Your research gate to Horizon 2020

Find the best partner for your project

Your project partners from the Region of Western Pomerania
POLAND

Table of Contents

Food & Biotechnology .....4 - 23

Nanotechnology, Materials & New Production Technologies .....24 - 49

Health .....50 - 67

Information & Communication Technologies .....68 - 91

Environment .....92 - 111

Energy .....112 - 121

Transport .....122 - 137

Socio-economic Sciences .....138 - 151

Architecture .....152 - 159

Name Index .....160 - 163

Dear Readers,

To achieve success in science today it is not enough to confine yourself to your laboratory and work hard. On the contrary, it is necessary to open up your laboratory and invite other people to participate in and contribute to the work. In other words, it is necessary to get in touch, or to form networks with similarly minded people who share – or complement – our interests, potential, and resources. This publication is intended to facilitate such networking. You will find information on research pursued by leading research centres of Western Pomerania, a region in the north-western part of Poland. You will also find information on expertise offered and co-operations sought by research groups which have opened up their laboratories to you. This is particularly important in the advent of Horizon 2020. The research groups described in this publication welcome opportunities of joint application for research projects that Horizon 2020 will entail. An opportunity to combine efforts and jointly use state-of-the-art laboratories and knowledge base available in Europe, including the laboratories highlighted in this publication, cannot be overestimated – and should not be missed! Undertaking joint efforts in overcoming barriers for innovation and in advancing the frontiers of science and technology for the benefit of the society in Europe 2020 is, in our opinion, an appropriate motivation for collaboration and for taking advantage of cooperation opportunities, including those presented in this publication.

We do hope that this publication will help you in locating and finding a partner or partners for your new research initiative. Please feel free to contact us or get directly in touch with scientists from among those listed in this publication who are relevant to your research needs and with whom you will establish a fruitful research cooperation.

We invite you to read. We invite you to network!
Your Team of the Regional Contact Point for EU Framework Programmes in RCIiTT, ZUT.

The Regional Centre for Innovation and Technology Transfer (RCIiTT) was founded in 1999, in response to the need for international co-ordination of research programmes carried out at the University of Technology in Szczecin. Currently, RCIiTT provides advice and training for researchers, graduates and companies in research funding, partner search, and commercialization of knowledge. The RCIiTT mission is to create a culture of innovation and entrepreneurship, to initiate and support co-operation between businesses and academic environments. In addition, RCIiTT fosters networking between academia and interested businesses and animates development of industrial clusters to generate and increase opportunities for translating scientific achievements into commercial practice, which involves initiating and rationalizing technology transfer from the Research & Development sector to the economy. Every year, RCIiTT provides more than 600 consultations and organizes more than 60 training courses. The Centre is a member of the Enterprise Europe Network, the world's biggest network supporting small-medium enterprises (SMEs).

RCIiTT offers:

- expert advice regarding national and international technology transfer;
- assistance in commercialisation of research results;
- promotion of innovation;
- support for and organisation of foreign trade missions;
- advice in preparation of international trade agreements;
- assistance in cluster initiatives.

Contact to RCIiTT:
Tel.: +48 91 449 43 54
e-mail: innowacje@zut.edu.pl
www.innowacje.zut.edu.pl

The Regional Contact Point (RCP) for UE Framework Programmes operates as a part of the Regional Centre of Innovation and Technology Transfer (RCIiTT) and is a link in a network of Western Pomeranian Contact Points at the top five universities in the region. In addition to promoting research teams, RCP provides a variety of customer support programmes, including consultations, training sessions and workshops concerning EU funds for research & development, new technologies, innovative implementations in industrial sectors and transnational research fellowships. RCP primarily aims at increasing scientists' awareness of the range of research opportunities offered by the European framework programmes and thereby encourages participation in those programmes. As a regional public body operating in the international context, RCP has both the knowledge of the Region's research and economic potential and experience in international cooperation. Owing to long practice in the framework programmes and other R&D international initiatives, RCP assists its customers (researchers, entrepreneurs) in preparation and submission of proposals and in actual conducting the projects. The RCP efforts bring fruit in successful projects and in co-operative endeavours which results in numerous internationally funded projects. RCP assists the Region's successful scientists in their negotiations with the European Commission, in preparing the consortium agreement, and in project management. RCP's work contributes to the effective and efficient running of international cooperation and scientific research.

RCP offers:

- individual meetings with potential beneficiaries of European funds;
- supporting potential beneficiaries by organising information and awareness campaigns, training courses, information days and workshops;
- preparation of technical guides to assists researchers and entrepreneurs in efficient applying for funding and in implementing their innovative ideas;
- maintaining a regional database of scientists, organisations and enterprises interested in taking innovative research actions;
- providing consultations, seminars and mailing services aimed at supplying its addressees with the most current and relevant information concerning RTD.

Tel.: +48 91 449 47 23
e-mail: rtd@zut.edu.pl
www.rpk.szczecin.pl

1

Food & Biotechnology

West Pomeranian University of Technology, Szczecin
ul. Janickiego 35
71-270 Szczecin
Poland
www.cbimo.zut.edu.pl

Professor Artur Bartkowiak, Ph.D., D.Sc., Eng.

The Centre of Bioimmobilization and Innovative Packaging Materials
e-mail: cbimo@zut.edu.pl
phone: +48 91 449 65 94

The Centre of Bioimmobilization and Innovative Packaging Materials (CBIMO) is an interdisciplinary group of specialists working on:

- innovative packaging materials (bioplastics, modified polymer films/foils, improvement of barrier properties);
- modification of cellulose materials (innovative formulations for coating applications);
- active and intelligent packaging systems (active substances and antimicrobial properties, nanomaterials and nanotechnologies in paper industry applications);
- bioimmobilization of substances for different applications (food additives, paper industry additives, biotechnology, microbiology);
- formation and characterization of biodegradable materials and microencapsulation of bioactive substances for different industrial applications.

CBIMO is involved in many international and national projects, contributing its experience in the development of innovative, environmentally friendly solutions with a potential for industrial applications. CBIMO cooperates with businesses from different sectors – including biotechnology, packaging (paper and cardboard, bioplastics, and plastics), food additives, active substances, etc.
The CBIMO research infrastructure includes well-outfitted laboratories with SEM, microscopy (stereoscopic, fluoroscent), and facilities for OTR and WVTR determination, contact angle, ultrasonic homogenization, DMTA, climatic chambers, bio-reactors, FTIR, particle size distribution, rheology, spray-drying, antimicrobial properties determination, micro and nano-encapsulation, simulation of biodegradation.

The expertise offered includes:

- morphological, mechanical, antimicrobial and barrier characterization of cellulose and bioplastics packaging materials;
- application of bioimmobilization for various technological and industrial processes;
- "packaging" of active substances at micro and nanoscale, design of active materials, and biotechnological processes;
- knowledge base in biopolymers (characterization, properties, modification); bioplastics (PLA, PHAs, treatment and processing); packaging materials (cellulose materials such as paper, paperboard, biocomposites, films, foils, plastics: characterization of properties, modification/improvement of barrier properties, design of active packaging systems, functionalization such as: antimicrobial properties), bioactive substances (antioxidants, antimicrobials, natural preservatives), bioimmobilization (active substances, living cells, bacteria), bio-reactions (bacteria, continuous production), nanocarriers and nanomaterials.

We have experience in Framework Programmes as a coordinator and a partner.

Keywords describing the expertise offered:
bioimmobilization, nanomaterials, active packaging materials, bioplastics, biopolymers, films, foils, paper, paperboard

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology, Szczecin
ul. Papieża Pawła VI 3
71-459 Szczecin
Poland
www.wnozir.zut.edu.pl

Professor Waldemar Dąbrowski, Ph.D., D.Sc.

Faculty of Food Sciences and Fisheries
Department of Applied Microbiology and Biotechnology
e-mail: waldemar.dabrowski@zut.edu.pl
phone: +48 91 449 65 40

The group works primarily on various aspects of:

- food safety and quality control, including new emerging pathogens, toxigenic potential of pathogenic bacteria under diverse/atypical conditions encountered in food and food processing environment; survival and adaptative abilities of pathogenic bacteria to hostile environments; preventive measures to be undertaken to eliminate and/or stop the activity of harmful/spoilage/spore-forming bacteria, including new technologies (e.g. cold plasma);
- enzymatic activity of selected microorganisms of marine/freshwater and soil origin, mostly bacteria, particularly Actinomycetes, isolated worldwide, and their potential application in fish culture, horticulture, etc.;
- potential use of selected lactic acid bacteria strains as pro-/prebiotics;
- bacteria as wholesome food/feed additives;
- fast and reliable molecular techniques in identification as well as inter- and intra-species differentiation of pathogenic bacteria from diverse environments - food and water, in particular; and in tracing the source of contamination with pathogens;
- PCR techniques in detecting food adulteration;
- microorganisms and their role in water microcosms, including: structural and functional diversity of microbes in water environments; tracing the source of water contamination with pathogenic bacteria; microbial communities as the trophic web base; microorganisms as immunity stimulators for aquatic biota; molecular ecology.

The research infrastructure used includes Vitek Systems ATP Expressions, equipment for PCR and real-time PCR, Gel Doc System, chambers with laminar air flow, INFORS AGCH bioreactor, fluorescent microscopy.

The expertise offered includes primarily:

- assessment of food quality and safety based on fast methods of microbiological hazard identification, including toxigenic potential of strains and new pathogens and detecting food adulteration;
- selection of microbes with a potential to be used as pro-/prebiotics or source of desired enzymes, etc.;
- identification of specificity and role of individual microbes in diverse ecosystems.

Keywords describing the expertise offered:

new pathogens, strains toxigenicity, detecting food adulteration, pro-/prebiotic bacteria

Food & Biotechnology

University of Szczecin
ul. Wąska 13
71-415 Szczecin
Poland
www.kbr.wb.univ.szczecin.pl

Professor Ewa Kępczyńska, Ph.D., D.Sc.

Department of Plant Biotechnology
e-mail: ekepcz@wp.pl
phone: +48 91 444 16 93

The Department of Plant Biotechnology (DPB) conducts comprehensive research on green biotechnology with a special emphasis on:

- somatic embryogenesis (SE), including:
  - the role of gibberelins and abscisic acid in Medicago spp. SE;
  - regulation of gene expression during SE by the hormones mentioned;
- role of jasmonates, salicylates and β-aminobutyric acid in fungal pathogen development;
- induction of systemic resistance (ISR) against phytopathogens – physiological, biochemical and molecular basis;
- plant growth promotion by rhizobacteria (PGPR) – physiological, biochemical and molecular basis.

DPB is involved in national research projects and aims at developing innovative, environmentally friendly biofertilizers, biostimulants, bioprotectants and natural elicitors of induced systemic resistance.

The infrastructure used includes laboratories equipped in climatic chambers with LED illumination, class I and II laminar flow hoods, incubated orbital shakers, lean benches, freezers and ultra-deep freezers, UV-VIS double-beam spectrophotometer, plate reader, HPLC chromatograph, thermocyclers (standard, gradient and real-time), and Advanced Gel Documentation System.

The expertise offered includes:

- assessing growth of bacteria, fungi and plants under in vivo and in vitro conditions;
- determining antimicrobial properties;
- microscopic analysis of plant material (including that affected by microbial pathogenesis);
- spectrophotometric assays of enzymatic activities, including stress markers (catalase, peroxidase, phenylalanine ammonia lyase);
- chromatographic quantification of carbohydrates and phenolic compounds;
- application of molecular techniques, including gene expression analysis.

Keywords describing the expertise offered:

somatic embryogenesis, micropropagation, hormonal regulation of somatic embryogenesis and plant defence, induced systemic resistance (ISR), plant growth promoting microorganisms (PGPM), stress markers, high pressure liquid chromatography (HPLC), gene expression

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology, Szczecin
ul. Kazimierza Królewicza 3
71-550 Szczecin
Poland
www.wnozir.zut.edu.pl

Professor Kazimierz Lachowicz, Ph.D., D.Sc., Eng.

Faculty of Food Sciences and Fisheries
Meat Science Department
e-mail: kazimierz.lachowicz@zut.edu.pl
phone: +48 91 449 65 80

The Meat Science Department is an interdisciplinary group of specialists working primarily on:

- effects of biological (including nutrition) and genetic factors on structural and mechanical properties of meat;
- suitability of game and exotic animals meat as well as game birds and ostriches for culinary and meat products;
- production of healthy dry-cured and cooked foods;
- modification of meat ripening process via chemical, physical and enzymatic treatment;
- utility and susceptibility of meat to massaging with traditional and innovative methods of tenderising;
- utility of local raw material resources for production of food with improved health-benefits as a developmental chances for the Province of Western Pomerania.

The research infrastructure used includes light microscopes (with computer image analysis systems), cryostats (including cryogenic LN2 containers), Instron for texture and rheology analyses; miniaturised production lines for fermented, dry-cured and heat treated sausages/hams: climatic chambers, tumblers, cutters, stuffers, smoking boxes etc.

The expertise offered includes:

- histochemical characterization of muscle fibres type and muscle structure;
- assessing meat texture properties;
- determining raw materials and final meat products rheology;
- modifying/improving texture and sensory properties of meat products with mechanical, chemical and enzymatic treatments;
- design and manufacture of products with improved health-enhancing qualitieis;
- assessing meat product quality and safety.

Keywords describing the expertise offered:

microscopy (histochemistry), rheology, texture, meat properties, meat technology

Food & Biotechnology

Koszalin University of Technology
ul. Racławicka 15-17
75-620 Koszalin
Poland
www.tu.koszalin.pl/eng

Dr Tomasz Piskier, D.Sc., Eng.

Department of Mechanical Engineering
Division of Biological Agriculture Foundations
e-mail: piskier@poczta.onet.pl
phone: +48 94 347 82 97
mobile: +48 606 430 320

The Division of Biological Agriculture Foundations, in cooperation with sibling units (the Division of Food Industry Processes and Devices; the Division of Biochemistry and Biotechnology; the Unit of Automatics) is an interdisciplinary group of specialists in food technology and human nutrition as well as in agricultural and forest technologies.

The main research interests of the group concern:

- modern no-tillage systems; developing innovative technologies for raw materials cultivation;
- processing using traditional knowledge to create food products with health-enhancing properties;
- increasing the variety of products based on traditional knowledge via developing innovative processing technologies and techniques;
- developing systems of intelligent plant-human communication;
- biomass production and conversion for energy;
- production of second-generation fluids; enzymatic cellulose hydrolysis.

Individual research units collaborating as the "Biocentrum" have a join capacity to monitor all the operations involved in cultivation, harvesting, storage and processing up to delivery of a product to the food market. The "Biocentrum" is also involved in sensory testing of raw materials, half-products and final products. The key area of interest is the analysis of ingredients of raw materials and resultant products.

The expertise offered includes:

- determining effects of no-tillage systems on changes in soil environment and plant yield;
- testing plant responses to stress-causing factors;
- determining sensory qualities of niche agricultural raw materials and products;
- developing technologies of health-enhancing product manufacture with the use of traditional methods to create innovative foods;
- conducting studies on identification of conditions optimal for raw materials storage and on selecting packaging appropriate for finished products and for extending their shelf life;

The group is interested in cooperating in:

- creation of product image and development of promotion systems for individual health-enhancing products;
- testing the utility of biomass manufacture of second-generation bio-ethanol.

Keywords describing the expertise offered:

no-tillage system, soil and crops assessment, innovative technologies, new product development, food quality analysis and assessment, biomass, bio-ethanol, enzymatic hydrolysis

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology, Szczecin
ul. Papieża Pawła VI 3
71-459 Szczecin
Poland
www.wnozir.zut.edu.pl

Professor Mikołaj Protasowicki, Ph.D., D.Sc., Eng.

Department of Toxicology
e-mail: mikolaj.protasowicki@zut.edu.pl
phone: +48 91 449 65 50

Department of Toxicology groups scientists solving problems associated with food toxicology and hygiene as well as ecotoxicology, with a particular reference to aquatic ecosystems.

The research pursued is primarily focused on:

- the occurrence of chemical contaminants (metals, organochlorine pesticides, PCBs, PAHs, and other) in food, drinks and drinking water, in relation to contaminant origin (environment, processing, packaging, transportation, storage);
- a potential of technological processing and culinary treatments to reduce chemical contamination in final food products;
- cycling of xenobiotics in aquatic and terrestrial ecosystems (soil–plant–animal and water–sediments–organisms systems), including monitoring of hydrobiota and abiotic compartments of aquatic ecosystems for pollution with metals, pesticides, PCBs, PAHs, etc.;
- dynamics of bioaccumulation, elimination and detoxication of xenobiotics in aquatic organisms, and effects of fish intoxication with metals, PCBs, and other toxic or dangerous substances;
- prediction of changes in pollution levels in hydrobiota, based on analysis of long data series.

The group has been involved in national and international research projects, including the Programme for the Odra River 2006, the International Odra Project, and the Baltic Monitoring Programme.

The research infrastructure consists of well equipped laboratories making it possible to carry out analyses of a wide range of chemicals, including toxic metals (e.g., Pb, Cd, Hg, As), micro and macroelements (e.g., Zn, Cu, Na, K, Cr, Fe, Mn, Ni, V), and residues of organochlorine pesticides (OCPs), polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), etc. in various complex matrices such as food, plant and animal tissues, soil, sediments, water. Speciation of metals in sediments and soils is examined as well. Advanced analytical techniques are used for accurate detection and precise quantification of elements and compounds. The laboratory equipment includes chromatographs (GC/MS and HPLC), atomic absorption spectrometers (GF-AAS and CV-AAS), atomic emission spectrometer (ICP-AES), microwave digestion system, lyophilizer, incubators, homogenizers, centrifuges, vacuum rotary evaporators, etc.

The expertise offered includes:

- conducting assays and analyses of a wide range of chemicals, including toxic metals (e.g., Pb, Cd, Hg, As), micro and macroelements (e.g., Zn, Cu, Na, K, Cr, Fe, Mn, Ni, V), and residues of organochlorine pesticides (OCPs), polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), etc. in various complex matrices such as food, plant and animal tissues, soil, sediments, water;
- examining speciation of metals in sediments and soils.

Keywords describing the expertise offered:
ecotoxicology, food toxicology and hygiene, separation science, liquid chromatography, gas chromatography, atomic absorption spectrometry, atomic emission spectrometry, quantitative analysis, chemical speciation, trace elements, heavy metals, organochlorine pesticides, PCBs, polycyclic aromatic hydrocarbons, persistent organic pollutants

West Pomeranian University of Technology, Szczecin
ul. Papieża Pawła VI 3
71-459 Szczecin
Poland
www.wnozir.zut.edu.pl/EN/jednostki/katedra-technologii-zywnosci.html

Mariusz Szymczak, Ph.D., Assistant Professor
Grzegorz Tokarczyk, Ph.D.

