2011* (Vienna, Austria, Apr. 26-30, 2011), Y. Yashchyshyn (participant), A. Urzędowska (speaker).

[Con5] *IEEE EuroCon 2011* (Lisbon, Portugal, Apr. 27-29, 2011), J. Modelski (Honorary Co-Chairmen, Opening Address).

[Con6] *2011 IEEE Instrumentation and Measurement Technology Conference: I2MTC 2011* (Hangzhou, China, May 7-14, 2011), W. Winiecki, P. Bilski (speakers).

[Con7] *130th Audio Engineering Society Convention* (London, UK, May 12-16, 2011), Z. Kulka (participant).

[Con8] *IEEE International Conference on Imaging Techniques 2011* (Penang Batu Ferringi, Malaysia, May 11-14, 2011), W. Smolik (participant).

[Con9] *XXVIIIth IEEE-SPIE Joint Symposium on Photonics, Web Engineering, Electronics for Astronomy and High Energy Physics Experiments* (Wilga Village, Poland, May 23-29, 2011), G. Brzuchalski (speaker).

[Con10] *IEEE MTT Symposium* (Baltimore, USA, Jun. 5-10, 2011), J. Modelski (member of the Technical Paper Review Committee, focus session chair), M. Celuch, W. Gwarek (participants).

[Con11] *European Conference: "Scientific Support to a Competitive European Low Carbon Economy: Energy, Transport and Emerging Technologies", European Commission's Joint Research Centre, RP Ministry of Science and Higher Education, Polish Academy of Sciences* (Warsaw, Poland Jul. 7, 2011), T. Buczkowski (participant).

[Con12] *International Summer School 2011* (Darmstadt, Niemcy, Jul. 9-15, 2011), Y. Yashchyshyn (lecturer), K. Godziszewski, A. Wierzejski (participants).

[Con13] *International Conference on Advanced Mathematical and Computational Tools in Metrology and Testing: AMCTM 2011* (Göteborg, Sweden, Jun. 18-23, 2011), R. Z. Morawski (speaker).

[Con14] *34th International Conference on Telecommunications and Signal Processing: TSP 2011* (Budapest, Hungary, Aug. 18-20, 2011), K. Snopek (speaker).

[Con15] *3rd Microwaves, Radar and Remote Sensing Symposium: MRRS 2011* (Kiev, Ukraine, Aug. 25-27, 2011), J. Modelski (member of the Technical Programme Committee, opening address, session chair, speaker).

[Con16] *European Conference on Circuit Theory and Design* (Linköping, Sweden, Aug. 25 - Sept. 1, 2011), J. Wojciechowski (speaker).

[Con17] *TC1-TC7-TC13 IMEKO Symposium* (Jena, Germany, Aug. 29 - Sept. 4, 2011), R. Z. Morawski (speaker).

[Con18] *13th International Conference on Micro-wave and High Frequency Heating* (Toulouse, France, Sept. 6-9, 2011), M. Olszewska (participant).

[Con19] *IEEE Africon 2011* (Livingstone, Zambia, Sept. 11-17, 2011), C. Jezierski (speaker).

[Con20] *XXX URSI General Assembly and Scientific Symposium* (Istanbul, Turkey, Sept. 13-21, 2011), T. Kosiło (participant).

[Con21] *2011 IEEE International Conference on Ultra-Wideband (ICUWB)* (Bologna, Italy, Sept. 14-16, 2011), J. Kołakowski (speaker).

[Con22] *IEEE IDAACS 2011* (Praha, Czech Republic, Sept. 14-18, 2011), W. Winiecki (member of the IPC, session chair) P. Bilski, J. Olszyna, P. Zawistowski (speakers).

[Con23] *7th International Symposium on Measurement Technique for Multiphase Flows 2011* (Tianjin, China, Sept. 15-20, 2011), W. Smolik (speaker).

[Con24] *Third International Symposium on Dynamic Nuclear Polarization* (Lausanne, Sept.7-10, 2011), P. Bogorodzki (speaker)

[Con25] *36th International Conference on Infrared, Millimeter, and Terahertz Waves: IRMMW-THz 2011* (Houston, USA, Oct. 2-6, 2011), P. Kopyt (speaker).