Faculty of Food Science and Fisheries, Fish Technology Group
Department of Food Science and Technology
e-mail: mszymczak@zut.edu.pl; gtokarczyk@zut.edu.pl
phone: +48 91 449 65 22

The Fish Technology Group (FTG) consists of interdisciplinary specialists whose work is primarily focused on:

- fish and seafood processing technologies, especially marinating, salting, canning and surimi;
- properties, purification and application of selected proteolytic enzymes and transglutaminase;
- by-products and waste recovery in fish industry;
- analysis of lipids, phospholipids and fatty acids;
- analysis of fish lipid quality (lipid oxidation);
- analysis of proteins and products of their hydrolysis;
- changes in fish during cold storage and freezing;
- low-value fish, fish fragments and filleting remains as materials for extruded food;
- detection of fish product falsification;
- food-related legal regulations.

In addition, FTG pursues research on modern and green technologies in fish processing and the use of by-products in manufacturing innovative food products. We have been involved in numerous research projects, including development of innovative, environmentally friendly solutions with a potential for industrial applications. FTG cooperates with industrial partners from different sectors, including biotechnology, packaging, food additives, active substances, etc.

The FTG research infrastructure includes FPLC, GC+MS, CE+LIF, HPLC, an ultrasonic homogenizer, a texture analyzer, an ultra-centrifuge, and 2D SDS-PAGE equipment, a fluorimeter, a Hunter Lab, an ultra-freezer, a lyophiliser, and an extruder. The research facilities include also specialised production lines for fish smoking, canning (closing and sterilization), fish burgers and fish flesh deboning.

The expertise offered includes:

- analysis of composition (protein, fat, water, etc.) and properties (texture, colour, sensory assessment) of foods;
- characterisation of protein hydrolysis products (poly- and oligo-peptides, amino acids) and essential fatty acids;
- research on proteolytic enzymes and application of transglutaminase;
- assaying total volatile nitrogen bases and biogenic amines;
- determination of bioactive peptide properties.

Keywords specifying the offered expertise (50-200 characters including spaces)
innovative fish technology, seafood, by-products, enzymes, protein, bio-peptides, lipids

Koszalin University of Technology
ul. Racławicka 15
75-640 Koszalin
Poland
www.wm.politechnika.koszalin.pl/kss/

Dr Dariusz Tomkiewicz, Eng.

Department of Mechanical Engineering
Control Engineering Group
e-mail: dariusz.tomkiewicz@tu.koszalin.pl
phone: +48 94 347 82 72
mobile: +48 502 738 034

The Control Engineering Group (CEG), a part of the Department of Mechanical Engineering, conducts research on:

- novel techniques and methods in monitoring and control of processes in the food and chemical industries and in precision farming;
- novel measurement techniques, mathematical modelling;
- model identification;
- dynamic optimisation;
- simulation, signal and image processing.

CEG has worked with:

- embedded systems;
- wireless autonomous sensor;
- algorithms for soft sensors to monitor environmental conditions, food quality and plant stress factors;
- application of artificial intelligence algorithms (fuzzy sets, neural networks) to control, monitor and fuse data;
- application of image processing techniques for food quality assessment.

The CEG research infrastructure includes a climatic chamber for research on food storage processes; a chamber for research on monitoring plant grow stress factors; sensors for monitoring environmental conditions; devices for the design and programming embedded systems; devices for measurement and analysis of electrical properties of food materials.

CEG offers expertise and seeks cooperation on:

- application of control algorithms in food processing, precision farming and chemical industry;
- real time sensing methods in precision farming;
- optimal (energy efficient) control strategies;
- methods of active ventilation and microclimate control;
- methods of microclimate control in storage chambers;
- methods of material quality monitoring based on digital image processing (computer visualisation);
- methods of water content and water activity measurement during material drying or storage.

Keywords describing the expertise offered:

wireless sensor, microclimate control, storage, biochemical processes modelling, model identification, water activity measurement, image processing, sensor and data fusion, signal processing

Food & Biotechnology

West Pomeranian University of Technology, Szczecin
ul. Doktora Judyma 6
71-466 Szczecin
Poland
www.zut.edu.pl

Dr Agnieszka Herosimczyk

Faculty of Environmental Management and Agriculture
Department of Physiology, Cytobiology and Proteomics
e-mail: agnieszka.herosimczyk@zut.edu.pl
phone: +48 91 449 67 76
mobile: +48 507 532 030

The Department of Physiology, Cytobiology and Proteomics (DPCP) consists of a group of scientists with extensive experience in research on comparative proteomics utilising two-dimensional electrophoresis (2-DE) and MALDI-TOF mass spectrometry. DCPC conducts research on:

- effects of pharmaceuticals (e.g. immunosuppressive drugs) on proteomic changes in selected tissues;
- effects of physiological factors (i.a. pregnancy) on proteome changes in biological fluids and in immunocompetent cells;
- effects of dietary changes (including functional foods) on proteome changes in biological fluids and tissues;
- analysis of renal function in physiological aspects of neonatal period (including changes in water channel expression).

The DPCP research infrastructure consists of laboratories featuring equipment for analysing protein changes in complex biological systems (such as tissues) and physiological fluids (such as urine, plasma/serum and saliva). Bioinformatic analysis of protein profiles along with protein identification is carried out as well. DPCP has also a laboratory dedicated to Western blot analysis. The laboratory equipment includes a MALDI-TOF mass spectrometer, an apparatus for isoelectrofocusing (separation of proteins in the first dimension), an electrophoretic chamber for SDS-PAGE (separation of proteins in the second dimension), an electroblotter, bioinformatic tools for the assessment of protein expression changes on 1-D and 2-D gels and membranes, a microplate spectrophotometer, and an osmometer.

The expertise offered includes:

- analysing protein changes in complex biological systems and physiological fluids;
- bioinformatic analysis of protein profiles along with protein identification;
- Western-blot analysis;
- analysing proteome changes induced by physiological or pathological factors;
- assessing effects of dietary manipulations (e.g. addition of pre- or probiotics) or pharmaceutics on proteome changes in tissues or body fluids;
- organizing and conducting proteomics training and workshops.

Keywords describing the expertise offered:
physiology, proteomics, two-dimensional electrophoresis, MALDI-TOF MS, Western-blot

ASPROD Sp. z o.o.
ul. Piastowska 46
Kliniska Wielkie
72-123 Kliniska Wielkie
Poland
www.asprod.com.pl

Artur Kozak
Sales Department
e-mail: a.kozak@asprod.com.pl
phone: +48 91 460 24 00
mobile: +48 519 315 612

Asprod is a craft factory, bakery and patisserie. Founded in 1991 as a bakery, Asprod pursued the objective of manufacturing not only tasty, but wholesome products prepared from traditional recipes. Today we have more than 50 retail outlets in western Poland. Our pastries are also available in many good grocery stores. We specialize in producing top-quality breads and pastries which often win industry competitions. Our products have been awarded the PDŻ (Meet the good food) certificate granted by the Minister of Agriculture.

Asprod specialties include:
- bread wheat, rye, spelled, grainy (also frozen);
- rolls, croissants, baguettes;
- bread baked from dough at the point of sale (LAF technology);
- cakes (also frozen).

Our main strengths include a solid and stable position at the local market, a high production capacity and a constant supply of high quality products appreciated by customers.

Offered expertise:
We offer our customers the highest quality breads and pastries, fresh and frozen.

We are able to fill special orders, e.g. customizing the products and using customers' recipes.

Keywords specifying the offered expertise:
Asprod bakery, bread, cakes, frozen bread, LAF technology, confectionery

Pomeranian Medical University, Szczecin
ul. Broniewskiego 24
71-460 Szczecin
Poland
www.pum.edu.pl/wydzialy/wydzial-nauk-o-zdrowiu/zaklad-biochemii-i-zywienia-czlowieka-katedry-biochemii-i-chemii-medycznej

Professor Ewa Stachowska, M.D., Ph.D., D.Sc.

Department of Biochemistry and Human Nutrition
e-mail: ewa.stachowska@pum.edu.pl
phone: +48 91 441 48 06

Department Biochemistry and Human Nutrition (DBHN) is an interdisciplinary group of specialists working within the Faculty of Biochemistry and Nutrition. DBHN's research activities are mainly focused on the following topics:

- dietetics (human nutrition in the wide plains);
- food technology;
- lipid metabolism (fatty acids; fatty acid derivatives – HETE, HODE, fatty acid enzyme activity).

DBHN has expertise in:

- between-cohort diet analysis (healthy and unhealthy individuals);
- lipid metabolism from the standpoint of human and animal physiology and pathology;
- food technology.

DBHN has well equipped modern labs equipped for analyses of fatty acid profile and lipid derivatives by gas chromatography, HPLC and ELISA. We also have a cell culture laboratory (where we work mainly with hepatocytes (Hep 2G) and monocytes (THP-1).
The DBHN infrastructure allows to perform human cohort research (a complete set of equipment for blood drawing, consulting rooms); completely furnished kitchen and a food technology laboratory.
DBHN is involved in national projects; has expertise and is experienced in developing innovative solutions with a high implementation potential.

Offered expertise:

Cohort prospective study (in the field of human nutrition and food analysis); lipid analysis (fatty acid profile, derivatives); active substances in food (antioxidants).
We offer / We have:

- modern infrastructure: laboratories, equipment: gas chromatography, HPLC, cell culture labs with complete equipment, ELISA detection;
- consulting-rooms equipped in anthropometric analysers, wearable metabolic system, weighing scales;
- kitchen and food technology laboratory equipped in lyophilyser, homogenisers, fibre analyser, Soxhlet extractor, Kjeldahl distillation system.

Keywords specifying the offered expertise:
human nutrition, cohort study, lipids, fatty acids

University of Szczecin
ul. Wąska 13
71-415 Szczecin
Poland
www.wb.usz.edu.pl

dr Jakub Skorupski, D.Sc., Eng.

Institute for Research on Biodiversity
e-mail: jakub.skorupski@usz.edu.pl
phone: +48 91 444 16 85
mobile: +48 512 014 658

Institute for Research on Biodiversity consists of 4 departments: Department of Invertebrate Zoology and Limnology, Department of Cell Biology, Department of Ecology and Environmental Protection, Department of Plant Taxonomy and Phytogeography and Department of Vertebrate Zoology and Anthropology.

The research equipment and infrastructure includes a boat with GPS, lake sediment samplers, Van Veen samplers, a car adapted to boat transport, the fully equipped Centre for Molecular Biology and Biotechnology, a scanning electron microscope, fluorescent & stereoscopic microscopes, UV-Vis spectrophotometer, HPLC liquid chromatograph, an automatic system for confocal and epifluorescence live cell imaging in real time with an integral image analysis software, an optical microscopic kit for fungal research, a probe with sensors for measuring and recording water physico-chemical parameters, a colorimeter for analysis of physico-chemical parameters of water with a reactor for water sample mineralization, a system for documenting fluorescently and chemiluminescently labelled gels, a high speed refrigerated centrifuge, an incubation set equipped with a shaker & cooler, an ELISA kit, an inverted microscope, an ultrasonic homogenizer, a mobile laboratory with equipment for field analyses, a bioanalyzer, a Western-Blotting set, and a fully equipped molecular genetics laboratory.

The Institute has expertise in assessing environmental impacts (inventoring, biomonitoring, protection plans), water quality assessment, Water Framework Directive indicators (macroinvertebrates, vascular plants, benthos, plankton, physical & chemical properties), conservation genetics, molecular ecology, genetic and epigenetic analysis of plant and animal genomes, plant cytogenetics, Invasive Alien Species, astacid ecology and conservation, wildlife reintroductions and restitutions.

Offered expertise:

- taxonomy, ecology, phytogeography & biology of Ostracoda, Hydrachnidia & Odonata;
- morphology of water mite larvae & their parasitizing on aquatic insects;
- distribution & dispersion of aquatic invertebrates;
- noble crayfish ecology & conservation;
- conservation genetics;
- prevalence of parasitic infestation in birds;
- biological invasions of carnivores in Europe;
- behavioural ecology of urban population of the European Blackbird (Turdus merula);
- ethics of nature conservation & ethics of research on wildlife;
- genetic analyses at the population & species level, genetic diversity assessment;
- assessment of global methylation of plant & animal genomes;
- identification of genes responsible for pest and disease resistance in plants;
- study of genetic & epigenetic changes in hybrid plants;
- molecular analysis of grain quality - baking value of grain;
- DNA Barcoding;
- morpho-anatomical, habitat & genetic study of the genera Carex & Taraxacum & their hybrids;
- vegetation of river valleys - analysis of diversity, ecological conditions & conservation status of selected groups of plant communities;
- analysis of diversity & transformation of halophilous flora & vegetation in northern Poland;
- analysis of ecological & sociological conditions of bryophytes in Western Pomerania;
- analysis of changes in concentrations of allergenic fungal spores in the air.

Keywords specifying the offered expertise:

genetics, epigenetics, cytogenetics, molecular markers, GISH, FISH, mitochondrial and plastids' genomes, conservation genetics, molecular ecology, Ostracoda, Hydrachnidia and Odonata European Blackbird, European mink, Carex sp., Taraxacum sp., Invasive Alien Species

Food & Biotechnology

University of Szczecin
ul. Felczaka 3c
71-412 Szczecin
Poland
www.kb.wb.univ.szczecin.pl

Professor Jolanta Tarasiuk, Ph.D., D.Sc.

Faculty of Biology
Department of Biochemistry
e-mail: tarasiuk@univ.szczecin.pl
phone: +48 91 444 15 51

The scientific work of the Department of Biochemistry is focused on studying mechanisms of multidrug resistance (MDR) of tumour cells. The main goal of these studies is creation of a basis for rational design of antitumour compounds retaining the activity against MDR cells as well as development of new strategies to restore the activity of clinically important chemotherapeutic agents against MDR tumour cells.

The specific aims of our research involve:

- examination of the metabolic activation effect of antitumour compounds belonging to anthracycline antibiotics group as well as their synthetic anthraquinone derivatives and analogues on increasing activity against MDR tumour cells;
- evaluation of possibilities to restore apoptosis in MDR tumour cells by compounds belonging to the group of anthraquinone derivatives and their analogues;
- examination of antitumour activity of plant polyphenols;
- identification of key relationships between the MDR phenomenon of tumour cells and their invasion and metastasis potential;
- examination of the role of NF-κB in the development of MDR tumour cells' metastatic potential.

The infrastructure available at the Department of Biochemistry:

- high content bioimager system (BD Pathway™ 855);
- flow cytometer (BD FACSCalibur);
- microplate spectrophotometers (Synergy™ H1 monochromator-based multi-mode microplate reader and Biochrom Asys UVM340 Microplate Reader);
- real-time PCR cycler (Rotor-Gene Q, QIAGEN);
- systems for electrophoresis of nucleic acids and proteins and gel documentation system;
- HPLC system (Agilent/HP 1100 Series);
- ultra-deep freezer (-86°C) and dewar for storage the samples in liquid nitrogen (34 L);
- water jacket CO_2 incubator and laminar chamber (NuAire).

Offered expertise:

We offer scientific expertise in the area of multidrug resistance of tumour cells and experimental skills necessary for the use of equipment available at the Department of Biochemistry.

Keywords specifying the offered expertise:

tumour, multidrug resistance (MDR), anthracycline drugs and their anthraquinone derivatives and analogues, antitumour properties of plant polyphenols, metastatic potential of MDR tumour cells

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology, Szczecin
ul. Papieża Pawła VI 3
71-459 Szczecin
Poland
www.fizjologia-zywienia.zut.edu.pl

Professor Mariola Friedrich, Ph.D., D.Sc.

Department of Human Nutrition Physiology
e-mail: mariola.friedrich@zut.edu.pl
phone: +48 91 449 65 70

Research directions of the Department of Human Nutrition Physiology are focused on:

- evaluation of the effects of food composition on metabolism; the factors examined so far include supplementation with B groups of vitamins or/and chosen minerals, administration of selected food additives, high fructose syrup, new products in nutrition (energy drinks). Effects of those factors on: lipid and carbohydrate metabolism (fatty tissue accumulation, concentration of lipoproteins and apolipoproteins, glucose, triacylglycerols and cholesterol), chosen protein indicators in blood and tissues, free radical-related processes (contents of non-enzymatic components of antioxidation defence, activity of antioxidant enzymes and the total antioxidant status), hormonal status (corticosterone, insulin, thyroxine, estrogens, testosterone), water balance, calcium and magnesium metabolism;
- estimation of nutritional status and nutrition habits of different population groups (children – healthy, autistic, with Down syndrome, insulin-dependent mellitus, perimenopausal women, also with celiac disease or osteoporosis, blood donors);
- evaluation of effects of pro-health nutritional education on eating habits, body weight and body composition (amount and location of fat tissue and its loss) and selected blood parameters.

Offered expertise:

- evaluation and correction of nutritional habits;
- anthropometric assessment of nutritional status;
- health-promoting education, including principles of correct nutrition at different ages and in different physiological states;
- assessment of effects of diet composition on metabolism of rats.

Equipment:

- professional equipment for anthropometry (calibrated personal scales, Seca stadiometer, Gulick Baseline anthropometric tapes, Bodystat 1500 MDD and Maltron BF 906 apparatus for bioimpedance measurement, Harpenden callipers, Clevis Martina compass);
- air-conditioned vivarium with metabolic cages for rats for separate collection of urine and faeces;
- chemical and biochemical laboratory with Foss Tecator system for nitrogen and content analysis, spectrophotometer, turbidimeter.

Keywords specifying the offered expertise:
diet composition, metabolism, human nutrition, nutrition habits, nutrition state, pro-health nutritional education

West Pomeranian University of Technology, Szczecin
ul. Papieża Pawła VI 3
71-459 Szczecin
Poland
www.zut.edu.pl

Renata Matuszak-Slamani, Ph.D.

Andrzej Mila, Ph.D.

Professor Antoni Murkowski

Department of Physics and Agrophysics
e-mail: renata.matuszak@zut.edu.pl
phone: +48 91 449 64 46

Research of Department Physics and Agrophysics is focused on the functioning of plants under abiotic stress. The major abiotic stress factors investigated include salinity, drought, frost, UVB radiation and high irradiance as well as multistress interactions of those factors.

We are interested in the variability of biological characteristics and adaptation of plants to changing environmental conditions. The responses of plants are considered at different levels of organization; however, special attention is drawn to the process of C3 photosynthesis and its sensitivity to stress factors. We use biophysical non-invasive luminescence-based methods to evaluate plant response to stress factors.

Department of Physics and Agrophysics owns the following patents:

- a method and a measuring set for rapid assessment of phytoplankton concentration using delayed luminescence of chlorophyll;
- a method and a measuring set for determining frost resistance of plants.

The main topics of our research are:

- crops response to salinity and low temperature;
- plant response to water deficiency;
- the use of luminescence-based methods for assessing plant response to stress factors;
- evaluation of herbicide phytotoxicity;
- evaluation of impacts of various substances (NO, humic substances, CO_2) on crops growth and tolerance to stress factors.

The expertise offered includes:

- development and application of physiological and laboratory tests to evaluate crop sensitivity to abiotic stresses;
- selection of plant cultivars and species for resistance to abiotic stresses;
- evaluation of impacts of various substances (e.g. humic acids, CO2, NO) to increase the crops tolerance to stress factors;
- evaluation of herbicide phytotoxicity;
- conductivity-based measurement of electrolyte leakage and cell sap osmotic potential;
- measurement of plant photosynthesis efficiency by fluorescence- and delayed luminescence-based methods.

Department Physics and Agrophysics has a well-equipped chemical laboratories with:

- IR and UV-VIS spectrophotometers;
- a fluorescence spectrofluorometer;
- a spectroradiometer;
- a potentiometric titration set;
- an ultrafiltration set;
- a lyophilizer;
- an osmometer;
- a mineralization set;
- a TPS portable photosynthesis meter;
- a PAM-200 fluorometer;
- miniphytotrons;
- laboratory centrifuges with cooling.

Measurement sets constructed at Department of Physics and Agrophysics, West Pomeranian University of Technology in Szczecin:

- a set for measuring long-term delayed luminescence of humic substance solutions;
- a set for measuring ultra-weak biochemiluminescence (UBCL) of plant tissues;
- a set for measuring delayed luminescence of plant chlorophyll.

Keywords specifying the offered expertise:

abiotic stress, drought, salinity, frost resistance, chlorophyll fluorescence, delayed luminescence

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology, Szczecin
ul. Doktora Judyma 6
71-466 Szczecin
Poland
www.zut.edu.pl

Professor Iwona Szatkowska, Ph.D., D.Sc., Eng.
Andrzej Dybus, Ph.D., D.Sc., Eng.
Dr Magdalena Jędrzejczak-Silicka, Eng.

Faculty of Biotechnology and Animal Husbandry
Laboratory of Molecular Cytogenetics
e-mail: a.dybus@zut.edu.pl; m.jedrzejczak@zut.edu.pl
phone: +48 91 449 68 06
mobile: +48 605 897 744

The Laboratory of Molecular Cytogenetics (LMC) groups specialists whose research are mainly focused on the following topics:

- diagnosis of animal genetic diseases;
- identification of molecular genetic markers for animal breeding (e.g. the analysis of the influence of genetic factors on the composition of fatty acids in cattle milk);
- analysis of expression profile of genes potentially involved in regulation of sex determination and mechanisms responsible for sex development disorders;
- cell culture analysis (establishing primary cell cultures, mammalian cell line cultures);
- cytotoxicity analysis of nanomaterials (carbon nanotubes, graphene platforms, ferromagnetic nanoparticles).

The Department of Molecular Cytogenetics at the Institute of Ruminant Science, Faculty of Biotechnology and Animal Husbandry conducts research using molecular tools in the laboratory of molecular biology. The Department of Molecular Cytogenetics possesses cell culture facilities allowing to conduct studies with the use of cell cultures to develop adequate cell models of the mammary gland. The department collaborates also with the Department of Nanotechnology at the West Pomeranian University of Technology to assess, at the cellular level, the cytotoxicity of nanomaterials that could be used as anticancer drug carriers at advanced research stages.

The expertise offered includes:

- analyzing polymorphisms and genetic markers useful in genetic diseases diagnosis and animal breeding;
- real-time PCR analysis;
- evaluation of in vitro cell culture models;
- determining cytotoxicity and biocompatibility of materials tested.

Keywords specifying the offered expertise:
animal genetics, genetic markers, RFLP-PCR, real-time PCR, cell cultures, cytotoxicity

2

Nanotechnology, Materials & New Production Technologies

West Pomeranian University of Technology, Szczecin
al. Piastów 19
70-313 Szczecin
Poland
www.wimim.zut.edu.pl

West Pomeranian University of Technology Szczecin

Professor Anna Biedunkiewicz, Ph.D., D.Sc., Eng.

Faculty of Mechanical Engineering and Mechatronics
Institute of Materials Science and Engineering
e-mail: anna.biedunkiewicz@zut.edu.pl
phone: +48 91 449 40 71
mobile: +48 504 058 044

The Institute of Materials Science and Engineering (IMSE) and Institute of Mechanical Technology (IMT) group specialists working primarily on:

- innovative nanocomposite multifunctional materials (powders, coatings and volume materials, Metal Matrix Composites);
- manufacturing nanostructural carbides, borides and nitrides via sol-gel technique (TiC, TiN, TiB2, Mo2C, TiC-SiC-Si3N4, TiC-TiB2, microcapsules TiC-Mo2C);
- manufacturing nanostructural Metal Matrix Composites (MMC) using Rapid Prototyping and Selective laser Sintering and Melting Technologies (nc-TiC/Steel, nc-TiC/Ti, nc-TiC-TiB2/steel and others);
- modelling of nanocomposites using Final Element Method to determine stress distribution in heterogeneous or continuous structures;
- designing shape geometry and choosing the set of mechanical properties of material to ensure good interaction in the implant/tools/hydraulic parts-environment systems.

The group has:

- internationally recognized expertise in Materials Science/Chemistry/Engineering;
- developed a methodology for designing and modelling nanocomposite materials;
- developed their own original approach to a special subclass of composites – hetero-modulus ceramics, and has developed an original sol-gel method of synthesis of nanomaterials, nanocomposites in the form of powder and coatings in the Ti-Si-V- B-C-N-O system;
- has developed its own original approach to kinetic analysis of synthesis, oxidation, carbonization, and design of manufacturing technology for these nanocomposite materials;
- expertise in morphological, structural, mechanical, bio-tribo-corrosional characterisation of metallic, ceramic, polymeric and composite materials.

IMSE is involved in many international and national projects, and cooperates with different sectors of industry. The IMSCE research infrastructure consists of well equipped modern adapted to developing novel nanostructural composite materials using various coating techniques, morphological, mechanical and gas barrier characterization of metallic, ceramic, polymeric and composite materials.

The expertise offered includes:

- research on manufacturing nanostructural carbides, borides and nitrides via sol-gel technique in powders form (TiC, TiN, TiB2, Mo2C, TiC-SiC-Si3N4, TiC-TiB2, microcapsules TiC-Mo2C);
- manufacturing nanostructural Metal Matrix Composites (MMC) using Rapid Prototyping and Selective laser Sintering and Melting Technologies (nc-TiC/Steel, nc-TiC/Ti, nc-TiC-TiB2/steel and others);
- structural and morphological mechanical, bio-tribo-corrosional characterization of metallic, ceramic, polymeric and composite materials;
- modelling of the nanocomposites using Final Element Method to determine stress distribution in heterogeneous or continuous structures;
- designing shape geometry and selection of mechanical properties of materials to ensure good interaction in the implants/tools/hydraulic parts - environment systems;
- kinetic analysis of synthesis, oxidation, carbonization and other processes.

We have experience in Framework Programmes as a partner.

Keywords describing the expertise offered:

nanomaterials, Metal Matrix Composites, bio-tribo-corrosion resistance, Final Element Method, SLS/M, Rapid Prototyping

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology, Szczecin
al. Piastów 45
70-311 Szczecin
Poland
www.ip.zut.edu.pl
www.zbtm.zut.edu.pl

Professor Mirosława El Fray, Ph.D., D.Sc., Eng.

Faculty of Chemical Technology and Engineering
Polymer Institute
Division of Biomaterials and Microbiological Technologies
e-mail: mirfray@zut.edu.pl
phone: +48 91 449 48 28
mobile: +48 608 801 163

The Division of Biomaterials and Microbiological Technologies (DBMT) groups scientists strongly strongly focused on developing new polymers (elastomers, thermoplastics, hydrogels) and composite and nanocomposite materials, including new polymer matrices, mainly for biomedical applications. The DBMT research concerns a wide range of biomaterials and their applications to:

- polymeric implants – components of heart assisting devices, finger joints;
- biodegradable polymeric materials for tissue engineering;
- injectable biomaterials for soft tissue reconstruction;
- antimicrobial coatings for implants;
- drug delivery systems;
- graphene-based materials for diagnostic applications.

The DBMT strength is the synthesis of new materials including melt polycondensation of polyesters and random copolymers based on polyesters, polyurethanes and polycarbonates. These are biodegradable materials synthesized form nontoxic monomers (dicarboxylic acids, sugars, alcohols) for biomedical applications. The unique process of preparing nanocomposites with different nanoparticles in situ during polycondensation allows to obtain materials with enhanced mechanical properties at a very low nanofiller content (<0.5 wt.%).

The technology recently patented by DBMT concerns development of in situ-in vivo curable and adaptable materials for less invasive surgical techniques (laparoscopy, endoscopy) to be applied in surgery (soft and hard tissue), neurosurgery and orthopaedics. DBMT develops antibacterial coatings based on chitosan, fatty acids and amino acid derivatives. Such systems are also used to formulate nanoparticles for targeted drug delivery. DBMT works also on enzymatic synthesis of biodegradable condensation polyesters and polymer networks. The group has carried out many national and international research projects. and is currently involved in two 7the FP projects and many national ones. The DBMT infrastructure includes advanced testing systems as well as equipment for polymer and composites processing and characterization. The DBMT laboratories serve also for microbiological testing of new materials (some of them can be used as antibacterial coatings for implants).

The expertise offered includes:

- synthesis of different polymeric systems (from synthetic and natural monomers);
- preparation and characterization of polymers and (nano)composite systems with advanced methods (DSC, DMTA, TGA, ATR FT-IR, GPC, LSM, etc.);
- modification of nanofillers (graphene, silica, MTT, etc.) and polymer and (nano)composite processing (injection moulding, extrusion, RTM, etc.).

We have experience in Framework Programmes as a partner.

Keywords describing the expertise offered:

polymers, biomaterials, nanocomposites, tissue engineering, antimicrobial coatings, implants

Nanotechnology, Materials & New Production Technologies

West Pomeranian University of Technology, Szczecin
al. Piastów 48
70-310 Szczecin
Poland
www.if.zut.edu.pl

Professor Sławomir Kaczmarek, Ph.D., D.Sc., Eng.

Faculty of Mechanical Engineering and Mechatronics
Department of Optoelectronics, Institute of Physics
e-mail: skaczmarek@zut.edu.pl
phone: +48 91 449 48 87
mobile: +48 508 573 769

The Optoelectronics Group (OG) is a team of physicists interested in advanced spectroscopy applied to solid state physics based on known and new materials for optoelectronics. The OG research is primarily focused on:

- new crystal materials for laser matrices, phosphors and scintillators obtained by the Czochralski growth method (e.g. molybdates, tungstates, molybdato-tungstates);
- new nanopowders for optoelectronics (double tungstates, phosphates);
- characterization and monitoring of dielectrical, optical, magnetical properties of known and new materials and nanomaterials.

The OG research infrastructure consists of laboratories with facilities for crystal growth using Czochralski normal and high pressure methods (platinum and iridium crucibles), structural (XRD, TG-DTA), optical (UV-NIR), dielectric (EPR – X-band) characterisation of crystals, powders and nanopowders, also in terms of their magnetic susceptibility (SQUID). The equipment includes Czochralski pullers working at normal and high pressures, a Brucker EPR spectrometer, a spectrophotometer, a spectrofluorimeter, a Sawyer-Tower circuit, SQUID, X-ray diffractometer.

The expertise offered includes:

- application of crystal growth methods to grow new materials for laser matrices, phosphors and scintillators under conditions suitable for obtaining clear, transparent, defectless single cristals with properties promising for numerous applications;
- characterization of physical (optical, dielectric and magnetic) and chemical properties of crystals, powders and nanopowders.

Keywords specifying the offered expertise:

crystal growth, Czochralski method, high pressure, laser matrices, phosphors, scintillators, structure, XRD, optical spectroscopy, dielectric, magnetic

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology, Szczecin
al. Piastów 19
70-313 Szczecin
Poland
www.itm.zut.edu.pl

Professor Bartosz Powałka, Ph.D., D.Sc., Eng.

Faculty of Mechanical Engineering and Mechatronics
Institute of Manufacturing Engineering
e-mail: bartosz.powalka@zut.edu.pl
phone: +48 91 449 49 30
mobile: +48 664 299 270

Researcchers at the Institute of Manufacturing Engineering (IME) specialise in the construction and analysis of machines tools, machining technology and organization and scheduling of industrial operations. The major research areas include:

- dynamics of machine tools and cutting process;
- control algorithms for machine tool drives;
- modelling static and dynamic properties of machine tools;
- vision methods for evaluation of the machined surface quality and positioning applications;
- micromilling process;
- industrial operations scheduling;
- diagnostics and monitoring of the cutting process;
- modal analysis uncertainty;
- active vibration control methods.

The IME researchers have experience in modelling of the mass-spring-damping system of machine tools, experimental methods applied to machine tool performance evaluation, construction of machine tools, and active vibration control. The IME infrastructure includes LMS modal analysis system (software and hardware), Polytec laser vibrometer, vibration sensors, Kistler dynamometers, machine tools (e.g. 5-axis CNC milling center, CNC lathes), micromilling machine, CCD cameras, dSpace control card, FEM software, Labview system.

The expertise offered includes:

- modelling machine tool structure;
- vibration testing;
- design of machine tools;
- active vibration control;
- development of scheduling algorithms;
- development of machine vision systems;
- micromilling.

Keywords describing the expertise offered:

Machine tool dynamics, control systems, machine vision, micromilling, modal analysis, industrial operation scheduling

Koszalin University of Technology
ul. Racławicka 15-17
75-620 Koszalin
Poland
www.kpiups.wm.tu.koszalin.pl

Dr Tomasz Rydzkowski, Eng.

Dr Iwona Michalska-Pożoga, Eng.

Department of Food Industry Processes and Machinery
The Center of Food Packaging, Polymer Processing and Recycling Technology
email: tomasz.rydzkowski@tu.koszalin.pl
e-mail: iwona.michalska-pozoga@tu.koszalin.pl
phone: +48 94 347 84 24
phone: +48 94 347 84 25

The Centre of Food Packaging, Polymer Processing and Recycling Technology is an interdisciplinary group of specialists working within the Department of Food Industry Processes and Machinery. The research concerns primarily:

- vacuum and modified atmosphere packaging, with a particular application to food products (fresh vegetables, bread etc.);
- packaging materials and technology;
- active substances and indicators for and food product intelligent packaging systems;
- food-packaging interactions;
- polymer processing and recycling, with a particular emphasis on extrusion.

The Centre's infrastructure includes a Differential Scanning Calorimeter (DSC), microscopes, Melt Flow Rate analyser (MFR), Charpy Impact Tester (for Charpy and pendulum impact test), packaging machines (VAC, MAP), extruders, injection machine and other tools. As a group of experts who develop innovative, environmentally friendly solutions for industrial applications, the Centre collaborates with local industry and large companies to solve problems relating to packaging technology and materials.

The expertise offered includes:

- developing packaging systems for fresh vegetables, mushrooms, meat, poultry, bread and other foods;
- developing packaging technology for specific products, as requested by industry;
- developing technologies for processing and recycling of polyolefins;
- processing wood-polymer composites (WPC);
- identification, testing and processing of polymer materials;
- testing packaging materials;
- testing gas mixtures for food packaging applications;
- design of packaging systems (VAC, MAP);
- developing methods for recycling of polymer materials and wood polymer composites (WPC).

Keywords describing the expertise offered:

vacuum packaging, modified atmosphere packaging, active and intelligent packaging, packaging materials testing, effects of gas mixture composition on stored food quality, polymer extrusion, injection and recycling

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology in Szczecin
ul. Pułaskiego 10
70-322 Szczecin
Poland
www.wtiich.zut.edu.pl

Krzysztof Kowalczyk, Ph.D., D.Sc., Eng.

Faculty of Chemical Technology and Engineering
Department of Polymeric Materials Technology
Polymer Institute
e-mail: krzysztof.kowalczyk@zut.edu.pl
phone: +48 91 449 41 78

The Department of Polymeric Materials Technology (DPMT) carries out research on various aspects of polymeric materials preparation/development and characterization. The materials are based on thermoplastic polymers (mainly vinyl and acrylic) as well as reactive polymers and resins (epoxides, polyurethanes, unsaturated polyesters, polysaccharides oil-based alkyds) and include:

- polymer composites and nanocomposites (extrusion, infusion and prepreg technology, RTM technique of processing) with powdered and fibrous reinforcement;
- coating compositions and coats (UV-photocurable, protective, electroconductive, anticorrosive, intumescent systems);
- liquid and solid adhesives based on synthetic resins and bio-renewable polymers;
- polymer recycling and polymeric materials based on recycled products;
- starch-based polymeric materials (thickeners, surfactants, capsules and films, hydrogels, thermoplastic starch, biocomposites);
- nanofillers (montmorillonite/bentonite, carbon nanotubes, graphenes, nanophosphates) and their functionalisation for use in polymeric materials.

DPMT holds numerous Polish patents and collaborates with many SMEs.

The expertise offered coincides with fields in which cooperation is sought with research institutions and industry, that is in:

- polymer composites and coats based on thermoplastics and reactive resins, including those modified with nanofillers (aluminosilicates, nanophosphates, carbon nanotubes and graphenes) and/or fibrous reinforcement (glass, carbon, basalt, natural fibres);
- processing of reactive resins (epoxy and unsaturated polyester resins, polyurethanes), including composites with fibrous reinforcement;
- processing of thermoplastics via extrusion and injection moulding (compounding, etc.);
- starch chemical and physical modification (thermoplastic starch-based composites/nanocomposites, green plasticizers, carboxymethylstarch and their applications in various areas);
- nanofillers as polymers modifying agents (functionalisation of montmorillonite/bentonite, carbon nanotubes, graphenes); their dispergation/dissipation in polymeric systems;
- rheological evaluation of polymeric systems in liquid state (solutions, liquid resins, dispersions of fillers/nanofillers);
- scaling-up of polymer processes/technologies developed;
- compounding, application, curing and characterization (e.g. electrochemical and electrical investigations, accelerated corrosion tests, fire tests of intumescent systems) of organic coating compositions and coats for metallic, polymeric and wooden substrates;
- polymer sample preparation for electron microscopy;
- UV-Vis, FTIR and light scanning microscopic analyses;
- thermal and thermo-mechanical analysis of polymer materials (thermally and UV-initiated curing processes, thermoplastics behaviour, transitions, stability);
- mechanical testing of polymeric materials at low and elevated temperature.

We have experience in Framework Programmes as a coordinator and a partner.

Keywords describing the expertise offered:

reactive resins, thermo-mechanical and mechanical measurements, polymer processing, (nano)composites, nanofillers, starch-based functional polymers and biocomposites, varnish and paint formulation, coat characterisation, intumescent paints, corrosion

Nanotechnology, Materials & New Production Technologies

Maritime University of Szczecin
ul. Wały Chrobrego 1-2
70-500 Szczecin
Poland
www.am.szczecin.pl/en

Leszek Chybowski, Ph.D., CRP

Faculty of Marine Engineering
e-mail: l.chybowski@am.szczecin.pl
phone: +48 91 480 94 12
mobile: +48 607 288 978

Activities of the team concentrate on developing new technological solutions characterised by improved efficiency of utilising available resources (consumption of energy, work load and consumables) and minimising negative environmental impact. To achieve that the team uses a multidisciplinary approach and methods for creating, applying and managing innovation (TRIZ, USIT, DT, DFSS). Improved efficiency of the technical systems analysed will be achieved by changing the system structure (importance analysis, functional analysis, trimming, technical contradiction analysis etc.) and parameters of system components (innovative composites, metal foams, polymers etc.). The solutions developed can be used in transport and energy sectors and in industrial engineering. The objects under analysis are mainly ships and their elements, main engines included, auxiliary systems, safety systems, protection systems, and stationary power systems (diesel engines/alternators).