[Con26] *10th International IFAC Workshop on Programmable Devices and Embedded Systems* (Pszczyna, Poland, Oct. 6-7, 2011), G. Brzuchalski (speaker).

[Con27] *3rd International Students Conference on Electrodynamics and Mechatronics: SCE 2011* (Opole, Oct. 6-8, 2011), J. Modelski (International Scientific Committee member, Honorary Patronage).

[Con28] *14th European Microwave Week* (Manchester, UK, Oct. 9-14, 2011), J. Modelski (EuMC Technical Programme Committee member, session Co-Chair session chair), P. Kopyt, P. Ziętek (speaker).

[Con29] *38th International Conference and Exhibition: PIKE 2011* (Poznań, Poland, Oct. 16-19, 2011), J. Modelski (Program Council Chair, Introduction address), T. Keller (participant).

[Con30] *Perspectives for the Development of the Electronic Communications Market in the EU* (Warsaw, Poland, Oct. 19-20, 2011), J. Modelski (participant).

[Con31] *4th International Intellectual Property Management Forum* (Warsaw, Poland, Oct. 26-29, 2011), J. Modelski (panel discussion member).

[Con32] *5th International Forum Science & Technology Days Poland-East, and Special Forum & Exhibition on Best of East – for Easter Partnership: Challenges and Opportunities for Collaboration European Union-Poland-Eastern Europe Countries* (Warsaw, Poland, Nov. 28-30, 2011), K. Zaremba – chair of the Programme Committee, G. Domański, B. Konarzewski (participants).

[Con33] Federated Conference on Computer Science and Information Systems (Szczecin, Poland, Sept. 18-21, 2011), K. Zaremba (member of the Programme Committee of the "Ubiquitous Home Healthcare - UHH" workshop).

8.2. National scientific events

[Con34] *Konferencja Naukowo-Techniczna "Auto matyzacja - Nowości i Perspektywy" AUTOMATION '11* (Conference on Automation-Innovation and Future Prospectives AUTOMATION' 11) (Warsaw, Poland, Apr. 6-8, 2011), W. Winiecki (invited speaker).

[Con35] *Ogólnopolska Konferencja Operatorów Komunikacji Elektronicznej* (Jachranka, May 23-25, 2011), J. Modelski, (Program Council Chair), J. Cichocki, M. Dąbrowski, A. Buchowicz, M. Kalbarczyk, T. Keller, R. Maksimiuk, Ł. Nowak (speakers).

[Con36] *IX Szkoła/Konferencja "Metrologia Wspomagana Komputerowo" - MWK 2011* (IXth School/Conference "Computer-aided Metrology" - MWK 2011) (Waplewo, Poland, May 24-27, 2011), W. Winiecki (member of the Scientific Committee, session chairman), R. Z. Morawski (member of the Scientific Committee, invited speaker), R. Łukaszewski, J. Olszyna.

[Con37] *X Krajowa Konferencja Elektroniki* (Xth National Conference on Electronics) (Darłówko Wschodnie, Poland, Jun. 5-9, 2011), P. Kopyt, M. Mikołajewski, J. Modzelewski (speakers).

[Con38] *Krajowa Konferencja Radiokomunikacji, Radiofonii i Telewizji: KKRRiT 2011* (National Conference on Radiocommunications and Broadcasting), (Poznań, Poland, Jun. 8-10, 2011), J. Cichocki, Y. Yashchyshyn (members of the Programme Committee), P. Bajurko, A. Buchowicz, J. Jarkowski, K. Godziszewski, M. Kalbarczyk, W. Kazubski, T. Keller, J. Kołakowski, S. Kozłowski, K. Kurek, P. Makal, R. Maksimiuk, R. Michnowski, J. Naruniec, D. Nielipińska, Ł. Nowak, K. Radecki, A. Urzędowska, P. Ziętek, (speakers), M. Kalinowska, A. Mundzik (participants).

[Con39] *Krajowe Sympozjum Telekomunikacji I Teleinformatyki: KSTiT 2011* (Łódź, Poland, Sept. 14-16, 2011), J. Modelski (member of the Program Committee, Welcome Address), invited paper.

[Con40] *XII Seminarium: Radiokomunikacja I Techniki Multimedialne* (XIIth Seminar: Radiocommunications and Multimedia Technologies) (Warsaw, Poland, Dec. 7, 2011), M. Darmetko, M. Gasztold, M. Jędryka, M. Lewandowski, P. Marszał, P. Ziętek (speakers).

[Con41] *Konferencja Naukowo-Techniczna: Otwarty Rynek Kolejowy w Polsce* (Vth Scientific Conference: Open Railway Market in Poland) (Warsaw, Poland, Dec. 16, 2011), J. Modelski (member of the Program Committee), T. Keller, T. Kosiło (participants).

9. AWARDS AND DISTINCTIONS

Doctor Honoris Causa (Honorary Doctorate) for extraordinary achievements in the fields of radioelectronics **-** Military University of Technology
Józef Modelski, Prof. D.Sc.

State Medals

Marek Rusin, Ph.D.,
Krzyż Oficerski Orderu Odrodzenia Polski (Oficer's Cross of the Order of Rebirth of Poland)

Maria Tajchert, Ph.D.,
Jacek Jarkowski, Ph.D.
Medal Złoty za Długoletnią Służbę (Golden Medal for Long-lasting Service).

Władysław Skarbek, Prof. D.Sc.,
Roman Szabatin, Ph.D.,
Medal Komsji Edukacji Narodowej (Medal of National Education Committee).

IEEE Microwave Theory and Technology Society Pioneer Award

„In recognition of pioneering contributions to the development and practical use of the finite-difference time domain (FDTD) method"
Wojciech Gwarek, Prof. D.Sc.,

Award of the Minister of Science and Higher Education: Top 500 Innovators - Science - Management-Commercialization Programme
Marek Bury, Ph.D.

Team Award of the Minister of Health

Tymon Rubel, Ph.D.,

Scientific Award in Technical Sciences of the Polityka magazine

Piotr Bilski, Ph.D.

Award of the TV-SAT Magazine

„Patent Satelitarny" (Satellite Patent).
Józef Modelski, Prof. D.Sc.

Awards of the Rector

Sebastian Kozłowski, Ph.D.,
Individual II^{o} award for the Ph.D. thesis titled: *"Analysis and investigation of MIMO systems utilizing adaptive array antennas."*

Jan Żera, D.Sc.,
Individual II^{o} award for the elaboration of laboratory titled: *"Basics of hearing and sound perception."*

Józef Modelski, Prof. D.Sc.,
Individual II^{o} award for the organizational achievements in academic year 2010/2011

Roman Z. Morawski, Prof. D.Sc.
Individual III^{o} award for the organizational achievements in academic year 2010/2011

Jacek Wojciechowski, Prof. D.Sc.
Kajetana M. Snopek, Ph.D.,
Team I^{o} award for the textbook *"Signals and Systems"*.

Henryk Chaciński, M.Sc.
Wojciech Kazubski, Ph.D.
Tomasz Kosiło, Ph.D.,
Juliusz Modzelewski, Ph.D.
Karol Radecki, Ph.D.
Team I^{o} award for the textbook *"Radiocommunication systems. Gathering of exercises"*.

Award of the students of the Faculty

Golden Chalk" Award.
Jacek Cichocki, Ph.D.,

Award of *the Foundation for the Development of Radiocommunications and Multimedia Technologies* **in the Ph.D. competition**
Sebastian Kozłowski, Ph.D.

Special Award of *the Special Forum & Exhibition on "Best of East – for Eastern Partnership*
Krzysztof Zaremba, D.Sc.,

Awards granted for the conference papers and posters

Dariusz Radomski, Ph.D.
The distinction for the presentation of paper at *7th International Conference on Computer Recognition Systems: CORES 2011* (Wrocław, Poland, May 23-25, 2011).