Offered expertise:

- applying methods for systematic generation of innovation (TRIZ, USIT, DT, DFSS etc.) to develop novel technological solutions;
- developing innovative construction materials (metal foams, composites, polymers);
- optimising the operation of machines, devices and equipment by modifying the system structure (importance/sensitivity analysis, reliability improvement);
- developing technical solutions and providing expert opinions in the area of materials and industrial engineering, transport and energy production.

Keywords specifying the offered expertise:

composites, metal foams, polymers, machinery, marine systems, offshore, coastal, vessels, diesel engines, fire protection, system structure, efficient & effective operation, marine environment, systematic innovation, TRIZ, machines

CARBON FOX Sp. z o.o.
Rajkowo 13F
72-005 Rajkowo, Poland
www.carbon-fox.com

Sławomir Gajdziński
Department CEO
e-mail: sg@carbon-fox.com; biuro@carbon-fox.com
phone: +48 91 460 01 08
mobile: +48 666 908 303

Carbon Fox is a pioneer and the Polish market's leader in a range of implementations and services related to biobase sandwich composites.
wThe main fields of activities include:

- distribution of the composite cork agglomerate;
- research and development on new applications of CoreCork, a natural, lightweight core material with controlled density and unique properties;
- implementation of AluCork in public transport to reduce vehicle weight, improve passenger comfort and apply economic solutions from the vehicle operator's viewpoint;
- development of new applications for PLYCORK, a concept with endless possibilities of bonding CoreCork with different materials, from carbon fibre to plywood, to obtain a composite with unexpected mechanical parameters;
- production and prototyping of rally composite parts;
- designing and manufacturing of vacuum systems;
- 3D printing;
- research and development on composite materials based on bonding methods, infusion vacuum bag, prepregs and combined methods of multi-layered composites, generating a uniform database on properties of functional composite materials including different cores in sandwich composites;
- cooperation in projects with leading technical universities;
- distribution of composite reinforcement materials: glass/carbon/aramid fibres, hybrid structures (fabrics, tapes etc.), resins and adhesives and ancillary materials and equipment for composite technology (resin track, vacuum net, heating chambers, brushes etc.).

Carbon Fox has a database of composite materials and equipment which allows to prepare and modify layered structures with appropriate standards for research and modelling needs. The laboratory infrastructure includes: a vacuum installation with full vacuum control, test stands for sample preparation equipped with forms made from layered glass, recorders of humidity and temperature during the process, a 3m^3 mobile heating chamber with heating process ramping.

The expertise offered includes:

- development and manufacture of biobase sandwich composites based on the Corecork natural cork agglomerate, with research and technology consulting for applications in, e.g. public transport, medicine, motosport, industry processing, machines, equipment and mechanics, energy industry, laboratory equipment, military/ defence industry, mining industry;
- manufacture of composite parts for motorcycles and race cars, made of epoxy composites reinforced with carbon, aramid and natural fibres (Dakar Parts);
- design and manufacture of vibration-absorbent composite parts;
- design and manufacture of moulds (we specialise in manufacturing moulds made of epoxy and polyurethane resins);
- design and manufacture of vacuum systems adjusted to the composite technology which guarantee a precise control of processing in infusion as well as in RTM, LRTM, fast RTM and which provide a full control of prepregs processing;
- design and manufacture of parts in 3D printing technology;
- research on composite properties: a typical studies we conduct involve determination of flexural properties/ tensile properties; we also carry out four-point bending test for fatigue cracking as well as acoustic and thermal properties;
- rapid prototyping of composite parts;
- cooperation and technology consulting in developing new composite applications.

Keywords specifying the offered expertise:

biobase sandwich composites, cork, Corecork, epoxy composites, carbon fibres, aramid fibres, Dakar Parts, vacuum systems, infusion, RTM, LRTM, fast LRTM, prepregs, 3D printing technology, rapid prototyping, autoclave

COPERNICUS Sp. z o.o.
ul. Litewska 10a
71-344 Szczecin
Poland
www.copernicus.net.pl

Daniel Matias, M.Sc., BME
Research and Business Development Department
e-mail: matias@copernicus.net.pl
phone: +48 91 486 35 86
mobile: +48 601 770 580

Copernicus is an innovative company specializing in the development and manufacture of drug delivery systems. We offer a complex range of activities needed for the introduction of a competitive drug delivery device: from the product design, through the manufacture of moulds and the plastic injection moulding till the product assembly and packaging. Copernicus is a vertically integrated organization where all the design and production processes are conducted within the company's departments:

- the Design & Development Centre engineering team consists of highly skilled experts – constructors, engineers, designers, quality specialists and medical professionals. The D&D Center at Copernicus has unique expertise in designing drug delivery systems where special attention must be paid to identification and proper implementation of features and functionalities contributing to the safety of the drug administration and the patient compliance;
- the Tooling Design Department specializes in designing and building plastic injection moulds. We use 3D modelling (CAD), CAM and high-res 3D printing. The range of activities conducted at our D&T Department includes surface grinding, CNC turning, CNC milling, CNC electro drilling, drilling, micro welding, hardening and any other works needed to manufacture prototype moulds and production molds – especially, at tooling complex parts requiring intricate mechanics, miniature parts (about 0,1 g) with close tolerances;
- the Molding Department is fully equipped for injection moulding and the equipment includes multidimensional molding machines and precision molding machines;
- the Device Assembly has an extensive assembly know-how and experience with semi-automated and automated manufacturing equipment. Our team of qualified personnel assembles components with specialized machines, under the supervision of quality control.

Offered expertise:

Drug delivery systems design and medical devices manufacturing (reusable pen injectors for pharmaceutical products, insulin pens) under the compliance with ISO 13485 and the Directive 93/42EEC; designing and building plastic injection moulds; 3D modelling and high-res printing; moulds prototype and production (surface grinding, CNC turning, CNC milling, CNC electro drilling, drilling, micro welding, hardening); precise miniature elements manufacturing (from 0,1 g weight); device assembly know-how and experience with semi-automated and automated manufacturing equipment.

Keywords specifying the offered expertise:

drug delivery systems, pen injectors, insulin pen injectors, drug delivery devices

GIPO.EU
UNLIMITED INNOVATION

GIPO Sp. z o.o.
ul. Bohaterów Warszawy 35
75-211 Koszalin
Poland
www.gipo.eu

Joanna Gołaszewska
Director
e-mail: jgo@gipo.eu
mobile: +48 698 609 500

Gipo Sp. z o.o. is a thriving manufacturing plant focusing on:
- innovative transportation lines (different types of conveyors, manipulators and product handling machines);
- automation and programming (delivery of complete systems with custom-made, easy to work on software);
- problem and task solving (solving problems in unique and simple way using experience and expertise on hand);
- manufacture of special machinery (design of drill platform air conditioners, special saws, modular chain assembly line);
- manufacture of parts (delivery of custom-made parts manufactured according to customers' specifications).

Gipo Sp. z o.o. has expertise in:
- design, mechanical engineering, automation of production process and product flow;
- project analyses, calculations and simulations of and stress;
- manufacture of parts and machine assembly;
- NDT control.

GIPO Sp. z o.o. has the most up-to-date engineering software necessary for complex, detailed and precise designs; we can run both static and dynamic simulations that assist in optimizing our products. Our staff working with modern workshop equipment (e.g. cutting laser, bending press, CNC machines, welding robots) is capable of manufacturing and implementing the solutions designed. GIPO is involved in many international projects and cooperates with a number of companies from different branches of industry. This gives us experience in handling large projects and collaborating with industrial partners.

Offered expertise:
GIPO offers a fully equipped workshop making it possible to develop prototypes and carry out tests needed in research. We also offer expertise in mechanical engineering and automatics as well as in programming.

Keywords specifying the offered expertise:
mechanical production; assembly; mechanical engineering; automatics and programming

PARTNER-SHIP
ul. Ludowa 16
71-700 Szczecin
Poland
www.partner-ship-poland.com

Krzysztof Ozygała
General director
e-mail: krzysztof.ozygala@partner-ship.pl
phone: +48 91 462 52 00
mobile: +48 502 151 838

The Partner-Ship company was founded on 1 August 2004. It is a modern company which specialises in metal work and plastics processing. We have a large well-equipped machinery mechanical workshop. The company's key advantage is a highly qualified team with many years of professional experience. We deal with orders for shipbuilding, harbour, construction, energy, petroleum, military, mining, railway industry, and other branches of the machine industry.

Offered expertise:
We do our best to fulfil individual orders. We develop prototypes of parts, enclosures, components, machinery components and entire machines and equipment ordered by the customers. Based on customers' specification, we manufacture elements listed above as single units, small lots or as mass production. Machines and equipment as well as sub-assemblies we receive are frequently in a state ruling out further use. We refurbish them and additionally design different the customers find useful and necessary.

Keywords specifying the offered expertise:
metalwork, plastics processing, steel structures, designing

Manufacturer of construction chemicals PIGMENT
General Partnership R. Bielak, J. Bielak

ul. Pyrzycka 23A
70-892 Szczecin
Poland
www.pigment.inet.pl

Magdalena Pamula

Sales
e-mail: magda.pamula@pigment.inet.pl
phone: +48 91 462 10 20
mobile: +48 695 099 265

PIGMENT is an independent Polish manufacturer of construction chemicals with a wide range of products which have been, for over 40 years, recognised by domestic and international customers. The products include: interior and facade, latex, acrylic, silicone, silicate, and epoxy paints and coatings, plastering mixtures and coats, water-resistant and putty mixtures, impregnates and varnishes.

On account of the quality of products and flexibility and individualised approach to customers, the company competes successfully with much larger manufacturers of construction materials. It combines expertise, gained through long-term business activities, with cooperation with external R&D centres and laboratories, both domestic and foreign. Through contacts with leading European suppliers of raw materials, the company improves the quality of products and systematically expands its portfolio.

By investing in technological capabilities and establishing a partnership with the West Pomeranian University of Technology in Szczecin, the company was able to achieve the status of an innovative company and to produce a photocatalytic paint, never manufactured in Poland before. Very few manufacturers of such products operate in Europe, too.

In recognition of these achievements, the company received the Economic Award of the President of the City of Szczecin in 2009. In 2015, the company received the distinction of Perła Biznesu (Business Pearl) for launching innovative construction materials. But PIGMENT stands not only for business activities. It is also active in nature conservation (acknowledged as the 2014 West Pomeranian Ecology Leader) and in community activities.

Keywords specifying the offered expertise:
chemicals, paints, photocatalytic, screeds, interior, facade, latex, acrylic, silicone, silicate, epoxy, coatings, plastering mixtures, coats, water-resistant, putty mixtures, impregnates, varnishes, enamels, hygienic, anti-graffitti

West Pomeranian University of Technology in Szczecin
al. Piastów 19
70-310 Szczecin
Poland
www.zut.edu.pl

Marcin Chodźko, Ph.D., D.Sc., Eng.

Faculty of Mechanical Engineering and Mechatronics
Department of Mechatronic Systems
e-mail: marcin.chodzko@zut.edu.pl
phone: +48 91 449 44 30
mobile: +48 697 624 667

Researchers at the Department of Mechatronic Systems (DMS) specialise in construction and analysis of static and dynamic properties of machine tools, machining technology and in a wide area of measurement applications.

The major research areas include:

- dynamics of machine tools and cutting process;
- modelling of static and dynamic properties of machine tools;
- accuracy and repeatability tests of machine tools;
- diagnostics of machines;
- dynamics of civil structures;
- experimental and operational modal analysis;
- vibration minimisation techniques;
- measuring of vibrations (displacement, velocity, acceleration);
- observation of short time phenomena using high speed cameras.

Offered expertise:

The DMS researchers have experience in modelling of mechanical systems such as machines, robots, machine tools. Additionally, they have experience in testing civil structures such as buildings, bridges etc. They have deep knowledge on and experience with measuring different physical properties such as force, displacement, velocity, acceleration. The DMS infrastructure includes: LMS modal analysis system with various types of PCB sensors and Modal Shop exciters, Kistler force sensors. Additionally, DMS researchers use 3D Polytec Scanning Vibrometer and high speed camera Phantom V710 with max acquisition (frame per second, fps) up to 800 000 in reduced resolution.

Keywords specifying the offered expertise:

machine tool dynamics, modal analysis, vibration, measurements, high speed camera, vibrometry

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology in Szczecin
ul. Pułaskiego 10
70-322 Szczecin
Poland
www.psat.zut.edu.pl

Professor Zbigniew Czech, Ph.D., D.Sc.

International Laboratory for Adhesive and Self-Adhesive Materials
e-mail: psa_czech@wp.pl
phone: +48 91 449 49 03
mobile: +48 601 057 477

The International Laboratory for Adhesive and Self-Adhesive Materials (ILASAM) is the first-of-the-kind laboratory in Poland, employing highly qualified specialists with research, development, application and industrial experience in adhesive and self-adhesive materials. The International Laboratory for Adhesive and Self-Adhesive Materials (ILASAM) is focused on research, development, application, and cooperation with Polish and internationals companies. We have developed commercial products for BASF, Novamelt and Dyneon. We conduct innovative research, novel development and technology in new pressure-sensitive adhesive materials highly efficiently with modern coating techniques. To modify and completely characterize all the novel materials tested, we select appropriate research, development, services, and technology steps for each project and each practical application. Our core competence in adhesives and pressure-sensitive adhesives is an in-depth knowledge of polymer-based organic chemistry. Intensive research and development in both fields has resulted in products which further extend the range of products available.

The International Laboratory for Adhesive and Self-Adhesive Materials (ILASAM) addresses focused the following topics:

- synthesis and modification of solvent-based pressure-sensitive adhesives based on acrylics;
- synthesis and modification of solvent-borne pressure-sensitive adhesives based on acrylics;
- synthesis and modification of solvent-based water soluble pressure-sensitive adhesives based on acrylics,

and their application for manufacturing water-dispersible splicing tapes used in paper industry;

- synthesis of photoreactive solvent-free acrylic PSA;
- manufacturing self-adhesive thermally curable structural PSA tapes;
- self-adhesive hydrogels for medical applications and bonding of wet surfaces;
- biodegradable water-soluble pressure-sensitive adhesives;
- water-soluble self-adhesive printable paper labels;
- synthesis of novel crosslinking agents;
- synthesis of unsaturated copolymerizable radical photoinitiators;
- development of thermally resistant silicon splicing tapes.

The International Laboratory for Adhesive and Self-Adhesive Materials (ILASAM) is strongly involved in a wide range of UV technology applications:

- UV-crosslinkable photoreactive acrylic hot-melts;
- UV-crosslinkable solvent-based acrylic PSA for technical and medical applications;
- solvent-free UV-crosslinkable Low Viscosity Systems (LVS) based on acrylics coatable at room temperature;
- manufacturing 1-2 mm thick (1000-2000 g/m^2) PSA transfer carrier-free tapes;
- UV-cured varnishes and lacquers;
- UV-cured dental materials;
- practical applications in the LED technology.

Offered expertise:

Analysis of commercial products and their alternative replacements. Modification of a wide range of pressure-sensitive adhesives in the form of solvent-based, water-borne or solvent-free PSA systems for improving their performance. Measurement of tack, peel adhesion, shear strength and shrinkage of various PSA systems. Comparative analyses of PSA tapes developed and manufactured by us with competitive products using IR spectroscopy, including a few thousand basic polymers, adhesives, pressure-sensitive adhesives, resins, tackyfiers, photoreactive additives, plasticizers and other commercial additives.

Keywords specifying the offered expertise:

UV-technology, pressure-sensitive adhesives, acrylics, UV-crosslinkable, dental materials

West Pomeranian University of Technology in Szczecin
al. Piastów 50
70-311 Szczecin
Poland
www.kfbimb.zut.edu.pl

Professor Halina Garbalińska, Ph.D., D.Sc., Eng.

Faculty of Civil Engineering and Architecture
Department of Building Physics and Building Materials
e-mail: halina.garbalinska@zut.edu.pl
phone: +48 91 449 42 91

The Department of Building Physics and Building Materials (DBFBM) groups specialists working primarily on:

- innovative cement based materials;
- the influence of admixtures and additives on properties of mortars and concretes;
- testing physical and mechanical properties of various kinds of building materials;
- capillarity and sorption of building materials;
- simulations of thermal behaviour of partitions and whole buildings;
- optimization of low energy buildings and passive houses.

Our team has extensive experience in managing both national and international research projects. We cooperate also with construction industry. The infrastructure of DBFBM makes it possible to perform high quality research according to Polish and European standards. Our Department has well-equipped modern laboratories and rich experience related to testing a wide variety of building materials.

We are equipped with the following research infrastructure:

- a guarded hot plate apparatus and Isomet 2104 for thermal tests;
- a SEM microscope and EDS;
- a salt chamber for corrosion tests;
- thermographic cameras and blower door equipment;
- a stand for water tightness test for concretes;
- optic and mercury porosimetry test stands;
- the Blain apparatus;
- a pull-off apparatus;
- a bending and compression testing machine;
- a high-temperature furnace.

The expertise offered includes:

- hygrothermal test of building materials (especially mortars and concretes);
- structural and elemental tests of materials (optic, SEM, EDS);
- pore structure tests (optic and mercury porosimetry);
- mechanical testing of building material properties;
- blower door and IR camera tests;
- on-site core sampling and testing of concrete;
- energy audits of buildings;
- optimization of energy consumption of buildings.

Keywords specifying the offered expertise:

building physics, thermographic and blower door tests, building materials, SEM and EDS analysis, mercury porosimetry, strength tests, heat and moisture tests

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology in Szczecin
ul. Piastów 19
70-310 Szczecin
Poland
www.kmpkm.zut.edu.pl

Rafał Grzejda, Ph.D., Eng.

Faculty of Mechanical Engineering and Mechatronics
Division of Machine Design Fundamentals
e-mail: rafal.grzejda@zut.edu.pl
phone: +48 91 449 49 69

Researchers of the Division of Machine Design Fundamentals (DMDF) are a group of experienced specialists working in the field of investigations on complex mechanical structures.

The DMDF research activities focus mainly on the following issues:

- FE-modelling of mechanical systems (such as multi-bolted connections, foundation bolted joints);
- FE-modelling of machine temperature fields and thermal expansion values;
- modelling of contact joints in complex structures;
- experimental studies using mechanical equipment;
- thermal measurements with the use of professional IR cameras;
- non-destructive testing using the active thermography method.

The DMDF research infrastructure contains:

- multi-purpose testing machines (including INSTRON 8850, INSTRON 8501 Plus);
- instrumentation for optical 3D measurements of deformations and displacements (ARAMIS);
- a professional IR camera (FLIR sc640).

The DMDF researchers have extensive experience in FE-modelling using ANSYS and Midas NFX software for static, dynamic and thermal analyses. The DMDF researchers took part in several national research programmes.

The expertise offered includes:

- FE-modelling of static and dynamic properties of mechanical systems;
- analysis of nonlinear mechanical systems;
- design of mechanical systems;
- experimental testing of mechanical systems;
- thermal and optical measurements.

Keywords specifying the offered expertise:

mechanical systems, multi-bolted connections, foundation bolted joints, contact joints, finite element method, active thermography, mechanical measurements, optical measurements, thermal measurements

West Pomeranian University of Technology in Szczecin
al. Piastów 19
70-310 Szczecin, Poland
www.wimim.zut.edu.pl

Dr Anna Szymczyk, D.Sc., Associate Professor
Dr Sandra Paszkiewicz
Dr Elżbieta Piesowicz

Faculty of Mechanical Engineering and Mechatronics
Institute of Materials Science and Engineering
e-mail: anna.szymczyk@zut.edu.pl
phone: +48 91 449 44 05

The Institute of Materials Science and Engineering (IMSE) research activities are mainly focused on the following:

- innovative multifunctional polymer-based nanocomposites prepared via in situ polymerization [polymer matrix nanocomposites containing organic (carbon nanotubes, graphene derivatives and the mixture of both) and inorganic (clays (MMT), POSS etc.]; investigation of the influence of nanofiller addition on the morphology and phase structure of polymers and composites;
- thermoplastic elastomers based on both synthetic and renewable monomers for engineering and biomedical applications;
- preparation and characterization of multiphase polymer systems;
- investigation of structure-property relationships in semicrystalline thermoplastic polymers;
- chemical and physical properties of rubber, and rubber processing.

IMSE addresses interactions between nanofillers and the matrix, the topic being a result of international cooperation within the 5th Framework Programme project "Carbon Nanotubes for Future Industrial Composites: theoretical potential versus immediate application" (CNT-Net). IMSE was a co-ordinator of the international project APGRAPHEL within the MNT ERA NET program. IMSE is at present involved in several national projects: development and preparation of a new elastomeric material based on reactive/compatibilized polymer blends (Innotech) and the development of the recycling technology of postconsumer polymeric material of cycloaliphatic glycol-modified PET (PET-G) (GEKON).

IMSE offers the following expertise:

- laboratory-scale synthesis of polycondensation polymers;
- preparation and characterization of polymer nanocomposites based on polycondensation polymers;
- study of supermolecular structure of polymers;
- evaluation of the physical properties of rubber, plastic and elastomer materials;
- study of thermal and thermo-oxidative stability of polymer materials;
- evaluation of engineering properties of polymer composites.

Offered expertise:

Polymer nanocomposites (manufacturing, characterization, properties); bio-based materials (PTF, PLA, PEG, etc., block copolymers based on PTF, PLA, PEO, PCL etc.); thermoplastic elastomers (polymerization, blending, thermoplastic polyesters, polyolefin, characterization, modification/improvement of mechanical properties, assigning new/functional properties, i.e. electrical and thermal conductivity etc.); multiphase polymer systems (synthesis, characterization of supramolecular structure); new polymer materials for biomedical applications.

Modern infrastructure: both chemical and engineering laboratories, equipment: a 1 dm^3 capacity polycondensation reactor (Autoclave Engineers, Pennsylvania, USA); a sonicator; a high-speed stirrer (Ultra-Turax T25); a Brabender mixer; a BOY15 laboratory injection molding machine; a Leistritz Laborextruder LSM30 L/D=22,9 twin screw extruder; a COLIN P200E plate press; an MFR/MVR Ceast 6841.000 equipment; an X-ray diffractometer (X'Pert PRO Philips); an SEM (JEOL type JSM-6100); AFM (Veeco, Nanoscop IVa); a CP-411 EL-METRON water-resistant pH-meter; a RADWAG MAX 60/NP Moisture Analyzer; INSTRON 3366; a Shore hardness tester (Zwick); a Charpy hammer (Zwick); an SDT Q600 thermoanalyzer (TA Instruments) coupled with a Thermostar GSD 301 mass spectrometer (Pfeiffer Vacuum); a KKP 115 TOP climatic chamber; a FTIR JASCO FT/IR-440 spectrometer.

Nanotechnology, Materials & New Production Technologies

Keywords specifying the offered expertise: ***polymer nanocomposites, thermoplastic elastomers, rubber, polyolefin, multiphase polymer systems, in situ polymerization, materials processing, bio-based materials, structure-property relationships***

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology in Szczecin
al. Piastów 41
71-065 Szczecin, Poland
www.wtmit.zut.edu.pl

Professor Stefan Weyna, Ph.D., D.Sc., Eng.

Faculty of Maritime Technology and Transport
e-mail: weyna@zut.edu.pl
phone: +48 91 449 45 38
mobile: +48 609 085 339

The Applied Vibro-Acoustic Department is involved in many international and national projects, contributing its experience in the development of innovative research techniques. Our applied research techniques are the vector distribution analysis of acoustic fields generated by sources in the real-live conditions and the creation of spatial visualization of the acoustic wave response to the obstacles on the way of its propagation. Experiments are carried out research laboratory methods in real conditions using an innovative methods, such assound intensity SI and laser PIV, LDA), for analysis of the acoustics wave flow as the acoustic energy or noise flux in the sound field. The distribution acoustic field is presented graphically on the 2D plane or in 3D space as a sound intensity maps, acoustic energy flux lines, shapes of the travelling acoustic wave or as a spatial distribution of intensity izosurfaces.
Our research are directed to enrich knowledge to better understanding of the noise generation by real sources as an air condition installations, turbo-machinery, pump, fans (HAVAC systems) to identify more effective ways of noise reduction. New testing methods improve and develop modern diagnostic techniques used machinery and mechanical appliances conducted acoustic methods. They also have a crucial importance in the validation of computer simulations, which often differ significantly from results recorded in the real. Application of the sound intensity and non-invasive laser methods, including the presentation of space vector distribution of acoustic power, brings new insight into theory and the nature of acoustic field formation. which will facilitate to make good decisions to optimalization construction and technology of industrial products.

The AV-AD has well equipped modern laboratory:

- ship acoustics (muck-up superstructure in scale 1:1);
- semi-anechoic chamber;
- laser anemometry research stands (equipment: PIV and LDA systems);
- acoustic flow graphics studio.

With application of sound intensity and laser anemometry measurement AV-AD team offered expertise of:

- sound power of sources;
- sound energy transmission through partitions (vectors field distributions);
- identification and location of acoustic sources;
- measurement of transmission loss, sound absorption, specific acoustic impedance, etc.;
- measurement and graphical presentation of the sound energy flow in near and far acoustic fields;
- graphically mapping scattering, interference or reflected acoustic waves in real environmental fields;
- experimental study of acoustic power flow inside and outlet of the ducts and pipes;
- experimental validation of numerical modeling results from platforms CFD, FSI, CAA using innovation measurement techniques (SI, PIV, LDA).

Research activity in ship acoustic laboratory:

- vibro-acoustic investigation in dynamic conditions (testing technology and construction) for the natural size ship cabin built inside a mock-up superstructure;
- vibro-acoustic characteristics for separate natural size cabin partitions; bulkheads, ceilings and floors;
- structure borne and air borne transmission loss, insertion loss, sound radiation efficiency, etc.;
- measurements and mapping the acoustic power radiated by cabin partitions using Sound Intensity Method;
- measurements of vibration and noise level of ship mechanism and noise inside ship accommodations (structure-borne and airborne noise with flanking transmission, measured on board or during trial trip).

Keywords specifying the offered expertise:
sound intensity, laser PIV/LDA, flow acoustics, acoustic imaging, acoustics wave guide

West Pomeranian University of Technology in Szczecin
ul. Pułaskiego 10
70-322 Szczecin
Poland
www.itcho.zut.edu.pl

Dr Agnieszka Wróblewska, Ph.D., D.Sc.

Department of Organic Chemical Technology
Institute of Organic Chemical Technology
e-mail: agnieszka.wroblewska@zut.edu.pl
phone: +48 91 449 48 75

The Department of Organic Chemical Technology groups specialists working on applications of zeolite and zeolite–like catalysts in organic chemical process, especially in oxidation and isomerization reactions with utilization of organic natural raw materials of plant origin.

The Department of Organic Chemical Technology is primarily focused on:

- syntheses zeolite and zeolite-like materials, especially TS-1, ZSM-5, TS-2, Ti-BETA, BETA, Ti-MCM-41, MCM-41, Ti-MCM-48, MCM-48, Ti-MWW, MWW, Ti-YNU-1 and other, by the hydrothermal method or by the direct precipitation method;
- applications of zeolite and zeolite-like materials in oxidation and isomerization reactions such organic raw materials as: limonene (obtained from orange peels), a-pinene (obtained from turpentine) or eugenol (obtained from clove oil) – the products of these reactions found applications in medicine (anticancer drugs), in perfume industry (flavour agents), in cosmetic industry (flavour and antibacterial additives) and in food industry (taste additives);
- applications of zeolite and zeolite-like materials in epoxidation of allylic compounds, especially allyl alcohol;
- applications of heterogeneous catalysts obtained on the basis of active carbon, with such metals atom as: Fe, Mo, Ti in oxidations reactions;
- optimization of organic processes with help of method of experiment design;
- characteristic of zeolite and zeolite-like materials with help of UV-VIS and IR methods.

Offered expertise:

- preparation of zeolite and zeolite-like materials;
- syntheses new zeolite materials;
- characteristic zeolites;
- optimization of organic processes, especially oxidation and isomerization process;
- gas chromatography analyses;
- separation compounds from plant material.

Keywords specifying the offered expertise:
zeolites, oxidation, isomerization, epoxidation, compounds of natural origin

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology in Szczecin
ul. 26 Kwietnia 10
71-126 Szczecin
Poland
www.foton.zut.edu.pl/en/laboratories/lope

Andrzej Ziółkowski, Ph.D., Eng.

Faculty of Electrical Engineering
Laboratory of Photonic Devices
e-mail: andrzej.ziolkowski@zut.edu.pl
phone: +48 91 499 51 03
mobile: +48 505 996 650

The Laboratory of Photonic Devices (LPD) is a part of a larger research facility, the Laboratory of Teleinformatic Technologies and Photonics within the Faculty of Electrical Engineering. It is a facility where specialists pursue research on modern optical materials and devices.

LPD's research activities are mainly focused on applications of non-linear optical phenomena for fully optical signal processing, which include:

- examination of semiconductor structures on quantum wells (slab and strip waveguides, holographic structures, detectors and others);
- non-linear phenomena in photorefractive materials;
- spatial and temporal solitons.

LPD has a modern equipment, including:

- a tunable titanium-sapphire MIRA HP oscillator (Coherent) generating femto- and picosecond pulses, coupled with a parametric MIRA OPO oscillator, which makes it possible to obtain a wide spectrum (500-1600 nm) with an option of pulse management with a pulse picker;
- a titanium-sapphire MBR 110 laser (Coherent), with continuous-wave mode, tuned within 700-1000 nm wavelength range, generating light with a linewidth below 5 MHz;
- two antivibration optical tables with an active vibration damping system.

Offered expertise:

Optical characterization and properties of semi-insulating semiconductors such as proton implanted gallium arsenide or based on gallium arsenide quantum well structures. Characterization of optical propagation in a slab and strip waveguides. Generation and interactions of spatial solitons.

Keywords specifying the offered expertise:

photonic devices, optical characterization, semi-insulating semiconductors, non-linear phenomena, photorefractive materials

West Pomeranian University of Technology in Szczecin
ul. Pułaskiego 10
70-322 Szczecin
Poland
www.itn.zut.edu.pl; www.wtiich.zut.edu.pl

Rafał Pelka, D.Sc., Eng.

Faculty of Chemical Technology and Engineering
Institute of Chemical and Environmental Engineering
Division of New Materials and Catalysis
e-mail: r.pelka@zut.edu.pl
phone: +48 91 449 41 32

Department of New Materials and Catalysis comprises a group of specialists working primarily on:

- innovative, nanocrystalline, multifunctional materials (nanomaterials, nanocatalysts, metal composites);
- formation of nanostructrural nitrides, carbides and oxides of metals via gaseous technique (MeN, MeC, MeO, Me - e.g. Fe, Co, Mo);
- production of nanostructural catalysts using self-developed annealing and melting technologies;
- modelling of reaction kinetics in a gas–nanocrystalline material system using The Adsorption Range Model;
- characterisation of nanocrystalline materials using the Chemical Potential Programmed Reaction.

The group has:

- internationally recognized expertise in Materials Science/Engineering/Chemistry;
- developed methodology for designing and modelling nanocrystalline materials;
- developed their own original approach to the nanocrystallite/grain size distribution method;
- developed their own original approach to kinetic analysis of synthesis, nitriding, carburisation, oxidation and design of manufacturing technology for nanocrystalline materials;
- expertise in morphological and structural characterisation of materials, e.g. nanomaterials, ceramics, polymers, composites.

The expertise offered includes:

- research of manufacturing nanostructural nitrides, carbides, oxides;
- manufacturing nanocrystalline catalysts;
- morphological and structural characterisation of materials;
- modelling reactions in a gas–nanocrystalline material system;
- design of nanocrystallite/grain size distribution;
- kinetics analysis of synthesis, nitriding, carburisation, oxidation and other processes.

Keywords specifying the offered expertise:
nanomaterials, thermodynamics, modelling, manufacturing, kinetics, catalysis

3

Health

Pomeranian Medical University, Szczecin
al. Powstańców Wielkopolskich 72
70-111 Szczecin
Poland
www.pum.edu.pl

Dr Jeremy Clark B.A.(Hons) CANTAB, Ph.D., P.G.C.E.

Faculty of Laboratory Diagnostics and Molecular Medicine, Department of Clinical and Molecular Biochemistry,
Centre for Methodology in Medical and Biological Research
e-mail: jeremyclarkmel@gmail.com
phone: +48 91 466 15 06, +48 91 466 14 90
mobile: +48 511 677 484

The Centre for Methodology in Medical and Biological Research (CMBiB), including Biostatistics is an interdisciplinary group of doctors, scientists and statisticians cooperating between several universities, with the aim of increasing communication between these disciplines, especially in regard to the assessment of proposed research project designs (i.e. before a project starts).

CMBiB intends to overcome some systemic problems found in medical science by:

- increasing contact between doctors and scientists who have had extensive training and a thorough understanding of modern scientific principles, especially statistics;
- increasing support for studies with sufficient numbers of study subjects (rather than the historically-based reliance on anecdotal evidence);
- providing an interactive web questionnaire allowing effective traverse through the complex set of research design choices dictated by ethical considerations;
- providing contact with expert statisticians, with access to the explosion of statistical techniques available, before a project starts.

As more communication is needed between doctors, scientists and statisticians, especially with regard to assessment of research projects before their implementation commences, CMBiB is to function as a network of experts with links between several departments in other universities, specifically with the aim of developing protocols for assessment of proposed project designs.
The CMBiB infrastructure includes access to computer facilities with a high-speed Linux 4 processor.

The expertise offered includes:

- extensive experience in medical and biological sciences, including many years' experience with many types of medical project designs and statistical analyses of data from clinical, genetic, physiological, pathological and epidemiological studies as well as biobanking;
- video-conferencing and inter-university infrastructure for secure network communication;
- interactive web-site development;
- coordination.

Keywords specifying the offered expertise:
network of doctors, scientists and statisticians, communication, biobanking, secure networking

Pomeranian Medical University, Szczecin
al. Powstańców Wielkopolskich 72
70-111 Szczecin
Poland
www.pum.edu.pl

Professor Barbara Dołęgowska, D.M., D.Sc.

Department of Medical Analysis
Laboratory of Stem Cell Physiology and Biochemistry
e-mail: barbara.dolegowska@pum.edu.pl
phone: +48 91 466 15 08

Department of Medical Analysis (DMA) and Laboratory of Stem Cell Physiology and Biochemistry (LSCPB) group specialists working with bioactive lipids whose research focuses primarily on:

- metabolism of arachidonic acid and other PUFAs (eicosanoids, endocannabinoids, HETEs, EETs, enzymes, receptors);
- sphingolipid metabolism (sphingosine-1-phosphate, sphingosine, ceramide-1-phosphate, ceramides, enzymes, receptors);
- dynamics of changes in platelets and plasma bioactive lipids (AA derivatives and sphingolipids), including levels in patients suffering from CRF stage 4 or 5 (as classified according to the Kidney Disease Outcomes Quality Initiative, K/DOQI, scale) and levels in healthy individuals (controls);
- plasma bioactive lipids (sphingolipids) in psychiatric disorders;
- oxidative stress analysis (isoprostanes, antioxidative enzymes);
- laboratory diagnostics (clinical biochemistry, hemostasis, hematology, immunochemistry).

DMA and LSCPB are involved in international and national projects.

The research infrastructure of DMA and LSCPB includes modern laboratory facilities for conducting assays bioactive lipid (AA derivatives and sphingolipids) levels in plasma and other biological materials; antioxidative enzymes in plasma, platelets, erythrocytes, and to perform a wide range of medical analyses with equipment such as HPLC MS, FPLC, Raman microscopy, microscopy, spectrophotometers, plate aggregation analyser (Multiplate), hematology analyser, and Multilabel Plate Reader (EnVision).

The expertise offered includes:

- analysing metabolism of arachidonic acid and other PUFAs (eicosanoids, endocannabinoids, HETEs, EETs, enzymes, receptors) and sphingolipids (sphingosine-1-phosphate, sphingosine, ceramide-1-phosphate, ceramides, enzymes, receptors);
- analysis of oxidative stress (isoprostanes, antioxidative enzymes;
- laboratory diagnostics (biochemistry, hemostasis, hematology, immunochemistry).

Keywords specifying the offered expertise:

bioactive lipids, oxidative stress, clinical biochemistry, hemostasis, hematology, immunochemistry

Health

Pomeranian Medical University, Szczecin
al. Powstańców Wielkopolskich 72
70-111 Szczecin
Poland
www.pum.edu.pl

Joanna Janiszewska-Olszowska, M.D.

Chair and Department of General Dentistry
e-mail: jjo@pum.edu.pl
phone: +48 91 466 16 90

Chair and Department of General Dentistry (CDGD) groups dentistry specialists whose research focuses on:

- dental caries and periodontal prophylaxis (fluoride, hydroxyapatites, nanohydroxyapatites, early caries diagnosis and treatment);
- diagnosis and treatment of craniofacial deformities (including clefts);
- interdisciplinary dental treatment (cooperation between orthodontist, general dentist, restorative dentist, dental surgeon and periodontologist);
- minimizing detrimental effect of bonding orthodontic attachments to the enamel.

The CDGD research infrastructure includes dental units and digital dental radiography.

The expertise offered includes:

- analysing mineral composition of saliva, enamel and dentin;
- assessing long-term effect of surgical procedures for the treatment of facial clefts;
- describing craniofacial morphology in facial clefts;
- investigating application of nanocomposites and other nanomaterials in dentistry;
- genetic background of gingival overgrowth associated with immunosuppression;
- clinical assessment of dental materials and treatment methods;
- radiological examination of materials and treatment results.

Keywords specifying the offered expertise:

dental instruments, dental equipment, dental materials, nanomaterials, grinding, caries prophylaxis, periodontal prophylaxis, periodontal regeneration

Pomeranian Medical University, Szczecin
al. Powstańców Wielkopolskich 72
70-111 Szczecin
Poland
www.pum.edu.pl

Professor Elżbieta Kalisińska, Ph.D., D.Sc.