Tymon Rubel, Ph.D.,
The first place for the best poster competition at *Autumn Scientific Workshops* organized by *Center for Advanced Studies Warsaw University of Technology* (Mądralin, Poland, Oct. 14-16, 2011).

Award of *the Foundation for the Development of Radiocommunications and Multimedia Technologies* **in the Young Authors' competition**

Marta Kalbarczyk
The outstanding paper presented in the Young Authors' Competition, granted by Foundation for the Development of Radiocommunication and Multimedia Technologies at *National Conference on Radiocommunications and Broadcasting*, (Poznań, Poland, Jun. 8-10, 2011).

Scholarships of *the Foundation for the Development of Radiocommunications and Multimedia Technologies*

For preparing Ph.D. Thesis
Marcin Jędryka
Mariusz Lewandowski
Paweł Ziętek

For preparing M.Sc. Thesis
Marcin Darmetko
Piotr Marszał
Krzysztof Ostrowski
Maciej Trochimiuk
Paweł Wasiluk
Paweł Wąsowski
Jakub Wiszowaty
Michał Zyskowski

For preparing B.Sc. Thesis
Marcin Iwanow
Artur Jóźwikowski
Agnieszka Naplocha
Przemysław Piasecki
Jakub Żurkowski

10. STATISTICAL DATA (for Dec. 31st of each year)

SPECIFICATION	2007	2008	2009	2010	2011
academic staff [posts] total	60,5	64,5	63,25	62,08	65,5
tenured professors	4	4	5	4,5	4,5
professors	7	7	8	8	9
associate professors	2,5	1,5	0,5	0,5	0
assistant professors	39,5	40,75	39	38,75	41,6
readers	2	4	4	4,33	4,25
senior lecturers	4,5	4,5	4,5	4	4
assistants	1	1,75	2,25	2	2,15
Ph.D. students [persons] total	34	43	36	39	37
regular, the third level studies	13	23	23	23	23
without scholarship	21	20	13	16	14
technical and administrative staff [posts] total	18,1	18,25	18,9	18,4	19,2
senior R&D associates			2,4	2,9	2,5
R&D associates	8,6	8,25	4,75	4,75	4,35
administrative associates	6,5	7	9	9	10,35
service workers	2	2	2	2	2
temporary staff (Proteus project + ENIAC)			4,8	12,5	7,7+0,4
library resources books (volumes)	15530	15785	15924	16055	10993
books (titles)	8488	8662	8774	8888	7204
journals (subscribtions)	126	126	126	83	83
teaching activities basic courses	62	61	63	67	67
advanced courses	22	25	25	27	23
other courses	60	57	58	73	47
international course projects	4	1	2	2	2
research projects total	55	48	48	47	40
international	8	9	9	4	4
granted by Ministry	15	16	15	19	17
granted by the University	17	18	18	20	17
other	12	5	9	4	2
research projects budget **PLN:**	4 833 000	5 712 877	6 853232	6 555168	4 987642
Euro:	495 000	211 000			+ 1 500000 *
titles and degrees awarded Prof. titles	-	-	-	-	1
D.Sc.. degrees	-	-	-	-	-
Ph.D. degrees	5	4	6	6	4
M.Sc. degree (regular studies + evening studies)	63+3	75+2	67+8	57+10	62+3
M.Sc. degree (studies in English)	1	-	-	2	-
B.Sc. degrees (regular studies + evening studies)	55+16	47+10	65+7	77+11	84+11
B.Sc. degrees (studies in English)	4	5	5	3	7
B.Sc. degrees (distant learning)	1	1	2	-	2
publications total	229	194	197	206	165
sci.-tech. books and chapters in books	1	12	12	9	6
sci.-tech. papers in journals - total	82	92	100	94	76
JCR-ICI list (IF>0)	32	39	21	20	20
MSHE list	32	49	72	67	55
in other journals	18	4	7	7	1
sci.-tech. papers in conference proceedings	131	69	58	74	74
other publications	15	21	27	29	9
research reports	38	27	26	22	24
conferences attended by the staff	56	52	60	40	41

* investement from the Polish Science and Technology Fund into instrumentation - *Laboratory of Hyperpolarized Contrast for MRI*

EXPLANATORY NOTE ON POLISH ACADEMIC AND PROFESIONAL TITLES, DEGREES AND POSTS

According to Polish law, the following terms are used for academic and professional titles, degrees and posts held by staff members at the Institute of Radioelectronics.