Department of Biology and Medical Parasitology
e-mail: ekalist@pum.edu.pl
phone: +48 91 466 16 72

The Chair and Department of Biology and Medical Parasitology (CDB&MP) is an interdisciplinary group of specialists working within the Faculty of Medicine, Biotechnology and Laboratory Medicine.

The CDB&MP's research activities are primarily focused on:

- ecotoxicology and toxicology (effects of trace elements, including heavy metals, on humans and animals);
- epidemiology of human parasites;
- physiological and biochemical aspects of the parasite-host system.

The CDB&MP research infrastructure includes chemical and parasitological laboratories: equipment for drying and wet mineralization of biological samples, microscopes (stereoscopic and fluorescent), an *in vitro* culture system, a microplate reader for evaluation and interpretation of immunological tests.

CDB&MP has been involved in numerous national projects. The group collaborates with Polish national parks as well as with universities in Poland and Europe.

The expertise offered includes:

- evaluating body burden of heavy metals (mercury, lead, cadmium, copper and fluoride) in warm-blooded native and alien wild animals (including animals occurring in Natura 2000 areas of NW Poland);
- investigating trace elements in human tissues, particularly bones;
- detecting and identifying parasites in patients, including low immunity ones;
- identifying pathogenic and opportunistic parasites in environmental samples;
- tracing effects of selected substances on ion transport in the digestive tract of laboratory animals experimentally infected with various parasites;
- identifying the role of arthropods as bloodsucking vectors of diseases, including the Lyme disease.

The group seeks cooperation in identifying chemical and biological environmental risk factors for humans, wild birds and mammals, in employing animal bioindicators in environmental pollution assessment and in investigating physiological and biochemical aspects of ion transport in parasite-host system.

Keywords describing the expertise offered:

ecotoxicology, toxicology, trace elements, human parasites, parasite-host system, ion transport

Health

Pomeranian Medical University, Szczecin
ul. Broniewskiego 26
71-460 Szczecin
Poland
www.pum.edu.pl

Jolanta Kucharska-Mazur, M.D.

Department of Psychiatry
e-mail: cpmpum@pum.edu.pl
phone: +48 91 454 15 07

The Department of Psychiatry (DP) is a scientific and clinical unit with a group of specialists in psychiatry, psychology, psychotherapy, genetics and biochemistry whose research focuses primarily on:

- stem cells, factors involved in their trafficking in acute psychiatric disorders and gene expression;
- pharmacogenetic evaluations of the use of old and new psychotropic medications, with assessment of their therapeutic efficacy, side effects (treatment safety) and costs;
- genetic and psychometric studies on alcohol-addicted patients and their families;
- genetic and psychometric studies on patients with personality disorders, depression, schizophrenia and anxiety disorders, and on healthy populations;
- pharmacotherapy rationalisation in endogenous depression and paranoid schizophrenia, based on genetic and pharmacokinetic conditions;
- new antidepressants, neuroleptics and medications against "alcohol craving" in clinical trials;
- dietary effects on psychosis, Alzheimer onset the disease development.

At present, the DP specialists work on:

- mobilisation of stem cells in patients with schizophrenia and ultra-high risk of schizophrenia, in anxiety disorders and in healthy volunteers;
- clinical evaluation of new psychotropic drugs;
- investigations on dopaminergic, serotonergic, gabaergic, glutaminergic, and cannabinergic neurotransmission in alcohol dependence, anxiety, personality, and eating disorders, and in schizophrenia;
- investigations on rehabilitation of cognitive functions in neurological diseases and psychoses;
- side effects of long-term neuroleptic therapy;
- neurocognitive and psychiatric effects of HCV infection and interferon therapy;
- sexual dysfunctions.

The techniques used in the research include:

- collection of standardized health histories of patients and their families;
- RehaCom;
- RT-PCR (Real-Time Polimerase Chain Reaction);
- psychological and psychiatric questionnaires and inventories, e.g. MMPI, Cattel, Wisconsin Card Sorting Test and other neuropsychological tests, TCI (Cloninger's Temperament and Character Inventory), MINI, SCID, MADRS, HAM-A, HAM-D;
- radioimmunological determination of hormone levels in blood serum;
- biochemical assays;
- flow cytometry.

The DP research infrastructure includes laboratories outfitted with, i.a. real time PCR, Rehacom, flow cytometer, HPLC and ELISA equipment.

The expertise offered includes:

- recruitment of patients with psychiatric disorders for stem cell mobilization studies;
- conducting genetic analysis in medicine;
- testing new methods of psycho- and pharmacotherapy;
- complex studies on stem cells and factors involved in their trafficking in psychiatric disorders;
- recruitment of patients and their families for epidemiological, genetic, neurocognitive, pharmacological and neurophysiological studies;
- detailed psychological, psychiatric and biochemical characterisation of patients.

Health

Keywords specifying the offered expertise:
genetics, neurotransmission, stem cells, neurorehabilitation, pharmacotherapy, RT-PCR, clinical study, cytometry, ELISA, HPLC, schizophrenia, anxiety disorder, SUD, depression, bipolar disorder

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology, Szczecin
ul. Papieża Pawła VI/3
71-459 Szczecin
Poland
www.wnozir.zut.edu.pl

Professor Elżbieta Kucharska, D.M., D.Sc.
Professor Teresa Seidler, Ph.D., D.Sc., Eng.

Faculty of Food Sciences and Fisheries
Department of Human Nutrition
e-mail: elzbieta.kucharska@zut.edu.pl
e-mail: teresa.seidler@zut.edu.pl
phone: +48 91 449 65 15

Department of Human Nutrition consists of a team of young researchers and experienced scientists involved in research on and selecting of nutrition systems aimed at developing optimal diets for healthy individuals and addressing particular needs of ill or nutrient-deficient individuals.

The group carries out research focused primarily on:

- assessing immunological responses resulting from consumption of different foods;
- examining effects of various foods on pathological processes to develop functional diets that address various individual needs (including dietary correction of biochemical imbalances);
- investigating vitamin deficiencies and developing deficit-balancing schemes in different social groups, with a particular emphasis on performance athletes to address specific individual and discipline needs;
- developing recommendations on dietary patterns for different social groups, with a particular reference to modification of nutrition recommendations associated with civilizational diseases.

The group collaborates closely with other university departments and universities (e.g. the Pomeranian Medical University) to determine levels of antioxidant enzymes, basic parameters as well as levels of carotenoids and free radicals in body fluids.

Based on the assessment of a menu content and its nutritional value, the group redesigns diets for healthy and ill individuals as well as explores possibilities of extending remission periods through diet modification or to slow down the cachexia progress in the chronically ill. The group tests, using animal models (mice), immunomodulation effects caused by various chemicals, food products, and pro-biotic bacteria in nutritional allergies, using flow cytofluorometer (FACS) to determine immunological response. The group's research infrastructure includes laboratories outfitted with equipment necessary in assays of antigens, antibodies, cytokines, adhesion molecules, chemokines, dissolvable receptors (immunoenzyme method), high pressure high performance liquid chromatography (HPLC; to be used in, e.g. determining vitamin levels in human body).

The expertise offered includes:

- determining effects and deficiencies of 28 nutritional components (main nutrients, bio-elements, water and lipid dissolvable vitamins) based on menus and meal portion sizes;
- identifying effects of immunostimulation and immunosupression caused by nutrition components and probiotics;
- conducting studies on nutritional allergies.

The group seeks collaboration in assessing patients' physical condition and illness status, current state of nutrition, in developing treatment methods, and in determining individual energy requirements associated with individual sport disciplines.

Keywords describing the expertise offered:
human nutrition, diet, immunomodulation, vitamins, nutritional allergies

Health

Pomeranian Medical University, Szczecin
al. Powstańców Wielkopolskich 72
70-11 Szczecin
Poland
www.pum.edu.pl

Professor Anna Machalińska, M.D., Ph.D., D.Sc.

Faculty of Medicine
Department of General Pathology
Centre for Research and Development of Innovative Therapies in Ophthalmology
e-mail: annam@pum.edu.pl
phone: +48 91 466 15 46

The Centre for Research and Development of Innovative Therapies in Ophthalmology (CeRDITO) groups specialists working primarily on:

- prevention, diagnosis and innovative treatment of common neurodegenerative eye diseases associated with age and environmental factors age-related macular degeneration (AMD), retinopathy of prematurity (ROP), diabetic and hypertensive retinopathy, ischemic ocular neuropathy;
- development of innovative therapeutics, including cellular and gene-based therapies for ophthalmic diseases (innovative cell-based formulations and packaging systems for controlled and site-specific delivery of pro-regenerative drugs for ophthalmic diseases);
- investigation of novel biomarkers for disease diagnostics and therapy monitoring (search for biologically active substances and gene-related products for diagnostic applications in ophthalmology);
- development of multi-centre pre-clinical and clinical studies of innovative therapies for different applications in ophthalmology (microencapsulation of therapeutic substances, ophthalmic delivery of controlled release drugs, biotechnology of therapeutic nanogels and dendrimers for ophthalmic diseases).

Additionally, the CeRDITO specialists pursue research on characterization of biodegradable nanomaterials and innovative nanotechnologies for different therapeutic and diagnostic applications in ophthalmology.

The CeRDITO research infrastructural capacity includes microscopy (fluorescence/confocal) facility, a multi-imager system for analysis of fixed and live biological samples (Pathway, BD), a Luminex-FlexMap3D bead array system, flow cytometry (LSRII, BD) and cell sorting facility (FacsAria-IIu, BD), a cell-culture facility for human primary cell cultures, real-time qPCR system and a microarray facility, a laboratory animal facility, a multimodal in vivo imaging system using bioluminescence/fluorescence/X-ray/ionizing radiation for preclinical studies (In-Vivo Xtreme), vision research facility including electroretinography (UTAS), a retinal vessel analyzer (Imedos), and retinal spectral-domain optical coherence tomography (Bioptigen).

The expertise offered includes:

- morphological and functional characterization of different retinal degeneration models;
- pre-clinical in vivo models for various ophthalmic diseases related to retina (retinal acute chemical injury, inherited slow retinal degeneration, retinal pigment epithelium (RPE) injury model);
- "packaging" of neuro-active substances on micro scale and characterization of their therapeutic effectiveness ("combined cell- and gene-based therapies");
- multiple-target biochemical or immunological diagnostic tests (ELISA, Luminex, Flow cytometry, protein arrays) for biomarker identification in clinical samples;
- search for differentially expressed genes and miRNAs as potential diagnostic or prognostic molecular biomarkers in personalised medicine of retinal degenerations;
- investigating pathophysiology of ophthalmic diseases through multimodal morphological, cytogenetic and molecular biology services;
- functional characterization of retinal degeneration in animal models, based on optical coherence tomography and biological responses to visual stimuli tested by electroretinography or retinal vessel responsiveness analysis;
- stem cell isolation for combined cell- and gene-based therapeutic strategies;
- animal models of different retinal degenerative diseases.

Keywords describing the expertise offered:

ophthalmology, retinal degenerative diseases, cell-based therapy, gene-based therapy, functional diagnostic tests of retina, biomarker identification, nanomaterials, nanotechnologies

University of Szczecin
ul. Wąska 13
71-415 Szczecin
Poland
www.univ.szczecin.pl

Professor Beata Tokarz-Deptuła, Ph.D., D.Sc.

Department of Immunology
e-mail: kurp13@univ.szczecin.pl
phone: +48 91 444 16 05

The Department of Immunology (DI) is involved in research on:

- natural and acquired immunity (as determined using parameters of nonspecific and specific, cell and humoral immunity) in infections, particularly those caused by viruses and Chlamydia; the parameters determined collectively create an immunological profile of mammalian subjects (animals, humans), pivotal for the assessment of their immunological status; high quality equipment and a special vivarium makes it possible for DI to conduct environmentally safe experiments; the research employs classical techniques used in immunology (flow cytometry, mass spectrometry) and virology (real-time PCR) as well as numerous other molecular techniques to assess, e.g. expression of genes encoding different immunological substances, i.a. cytokines, interleukins and chemokines; serological tests (ELISA) are carried out as well;
- diagnostics of influenza virus based on multiplex real-time PCR and research based on molecular biology methods, bioinformatics, virusological and immunological methods, leading to technological production of anti-influenza vaccines (in collaboration with National Institute of Public Health, National Influenza Center in Warsaw);
- research on protein fractions constituting part of replication in DNA bacteriophage lambda and research on the role of SeqA protein in transcription regulation from bacteriophage's lambda promoters (in collaboration with Department of Molecular Biology, University of Gdańsk);
- stem cell research, including the impact of hormones in populations of very small embryonic like stem cells (VSELs).

The expertise offered includes:

- conducting research on problems related to natural and acquired immunity (as determined with parameters of nonspecific and specific, cell and humoral immunity) in viral infections;

Collaboration is sought to carry out joint projects focused on problems pertaining to natural and acquired immunity in viral infections.

Keywords describing the expertise offered:
immunology, natural and acquired immunity, viral infections, bacteriophages

Health

Pomeranian Medical University, Szczecin
al. Powstańców Wielkopolskich 72
70-111 Szczecin
Poland
www.pum.edu.pl

Iwona Wojciechowska-Koszko, M.D.

Department of Microbiology and Immunology
e-mail: IwonaKoszko@interia.pl
phone: +48 91 466 16 65
mobile: +48 660 681 220

Department of Microbiology and Immunology (DMI) is a multidisciplinary centre active in clinical immunology, microbiology and transplantology. The DMI experience is based on effective collaboration of skilled laboratory specialists, clinically relevant immunologists and clinical transplantologists.

The DMI research is focused on:

- kidney allograft donor/recipient matching;
- bone marrow donor/recipient matching;
- monitoring of alloimmunisation level in kidney allograft recipients (anti HLA antibodies);
- molecular diagnostics of viral infections, BK and CMV in kidney allograft recipients;
- molecular investigations of nosocomial epidemics;
- immunological diagnostics of autoimmune and infectious diseases.

In collaboration with the Clinic of Nephrology, Transplantology and Internal Diseases (CNTID), DMI is currently starting a project on Immunological factors influencing long-term kidney allograft function aimed at identifying mechanisms involved in chronic allograft injury and allograft fibrosis despite immunosuppressive therapy.

The project concentrates on:

- the role of NK cells in the context of killing inhibitory receptor polymorphisms and locus C compatibility;
- the role of anti-HLA antibodies in chronic kidney allograft injury;
- the role of inflammatory reactions IL1, IL6 and IL 17 in the context of chronic kidney allograft injury and recurrent urinary tract infections;
- the role of IL 33 in kidney allograft fibrosis;
- all the above aspects in the context of BK and CMV infections.

DMI collaborates with the Department of Pathology (DP) on flow cytometry applications.

The expertise offered includes:

- molecular procedures related to HLA antigen examination (PCR-SSP);
- molecular parameters of BK and CMV infection monitoring (Real-Time PCR);
- Luminex technology and its application in alloimmunisation monitoring;
- different immunoassays: immunofluorescence and ELISA;
- bacterial strains genotyping methods (PFGE, RAPD);
- clinical background and translational approach resulting from collaboration with CNTID.

Keywords describing the expertise offered:

chronic kidney allograft injury, interleukins, alloimmunisation, CMV and BK viral infections, NK cells, fibrosis, HLA typing

Koszalin University of Technology
ul. Śniadeckich 2
75-453 Koszalin
Poland
www.wilsig.tu.koszalin.pl/ktsib/

Paweł Zarzycki, Ph.D., D.Sc., Associate Professor

Department of Environmental Technologies and Bioanalytics
e-mail: pkzarz@wp.pl
phone: +48 94 347 86 71
mobile: +48 507 516 486

Department of Environmental Technologies and Bioanalytics (DETB) conducts research in biomedical, environmental and pharmaceutical sciences. The group is particularly interested in developing new and non-expensive separation technologies that can be applied in quantification of endocrine disrupting compounds (EDCs), biomarkers, bioactive substances and related compounds in complex biological and environmental samples. Currently, the DETB team is working on measurement and characterization of antioxidant properties of food products and steroids biodegradation in surface water ecosystems and during sewage water treatment technological processes. In addition, they are develop new micro-chamber units and adapting micro-TLC systems for Microfluidic Paper-Based Analytical Devices (μPADs) and Micro Total Analysis Systems (μTAS) as well as hybrid planar electroseparation units for separation and quantification of bioanalytes and micropollutant from complex samples. In addition to the separation science, the DETB team is involved in extensive research related to hyperbaric medicine, underwater technology, and low-molecular mass fingerprinting of surface water ecosystems.

Additionally, research carried out at DETB addresses Spirulina-containing foods and isolation and determination of fullerenes, steroids, and macrocyclic compounds such as cyclodextrins, calixarenes and macrocyclic antibiotics. Recently, the DETB team has been working on new sensitive detection systems applied to planar electroseparation techniques involving quantum dots fluorophores and quantification of biomarkers via paper-based microfluidic devices. The DETB research infrastructure includes a pre-treatment vacuum centrifuge, SPE vacuum manifolds, pH and oxygen meters, analytical balances, an optical microscope with digital camera, HPLC chromatographs operating with DAD UV-Vis detector, originally developed micro-thin-layer chromatographic chambers working under temperature controlled conditions (micro-TLC), ASA quantification systems and equipment enabling samples collection from water ecosystems (lakes and the Baltic Sea).

The expertise offered includes:

- high-efficiency methods for removal of organic contaminants from water and sewage, particular attention being paid to methods of advanced oxidation;
- municipal wastewater treatment in biological processes, sludge management and pretreatment of sludge liquid from anaerobic sludge digestion;
- backwash and regeneration of filter beds used in water treatment technology;
- research in the SBR system and analysis of physicochemical parameters of sewage and activated sludge;
- application of temperature-dependent inclusion chromatography, temperature-controlled micro-planar chromatography and multivariate statistics for separation and quantification of steroids and related endocrine disrupting compounds in water samples;
- investigating thermochromic effect involving host-guest interactions between dyes and macrocyclic compounds and its potential use for quantitative detection of UV-transparent compounds in micro-TLC, HPLC and CE techniques as well as HPTLC based microfluidic devices;
- application of DETB new analytical protocols for fast fingerprinting and quantification of a wide range of low-molecular mass compounds from complex samples, including Spirulina cells, pharmaceutical formulations, sewage water, fish bile, tissue extracts, blood or urine.

DETB seeks cooperation in:

- various problems related to wastewater technological processes;
- analysis of steroids and related endocrine disrupting compounds in complex biological and environmental samples;
- pharmaceutical and biomedical analysis including drugs bioavailability and pharmacokinetics driven by multivariate data proceeding;
- theory and thermodynamics of separation processes;
- supramolecular chemistry, particularly thermochromic effects of inclusion complexes and LC separations involving host-guest complexation at different temperatures;
- miniaturisation of high-throughput separation and detection systems based on liquid mobile phases, including thin-layer chromatography, high-performance liquid chromatography, capillary electrophoresis and microchip electrophoresis;
- ecotoxicology focused on endocrine disrupting compounds;
- metabolomic study of biological and environmental systems involving new and high-throughput separation science protocols driven by multivariate statistics.

Keywords describing the expertise offered:
wastewater, activated sludge, advanced oxidation, ecotoxicology, separation science, liquid chromatography, quantitative analysis, macrocyclic antibiotics, low-molecular mass compounds, supramolecular chemistry, pharmaceutical formulations, micro-thin-layer chromatography, temperature-dependent inclusion chromatography, antioxidants, steroids, cyclodextrins, fullerenes, quantum dots

Health

DOM LEKARSKI S.A.
ul. Bagienna 6
70-772 Szczecin
Poland
www.domlekarski.pl

Dr Wojciech Chlewicki, Eng.
Department of Research and Development
e-mail: wchlewicki@domlekarski.pl
phone: +48 91 460 14 08
mobile: +48 534 368 023

Dom Lekarski medical centre was established in Szczecin (Poland) in 2001. We specialize in orthopaedics, ophthalmology, hand surgery, ENT surgery, laryngology, phlebology and others. We work with the best medical specialists in our region.
Dom Lekarski is an innovative company so we are focused on inclusion of the most modern procedures and medical equipment in our practices. Recently we have implemented:

- pioneering solutions for laser eye treatment (EBK) involving new painless procedures for patients who prefer not to wear prescription glasses and contact lenses;
- cruciate ligament reconstruction (ACL) and meniscal transplantation at one procedure which speeds up patient's recovery and improves the final results of treatment;
- Xiapex (Am. Xiaflex) – a new non-surgical treatment for Dupuytren's disease; there are no incisions, no stitches and no scars; the treatment has the advantage of providing a quick recovery;
- celon snoring treatment: the minimally invasive method to treat obstructive sleep apnoea or snoring.

The company has implemented ISO 9001:2008 Quality Management System. Dom Lekarski is a member of HOPE the European Hospital and Healthcare Federation. We hold a certificate of the Polish Association of Medical Tourism.
R&D department of Dom Lekarski collaborates closely with the West Pomeranian University of Technology in Szczecin, mainly in the field of telemedicine and prototyping. Research work of the department resulted in two patent applications related to telerehabilitation. Other applications are on the way.

Offered expertise:

- Dom Lekarski is a network of medical centres which offer comprehensive healthcare services in Poland, Sweden and the UK;
- work of the R&D department focuses on telemedicine applications;
- we are working on expanding medical tourism.

Keywords specifying the offered expertise:
orthopaedics, ophthalmology, surgery, laryngology, phlebology, telemedicine, medical tourism

MS REHABILITATION CENTER
ul. Szpitalna 5
78-449 Borne Sulimowo
Poland
www.centrumsm.eu

Mariusz Kowalewski
Head of MS Rehabilitation Center
e-mail: m.kowalewski@centrumsm.eu
phone: +48 94 373 38 05
mobile: +48 602 151 488

We are interested in participating in various projects concerning research on multiple sclerosis rehabilitation.

We are a rehabilitation center for MS patients. We accept 50 patients for rehabilitation every month. Annually, we serve about 600 patients. This provides a unique access to a large group of patients with the same disease. About 80 per cent of our patients come to our center once a year. We conduct comprehensive neurorehabilitation and work as an interdisciplinary team.

We provide:

- kinesitherapy;
- physiotherapy;
- hydrotherapy;
- cryothetapy;
- occupational therapy;
- psychotherapy;
- neuropsychotherapy;
- music therapy;
- sociotherapy;
- speech and swallowing therapy.

In addition, we have an opportunity to perform functional MRI in a nearby hospital. By working only with persons suffering from MS, our personnel – therapists, nurses, caregivers and doctors – have gained ample expertise and are experts in their individual fields. We offer multidisciplinary rehabilitation and are able to measure its effectiveness. We have over 10 years of experience. Our centre is a part of RIMS (Rehabilitation in Multiple Sclerosis – an organization bringing together similar rehabilitation centres in Europe). We have taken part in international research in the form of a survey serving the purpose of developing a European database of MS patients (The European Register for Multiple Sclerosis). We plan to establish an e-Institute – a platform of cooperation for a group of MS rehabilitation centres in Europe. It will be a modern and complex computer-aided scientific and educational centre. It will use telerehabilitation, e-education, and scientific e-research. It will involve development of a database to collect information from MS patients on their ways for MS management.

Proposed contribution to the project:

The centre offers access to a group of MS patients and their medical data and its personnel's expertise and experience in MS treatment and rehabilitation. We are interested in developing new rehabilitation methods, testing new devices and improving patients' quality of life. Moreover, we would like to expand our support to the patients by supplying them with rehabilitation and educational assistance not only in our centre, but also at their homes. One of the ways of doing it is telerahabilitation and e-education which are in the focus of our interest at the moment. Our centre can be in charge of research activities such as assessment and validation of devices, treatments, care protocols, etc. as well as training activities.

Keywords specifying the offered expertise:

MS, multiple sclerosis, rehabilitation, research, kinesitherapy, physiotherapy, hydrotherapy, cryothetapy, occupational therapy, psychotherapy, neuropsychotherapy, music therapy, sociotherapy, sclerosis multiplex, SM, EEG, EMG biofeedback

Health

Pomeranian Medical University, Szczecin
ul. Rybacka 1
70-204 Szczecin
Poland
www.pum.edu.pl

Professor Artur Mierzecki, M.D., Ph.D.

Karolina Kłoda, M.D., Ph.D.

Independent Laboratory of Family Physician Education
e-mail: wikarla@gazeta.pl
phone: +48 91 480 08 71

The Independent Laboratory of Family Physician Education has experience in EU-funded projects resulting in skills and competences related to:

- prevention;
- addiction;
- public health;
- primary health care.

Fields of expertise:

The Laboratory was involved in several European projects, resulting in gaining valuable experience in terms of implementation of preventive activities in primary health care (TEMPUS), dissemination of brief interventions in alcohol problems and increasing activity of health care professionals (PHEPA), health professionals and smoking cessation (HP2), genomics to combat resistance against antibiotics (GRACE), and optimizing delivery of health care interventions (ODHIN).

Research infrastructure:

The Laboratory has strong links to local primary care providers as it is responsible for training and supervising family medicine residents originating from the West Pomeranian Province. In addition, the Laboratory plays an active role in raising awareness regarding alcohol consumption and tobacco smoking, providing brief interventions via training, educational and research activities. Importantly, the Laboratory has also experience in collaborating with local small and medium-sized enterprises, health system institutions and policy makers, gained during other EU-funded projects and local cooperation aimed at preventive tasks within primary care. Finally, the Laboratory collaborates closely with the European Network for Prevention and Health Promotion in Family Medicine and General Practice (EUROPREV).

Offered expertise:

- prevention in primary health care, including alcohol screening and brief intervention as well as smoking cessation;
- various aspects of public health: analysis of health threats, health promotion, disease prevention, statistics etc.;
- family physician/general practitioner education, including development of specific packages of training & support, carrying out courses, delivering feedback;
- scientific cooperation with family physicians/general practitioners, nurses and other medical professionals, including specialists;
- scientific cooperation with small and medium-sized enterprises related to healthcare;
- implementation of scientific results into primary health care.

Keywords specifying the offered expertise:

addiction, alcohol, family physician, general practitioner, prevention, primary health care, public health

Pomeranian Medical University, Szczecin
ul. Powstańców Wielkopolskich 72
70-123 Szczecin
Poland
www.pum.edu.pl/wydzialy/wydzial-lekarski/katedra-i-zaklad-mikrobiologii-immunologii

Bartosz Wojciuk M.D., Ph.D.

Department of Microbiology and Immunological Diagnostics
e-mail: wojciukb@gmail.com
phone: +48 91 466 16 52
mobile: +48 609 666 028

Department of Microbiology and Immunological Diagnostics (DMID) is a research unit of Pomeranian Medical University, placed within the structure of Public Clinical Hospital No. 2 in Szczecin. DMID provides comprehensive microbiological and immunological diagnostics for the university clinics, including transplantation immunology.

DMID employs a team of laboratory specialists as well as clinicians skilled in clinical microbiology, clinical immunology, internal medicine and clinical transplantation. The multidisciplinary character of the team has underlies successful, long-lasting collaboration with nephrologists and clinical transplantologists from the Clinic of Nephrology, Transplantation and Internal Medicine.

The major scientific interests of the Department address, in general, immune mechanisms of chronic kidney allograft injury. The problems of interest are listed below:

- the role of humoral response mechanisms and donor specific antibodies (DSA) in chronic kidney allograft rejection;
- the role of chronic inflammation and IL17/IL23 axis in chronic kidney allograft rejection;
- the impact of natural killer cells (NK) on kidney allograft immunity;
- the influence of viral infections (CMV and BKV) and urinary tract infections on long-term kidney allograft function.

DMID has expertise in:

- HLA assessment based on molecular methods;
- monitoring of kidney recipients' pre- and post-transplant immune status;
- implementation of multiplex technology into immunological diagnostics and research;
- translational approach towards immunological research;
- molecular studies on nosocomial infections.

The teaching activities of DMID provide a strong theoretical background, common for laboratory specialists as well as clinicians involved in the team. The DMID laboratories are equipped in luminex based analyzer (LabScan 100), PCR SSP and real time PCR and the relevant set of equipment (preparation chambers, termocyclers), enzyme linked immunoassays (ELISA) equipment.

Offered expertise:

- donor-specific antibodies (DSA) level post-transplant monitoring based on luminex technology (labscreen tests and single antigens specific tests performance and interpretration);
- conducting and interpretation of PCR SSP analyses;
- ELISA calibration and interpretation;
- ELISA- based fluid cytokine level determination;
- conducting lymphocytotoxic tests and their interpretation, lymphocytes isolation, storage and incubation procedures;
- cytomegalovirus and BK viremia assessment with real time PCR;
- pulse-field gel electrophoresis performance and interpretation.

Keywords specifying the offered expertise:

clinical immunology, kidney transplant immunity, cytokines, inflammation, infection, DSA

Health

4

Information & Communication Technologies

West Pomeranian University of Technology, Szczecin
ul. Żołnierska 49
71-210 Szczecin
Poland
www.kmsiims.wi.zut.edu.pl

Marcin Pluciński, Ph.D.

Faculty of Computer Science and Information Technology
Department of Methods of Artificial Intelligence and Applied Mathematics
e-mail: mplucinski@wi.zut.edu.pl
phone: +48 91 449 55 09

Department of Methods of Artificial Intelligence and Applied Mathematics (DMAIAM) is an interdisciplinary group of specialists working within the Faculty of Computer Science. DMAIAM's research activities are mainly focused on the following topics:

- data analysis and application of classifiers and regression models based on data (technical, economic, medical) - using standard methods and methods of artificial intelligence;
- solving optimization tasks - using classical methods and methods of artificial intelligence;
- development of mathematical models of dynamic plants and technical and economic processes;
- development and testing of a variety, including classical and modern (fuzzy, neuro-fuzzy), control algorithms of technical objects;
- development of learning and control algorithms for a mobile robot or a group of robots;

Additionally, the following research's activities are in the spectrum of DMAIAM's interests:

- application of the reinforcement learning of a behaviour policy for mobile robots;
- decision making under uncertainty and risk, processing uncertain information;
- local regression models and their application for uncertain and incomplete data;
- machine learning and data mining (data analysis, classification and regression algorithms, theoretical background on machine learning techniques, application to medical and industrial problems);
- probabilistic Inference (probabilistic modeling (Bayesian networks, HMMs). Probabilistic computation (statistical computation, distribution of statistics, propagation of uncertainty, system reliability, probabilistic arithmetic, etc.);
- artificial Intelligence (Graph searching algorithms and related discrete optimization problems);
- rapid prototyping and testing of control algorithms using programmable controllers.

DMAIAM has expertise in:

A software design and implementation for a specific task, an method assessment on a model and a development of technical documentations and reports, related to data analysis and application of classifiers and regression models, optimization methods, development of mathematical models, development and testing of control algorithms. DMAIAM is involved in some international and national projects, has experience at the development a software design and implementation mainly for a data analysis and control. DMAIAM cooperates with scientific partners from different sectors – including medicine, control, maritime technology etc. and with industrial partners.

Offered expertise:

- technical, economic, medical data analysis based on classical methods and methods of artificial intelligence;
- solving optimization tasks;
- development of mathematical models of dynamic plants and technical and economic processes;
- development and testing of a variety, including classical and modern (fuzzy, neuro-fuzzy), control algorithms of technical plants;
- development of tuning and supervisory algorithms dedicated to control algorithms;
- development of learning and control algorithms for a mobile robot or a group of robots;
- application of classifiers and regression models based on technical, economic, medical data.

Modern infrastructure: laboratories, equipment: programmable controllers (Bernecker&Rainer (X20s, Power Panels, Automation Panels, etc.), GE, Siemens, National Instruments); software: Wonderware Industrial Software (ActiveFactory, Application Server Device Integration, Historian Client, Historian Server, InBatch etc.).

Keywords specifying the offered expertise (50-200 characters including spaces):

data-mining, artificial intelligence, classification, regression, optimization, mathematical models of dynamic plants, learning and control algorithms

Koszalin University of Technology
ul. Racławicka 15-17
75-620 Koszalin
Poland
www.kmp.wm.tu.koszalin.pl

Dr Maciej Majewski, D.Sc., Eng.

Faculty of Mechanical Engineering
Division of Technical and IT Systems Engineering
e-mail: maciej.majewski@tu.koszalin.pl
phone: +48 94 347 83 52

The Division of Technical and IT Systems Engineering is an interdisciplinary group of specialists in human-machine interaction and applications of artificial intelligence in machine construction and operation. The group's research is primarily focused on:

- building intelligent interaction systems between technical devices and their human operators;
- developing intelligent methods for operator's biometric identification, command meaning analysis, command effect analysis, command safety assessment, and process supervision;
- developing intelligent methods for processing of commands and messages issued by human operator in a natural language;
- building cognitive interfaces for human operators of technical devices;
- building intelligent interactive systems for design of machine elements and assemblies based on features described in a natural language;
- developing means of control, supervision and optimisation of manufacturing processes;
- developing future intelligent interface devices for mobile technologies;
- analysing artificial creativity.

The Division research infrastructure includes well equipped modern laboratories. The group is involved in international and national projects, and has experience in the development of intelligent interactive systems which can be used in industrial applications.

The expertise offered includes:

- building intelligent interfaces between technical devices and their human operators;
- developing artificial intelligence hybrid systems for production processes;
- exploring application of artificial intelligence methods and techniques (neural networks, evolutionary algorithms, fuzzy logic);
- developing methods for natural language and handwriting recognition;
- building intelligent interactive systems of technical devices and their operators, equipped with intelligent mechanisms for operator biometric identification, command meaning analysis, command effect analysis, command safety assessment, and process supervision. The systems are applied in supervision of automated production processes, with the use of mobile technologies and an intelligent assessment system of human operator's ability for efficient processing of information streams from multiple sources;
- developing cognitive interfaces for human operators of technical devices, intelligent interactive systems for design of machine elements and assemblies based on features described in a natural language;
- supervising and optimisation of manufacturing processes;
- developing future intelligent interface devices, artificial creativity, artificial intelligence hybrid systems, artificial intelligence methods and techniques (neural networks, evolutionary algorithms, fuzzy logic), methods for natural language and handwriting recognition.

Keywords describing the expertise offered:

intelligent interaction, speech interface, interaction by speech and natural language, artificial intelligence, hybrid systems, neural networks, manufacturing, production, machine building

West Pomeranian University of Technology, Szczecin
ul. Sikorskiego 37
70-313 Szczecin
Poland
www.kpsiim.zut.edu.pl

Dr Krzysztof Okarma, D.Sc., Eng.

Faculty of Electrical Engineering
Department of Signal Processing and Multimedia Engineering
e-mail: okarma@zut.edu.pl
phone: +48 91 449 43 92; +48 91 449 53 13; +48 91 449 53 11

The Department of Signal Processing and Multimedia Engineering (DSPME) groups academic researchers working on signal and image processing, multimedia, and on selected aspects of applied computer science.

The DSPME research concerns primarily:

- acoustics and signal processing (digital surround systems, audio conversion, vibroacoustic analysis, real-time signal processing using DSP and GPGPU solutions, spectral analysis);
- computer vision, image processing and analysis (image and video quality assessment, image and video compression, 3D scanning, nonlinear filtration of images and signals, extraction of geometrical features from images, texture analysis, computer vision for automation and robotics, vision based control of mobile robots);
- video analysis and motion tracking (augmented reality, virtual studio technologies, motion capture, motion tracking, camera tracking);
- Web and multimedia technologies (computer network traffic analysis, Web and multimedia applications, mobile applications, audio and video streaming, integration of ICT systems, transmission of measurement data).

The DSPME research infrastructure (supported in part by the European Union's Integrated Operational Programme of Regional Development) includes:

- Laboratory of Audio Engineering and Ambiophonics with ICON Control 32 console;
- Accelerator of Multimedia Calculations (a computer cluster with 400 cores);
- Laboratory of Multimedia Engineering;
- Laboratory of Television Technologies (with motion capture system).

The expertise offered includes:

- various applications of applied computer science, especially related to computer vision and image/video analysis;
- potential application areas concern, e.g. vision based control of mobile robots, statistical video analysis and similarity based image analysis such as comparison of textures;
- application of automation and mechatronics systems with vision based monitoring or feedback;
- applications of audio and signal processing algorithms, with a particular reference to surround systems;
- applications of ICT, computer networks, parallel computing, and video analysis, particularly motion tracking.

Keywords describing the expertise offered:

multimedia, image analysis, computer vision, image processing, vibroacoustics, ambiophonics, surround systems, signal processing, computer networks, ICT, motion capture, video tracking, applied computer science

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology, Szczecin
ul. Sikorskiego 37
70-313 Szczecin
Poland
www.we.zut.edu.pl

Dr Krzysztof Pietrusewicz, D.Sc., Eng.

Department of Control Engineering and Robotics
e-mail: krzysztof.pietrusewicz@zut.edu.pl
mobile: +48 663 398 396

The Department of Control Engineering and Robotics (DCER) groups specialists skilled in designing and implementing complex control systems, specifically in:

- modelling and simulation of processes;
- identifying process model parameters;
- synthesis of adaptive and predictive control algorithms in a single- and multivariable control systems in classical and resistant structures;
- control systems design, including model-based design;
- application of the most recent methods and computational techniques to design of monitoring and automatic control, implemented through programmable automation devices and manipulators;
- meta-modelling of complex control systems, automatic code generation, functional safety issues;
- classical and robotic (with DELMIA V5 Automation tools) control systems using distributed DCS/PLC/PAC latest generation automation systems.