The academic title of ***profesor (prof.)***, is conferred by the president of the Republic of Poland upon a motion of the Central Commission for Academic Degrees and Title.
This title may be awarded to a person who:

- has obtained a degree of *doktor habilitowany*;
- has scientific achievements, which fall far beyond the requirements for the candidates applying for the degree of doktor habilitowany;
- has remarkable didactic achievements, among other things, within the scope of training of academic staff.

Academic degrees awarded by the organizational unit entitled to confer such degrees, it means the respective Faculty Council or another organizational unit of a higher education institution or another scientific institution.

- ***doktor (dr)***, translated here as **Ph.D.**, is conferred to a person who:
  - holds the professional title of *magister* or *magister inżynier*;
  - has successfully passed doctorate examinations covering the scope defined by faculty board; and
  - has submitted and successfully defended a doctoral thesis assessed favorably by two reviewers.

The doctoral dissertation, prepared under the supervision of a tutor, should provide an original solution of a scientific problem and present general theoretical knowledge of the candidate in a given discipline of science, as well as should confirm the candidate's skill to conduct scientific work independently

- ***doktor habilitowany (dr hab.)***, translated here as **D.Sc.**, is conferred to a person who:
  - holds the academic degree of *doktor*;
  - has remarkable scientific achievements;
  - has submitted a habilitation dissertation which contributes significantly to the development of a given scientific discipline;
  - has received favorable assessment of his/her dissertation from four reviewers;
  - has passed a habilitation examination; and
  - has delivered a favorably assessed habilitation lecture.

The dissertation may constitute a work completed by candidate after he/she was awarded the degree of *doktor*. This work should be also published as a whole or in its fundamental part. The *doktor habilitowany* degree authorize the holder to promote doctoral theses.

- ***profesor doktor habilitowany (prof. dr hab.)***, translated here as **Prof. D.Sc.**, is conferred to a person who holds the academic degree of *doctor habilitowany* and the academic title of *professor*.

Research and teaching posts:

- ***asystent*** – *magister* professional title is required;
- ***adiunkt*** – *doktor* degree is required;
- ***profesor nadzwyczajny*** – *doktor habilitowany* degree is required;
- ***profesor zwyczajny*** – *profesor* title is required.

Teaching posts:

- ***wykładowca***, translated here as **Lecturer**;
- ***starszy wykładowca***, translated here as **Senior Lecturer**,
- ***docent***, translated here as **Reader** – doktor degree is required;

Professional titles:

- ***inżynier (inż.)***, translated here as **B.Sc.**, are awarded to the graduates of higher vocational studies in the technical fields of study when the technical subjects constitute not less than 50% of the total of didactic activities included in the timetable for this fields of study;
- ***magister (mgr)***, translated here as **M.Sc.**, are awarded to the graduates of master-level courses in such fields of studies as: natural sciences, mathematics etc.;
- ***magister (mgr)***, translated here as **M.A.**, are awarded to the graduates of master-level courses in the arts and humanities fields of studies.
- ***magister inżynier (mgr inż.)***, translated here as **M.Sc.**, are awarded to the graduates of master-level courses in the technical fields of studies.

The following English titles have been adopted here for Polish academic posts:

- **Assistant –** the holder of the *magister inżynier* professional title in the post of *asystent*;
- **Assistant Professor** – the holder of *doktor* degree in the post of *adiunkt*;
- **Reader** – the holder of *doktor* degree in the post of *docent*;
- **Associate Professor** – the holder of *doktor habilitowany* degree in the post of *adiunkt*;
- **Professor** – the holder of *doktor habilitowany* degree in the post of *profesor nadzwyczajny*;
- **Tenured Professor** – the holder of a *profesor* academic title in the post of *profesor zwyczajny*.