The DCER staff's achievements won national recognition in the form of automation branch awards and those granted at the International Fair in Poznań (Poland), including five Gold Medals: for an open CNC machine control system (2009), for a prototype micromilling machine with integrated diagnostic system (2011), in 2012 for implementation of thermal correction in feed-drive module control in a ballscrew driven CNC machine (2012), and for automated visual positioning of workpieces and the prototype five-axis milling centre called X-5 (2013). The DCER research infrastructure includes facilities for hardware-in-the-loop testing of complex systems, possibility of implementing real-time hardware modules for control and condition monitoring tasks, software for component-based acausal modelling and simulation. The expertise offered and cooperation sought concern a variety of measurement technologies used in a machine (internal systems) or with it (external systems) that are able to proactively anticipate the emerging need for servicing or repair. Some machines are poorly designed, some are poorly assembled, and some are poorly utilized, 40-50% of machine failures being due to poor maintenance. Machines break down because operators do not realise the scale of the impact they might have on the state of the machines. Changes in machine operational procedures allow to reduce the damage rate by 40-50%. In the last thirty years, machinery operating has been undergoing an evolution of a kind, from reactive maintenance (RM) to preventive maintenance (PM) to modern predictive maintenance (PdM) systems. The essence of the predictive approach is an attempt to estimate the time of next maintenance activity based on monitoring of equipment condition. The monitoring can be based on available measurement signals in control circuits, or can require additional measurements (e.g. vibrations, force measurements). PdM differs from PM (with fixed maintenance dates), as it has varied length of service intervals.

The expertise offered includes:

- preparation of equipment and systems for industrial process automation, including performance reviews for innovative project proposals submitted to the European Union;
- research and services in design and construction of programmable control systems of technological processes (control algorithms, hardware selection, diagnostics and visualization processes, application of artificial intelligence in automation systems);
- training and courses in the design of distributed control systems of technological processes in PLC/PAC/FPGA programming, digital servo programming, diagnostics and visualization of processes, robot and CNC machine tool programming, and functional safety analysis and design.

We have experience in Framework Programmes as a partner.

Keywords specifying the offered expertise:

dynamic systems modelling, predictive maintenance, condition monitoring, component based acausal modelling, model-based control, meta-modelling, model-based management, risk management, requirement management, functional safety

Information & Communication Technologies

Koszalin University of Technology
ul. Śniadeckich 2
75-453 Koszalin
Poland
www.weii.tu.koszalin.pl

Dr Piotr Ratuszniak, Eng.

Electronics and Computer Science
e-mail: piotr.ratuszniak@tu.koszalin.pl
phone: +48 94 347 86 96
mobile: +48 601 920 353

The group consists of electronics and informatics specialists working on:

- population based optimisation algorithms (e.g. GA, EA, PSO);
- parallel architectures (dedicated processor arrays implemented into FPGA devices);
- parallel programming (e.g. TPL, CUDA, OpenCL);
- digital systems design dedicated to implementation into FPGA devices;
- rational fraction arithmetic (optimisation of arithmetic operation for FPGA implementation);
- custom accelerators design (FPGA);
- database systems.

The available infrastructure includes:

- programming software;
- software and hardware for the design and implementation of digital systems into FPGA devices;
- IP Core for arithmetic units using rational fraction arithmetic;
- GPU accelerators;
- access to supercomputers and compute clusters.

The expertise offered includes:

- strong programming skill (e.g. C,C++, C#, Java, ASP.NET, PHP);
- parallel architecture design;
- optimization algorithms design;
- HDL languages (VHDL, Verilog);
- databases design and optimisation;
- optimisation of algorithms for a variety of problems, in particular genetic and evolutionary algorithms for discrete optimisation;
- development of digital systems design and optimisation, particularly those dedicated to FPGA implementation;
- application of rational fraction arithmetic for FPGA based arithmetic unit optimization;
- parallel programming using several languages and technologies;
- processor array design, particularly those dedicated to linear algebra algorithms;
- strong experience in design and optimisation of databases to be implemented in a variety of management systems;
- parallel applications programming;
- www applications.

Keywords describing the expertise offered:

optimisation algorithms, parallel architecture, processor array, FPGA, rational fraction arithmetic, hardware accelerators, databases design and optimisation, parallel programming, GPU

Maritime University of Szczecin
ul. Wały Chrobrego 1-2
70-500 Szczecin
Poland
www.am.szczecin.pl/en

Professor Zenon Zwierzewicz, Ph.D, D.Sc

Faculty of Marine Engineering
Department of Automation and Robotics
e-mail: z.zwierzewicz@am.szczecin.pl
mobile: +48 501 655 479

Department of Automation and Robotics consists of highly qualified academic staff with experience in cooperation with the industry. The staff has expertise in automation and robotics, particularly in the area of advanced automatic control algorithms for different kind of objects and/or processes.

The proposed control design methods and techniques include:

- nonlinear robust and adaptive control;
- optimal control;
- intelligent systems (neuro and fuzzy techniques);
- observers and state estimation (e.g. Kalman filter).

These techniques can be used to control problems in a wide class of objects or processes (from e.g. electrical engineering to mechanics and robotics).

We are particularly experienced in the design of intelligent automatic ship control systems, e.g. robust and adaptive course-keeping systems and/or trajectory (path) following systems (course and trajectory autopilots). The proposed systems are in fact modern robots able to replace, in an automatic manner, a human operator on the ship's bridge.

Offered expertise:

The design of control algorithms for different classes of systems.

To name just a few:

- automatic control systems for ships (course and trajectory autopilots);
- mobile robotics and autonomous vehicles;
- electric power generation;
- electric motors and actuators;
- power electronics;
- internal combustion engines.

Our expertise refers particularly to the design of control algorithms for intelligent steering a ship where different control tasks (course keeping, trajectory following etc.) are considered.

Keywords specifying the offered expertise:

robust, adaptive, optimal, neuro-fuzzy control; ship control, systems of electrical engineering, mechanics, robotics

Information & Communication Technologies

APPTIMIA Sp. z o.o.
ul. Wojska Polskiego 184c/4
71-256 Szczecin
Poland
www.apptimia.com

Mieszko Mularczyk
CEO
e-mail: mieszko.mularczyk@apptimia.com
mobile: +48 535 550 768

Apptimia provides software R&D services in selected industry segments. With a growing team of 20+ senior engineers, we help leading brands from the US and Western Europe to solve their software R&D problems in a brand-new, lightweight mode and by delivering concrete outcomes in an iterative, agile way. Apptimia focuses on software for Agriculture, Manufacturing, UAS (Unmanned Aerial Systems), IoT and Telecom Management Systems.

Apptimia was founded by Telecom software R&D services veterans, with 15y+ industry experience. We develop all layers of software: embedded, backend/frontend for web applications, mobile devices applications.

Atop of its services business, Apptimia drives its own product development such as Apptisense - a comprehensive solution for agriculture (vineyards, orchards and farmlands) and provides crucial, crop-related parameter monitoring and analysis *(www.apptisense.com)***.**

Based on its experience and expertise Apptimia is willing to:

- develop custom software components for UAS (Unmanned Aerial Systems): autopilot, ground control stations and fleet management systems;
- develop custom software components for IoT, manufacturing and agriculture: embedded software for smart sensors and remote measurements systems, complete cloud-based web application for sensor data aggregation, dashboarding and decision support systems;
- license and integrate our Apptisense™ solution platform used for wireless sensor data collection, aggregation and visualization;
- develop general embedded and web-based software in IoT space.

Keywords specifying the offered expertise:

IoT; smart sensors; AgTech; software; precision agriculture; manufacturing; telecom; fog computing

iLEARN3D

iLEARN3D
ul. Jagiellońska 20-21
70-363 Szczecin
Poland
www.iLearn3D.com

Maged Hegazy
CEO
e-mail: maged@ilearn3d.com
phone: +48 91 449 58 80
mobile: +48 731 881 292

Innovative platform for easy transforming unrelated 2D drawings to 3D designs.

- iLearn3D LLC is an extension of a 5 years-long work in innovation, started in the Silicon Valley, passing by Switzerland and landing in Poland;
- owning a patent in easily transforming unrelated 2D drawings to 3D designs with already successful entry to market with 3 products that passed the Beta phase to being commercialized;
- iLearn3D decided to capitalize on its history to enter the 3D education market that is craving for new curricula which empower k-12 students in the 3D domain and permit them to use the booming 3D printing, for which purpose we created AB3Dacademy;
- AB3Dacademy offers online STEM courses in 3D concept, design and printing;
- AB3Dacademy helps students to understand 2D and 3D concepts in an innovative, full of fun and effective method, by giving them access to all course lessons and activities online;
- many courses will guide students during interactive multi-level quizzes, from basic 2D shapes to 3D shapes, 3D projections, 3D design and 3D printing, etc.;
- the available entry course contains a quiz bank of more than 200 quizzes, divided into 7 lessons, each lesson consisting of 6 levels and each level having 5 questions;
- All Courses are prepared in 5 languages (English, French, Arabic, Polish and Turkish);
- AB3Dacademy is an informal Learning Management environment suitable for schools and self-teaching as well as for training centers;
- in Ab3Dacademy we can keep track and manage all data from students, teachers, parents and schools; as all courses are SCORM-based, we can also track the learning inputs and outputs such as scores and behaviour of learners;
- the site is already functional, but will be continuously developed to add courses and 3D learning contents.

For more information, please visit *www.ab3dacademy.com*

Offered expertise:

- introducing a new approach or „a new alphabet" to 3D design - easy to learn, simple to use, taking designers from the well-known 2D field to the more complex 3D domain;
- providing a platform for 3D education and 3D printing at schools starting from primary schools to college level;
- STEM Online courses for children in different languages;
- cooperating with partners which could help us to reach our audience with an added value.

Keywords specifying the offered expertise:
e-learning, KG, Education, STEM, 3D Printing, school's academy, 3D design

Information & Communication Technologies

TECHNOPARK POMERANIA
ul. Cyfrowa 6
71-441 Szczecin
Poland
www.technopark-pomerania.pl

Katarzyna Witkowska
Business Development Department
e-mail: kwitkowska@spnt.pl
phone: +48 91 852 29 15
mobile: +48 693 533 618

The Technopark Pomerania is based in Szczecin (West Pomeranian Region, Poland). Since 2000, its objective has been to support the development of innovative companies, ICT startups and entrepreneurs in the region. The Technopark provides local entrepreneurs with business incubator and support services (incubation and expansion programs including business mentoring and consulting, PR and marketing, access to information on training and industry specific events, legal and accounting services) for the ICT sector.

The Technopark offers business spaces of over 13,000 sqm for the ICT sector. The modern building structure responds to the needs of creative individuals. The facility provides the largest Data Centre in the region. The Technopark provides also virtual office services (Technopark's trustworthy address can be used to increase the business' potential. The coworking zone in the Technopark Pomerania has been designed and equipped to support freelancers and teams in their everyday work. It is also a conference centre as the Technopark provides a range of conference and meeting venues (from 20 to 200 sqm) for tenants and external clients. The rooms available provide an excellent meeting environment for groups of 10 up to 250 people and come complete with the equipment and capacity for work sessions, training, presentations, seminars, conferences, business talks etc.

Offered expertise:

- the 4100 m^2 Business Incubation Centre aimed at fostering and supporting young businesses. The Centre is located in one of new buildings and in a renovated school building. The Centre is a meeting place for exchange of experience and networking that will result in new discoveries in the future; in addition to the office space, the Centre features conference and multimedia halls, and a full range of accompanying amenities;
- the about 5,000 m^2 Innovation Centre of a high technical standard serves companies active in the field of high technologies. The space has been created for the purpose of serving companies specialising in e-commerce, outsourcing, banking, telecommuting, telemedicine, e-learning, help desk, software, IT networks, rental of computer programs via the Internet (ASP) and other broad-services;
- the 1700 m^2 Computer Centre is partly intended as a technical facility only, which houses the server room with equipment necessary for the needs of companies operating in the Park, public administration and other businesses. The building with its infrastructure provides hosting services, mass data processing, IT infrastructure virtualization and information archiving.

At present, the Technopark offers two programmes for entrepreneurs:

incubation and expansion. The first is addressed to companies entering the market, which operate under the supervision of a business consultant. Together they are working on sales strategy, marketing, management, and other things depending on needs. Larger enterprises are involved in the expansion program, which also offers consulting support. Technopark contact other companies looking for suppliers. It supports them with staff recruitment, building the image and seeking capital.

Keywords specifying the offered expertise:

startups, business incubation, training, data centre, business networking, acceleration

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology, Szczecin
ul. Żołnierska 52
71-210 Szczecin
Poland
www.kakit.wi.zut.edu.pl

Professor Aleksandr Cariow

Faculty of Computer Science and Information Technology
Department of Computer Architectures and Teleinformatics
e-mail: acariow@wi.zut.edu.pl
phone: +48 91 449 56 67

Department of Computer Architectures and Teleinformatics (DCAT) is an interdisciplinary group of specialists working within the Faculty of Computer Science and Information Technology. DCAT's research activities are mainly focused on the following topics:

- development of speaker identification and verification systems using typical and dedicated auditory representations and machine learning techniques. The systems may be tuned to work in adverse acoustical conditions.;
- audio surveillance algorithms design, especially for robust audio event detection and auditory scene decomposition into audio objects;
- development of a wide range of improved algorithms for discrete transforms (Fourier, Walsh, Slant, Hartley, wavelet etc.);
- development of new numerical algorithms for real-, complex- and hypercomplex-valued data processing;
- improvement of algorithms and hardware implementation of the most popular digital signal and image processing macro operations;
- structural synthesis of VLSI-oriented processing units for conducting basic digital signal processing operations;
- implementation of digital signal and image processing algorithms both in FPGA and on the basis of other modern VLSI platforms.

Additionally, the spectrum of DCAT interests extends onto the following research activities:

- implementation of algorithms in reconfigurable devices;
- embedded system design and programming;
- design and implementation of fast data compression methods for audio and video applications;
- rapid prototyping and testing of DSP algorithms using programmable controllers and FPGA platforms.

We also offer a unique methodology for synthesizing efficient algorithms for computing vector-matrix products. This technique allows us to design new fast algorithms for various digital signals and image processing applications.

DCAT has expertise in:

- software design and implementation for a specific task, a model-based method assessment and development of technical documentations and reports related to signal analysis, development of mathematical models and testing of digital signal processing algorithms;
- DCAT is involved in international and national projects, has experience in development of software design and implementation, mainly for signal analysis and processing. DCAT has direct design experience in a wide variety of products such as embedded systems, image processing and machine vision, robotics, communications, data acquisition, motion control systems, digital audio, and other applications. DCAT cooperates with scientific partners from different areas, including medicine, control, maritime technology etc.;
- our team of engineers has vast experience in advanced signal processing and embedded systems. We specialize in several areas of design and have the tools required to work with new and proven technologies. Many of our engineers are experienced in several areas of technology. We are committed to continuous training and technical self-development and we are always up to date with new technologies.

Offered expertise:

- DCAT offers a broad portfolio of integrated technologies for diverse voice, audio, data and multimedia applications;
- most of our expertise is applicable to FPGA design and to the design of printed circuit boards embedding FPGA, providing turnkey design services for our clients that can include mixed signal and software design services;
- we specialize in embedded DSP systems (hardware, firmware, software) which utilize embedded processors or microcontrollers. We offer complete turnkey solutions right from concept design & prototyping;
- our embedded system design services include implementation on the basis of FPGA, SoC and microprocessor platforms, such as Spartan-6, Zynq-7000, STM32, NXP LPC, Raspberry Pi, PIC32, Arduino and others;
- DCAT also provides services for designing printed circuit boards and electronics;
- modern infrastructure: laboratories, equipment: LPKF Circuit Board Plotter, National Instruments PXI, Compact RIO controllers.

Keywords specifying the offered expertise:

digital signal and image processing techniques, fast numerical algorithms, VLSI, FPGA devices, embedded system design, PCB, speaker identification and verification, audio surveillance, machine listening, data compression, rapid prototyping

Information & Communication Technologies

West Pomeranian University of Technology, Szczecin
ul. Żołnierska 52
71-210 Szczecin
Poland
www.ksm.wi.zut.edu.pl

Paweł Forczmański, Ph.D., D.Sc.

Faculty of Computer Science and Information Technology
Chair of Multimedia Systems
e-mail: pforczmanski@wi.zut.edu.pl
phone: +48 91 449 55 46

Chair of Multimedia Systems consists of two independent groups of scientists: Research Group of Medical Informatics and Research Group of Computer Graphics and Multimedia. Research activities of both groups are mainly focused on the following topics:

- biometric Identification based on facial portraits taken in visible and thermal spectra; identification of fingerprints as well as images of ears and orthopantomograms (with pre-mortem and post-mortem identification being considered);
- machine Vision applied to intelligent visual surveillance, human action detection in video streams, intelligent transportation systems and human-computer interactions (touchless interfaces);
- computer analysis of medical images for the automatic diagnosis of selected diseases and biometric identification, based on selected types of images, e.g. microscopic images, panoramic radiographs (dental X-rays), using algorithms representing image processing, analysis and recognition areas;
- pattern recognition applied to various problems, e.g. segmentation of scanned documents and extraction of interesting parts (stamps, signatures, text blocks, tables, logotypes). A similar research is applied to traffic sign detection and recognition. Another area is the Content-Based Image Retrieval (CBIR) based on shape, color and texture analysis;
- signal processing in terms of human voice analysis oriented on vocal parameter estimation, vocalist training level evaluation and singing analysis;
- modelling and simulation of complex discrete systems, with a particular emphasis on traffic modeling. The theory of cellular automata is applied in simulations;
- analysis and development of automated trading algorithms and advanced investment strategies, using pattern recognition and machine learning (for FX, CFD and options markets);
- development of web systems supporting automated trading and analysis of investment strategies.

Offered expertise:

- expertise in evaluating innovation of technical and software solutions for interactive human-machine communication;
- development of hardware and software systems to assist people with disabilities;
- experimental and structural work based on the technical infrastructure generated to support the Laboratory of Medical Informatics and Multimedia Laboratory. Range: prototypes of electronic circuits and mechanical constructions for control purposes (including wireless remote), observation and communication;
- developing algorithms and programmes oriented at intelligent visual surveillance, including automatic detection of moving objects, scene changes and action recognition;
- human voice analysis in terms of vocalist training and its medical parameters;
- comparative safety analysis of biometric systems based on facial portraits and fingerprints;
- technical audits of systems related to visual surveillance and human-computer interaction;
- developing intelligent investment strategies for automated trading;
- developing software applicable to implementing/supporting automated trading;
- evaluation of application interfaces using neuroscience techniques.

Equipment of the Medical Laboratory:

- Slit lamp, Perimeter, Pachymeter, Audiometric cabin, Digital video ophthalmoscope, Holters, Electrocardiographs, Doppler flowmeter (ultrasound), Digital blood pressure monitors, Spirometers, Keyboards for the blind, Electronic magnifiers, Braille displays, Braille printer;
- general equipment: video cameras, thermographic camera, depth sensors (Kinect);
- audio equipment: microphones, digital recorders.

Keywords specifying the offered expertise:
medical informatics, image processing, image recognition, biometrics, visual surveillance, content-based image retrieval, computer vision, traffic modeling, automated trading, voice analysis

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology, Szczecin
ul. Żołnierska 52
71-210 Szczecin
Poland
www.wi.zut.edu.pl

Tomasz Hyla, Ph.D.

Faculty of Computer Science and Information Technology
Department of Software Engineering, Information Security Research Group
e-mail: tomasz.hyla@wi.zut.edu.pl
phone: +48 91 449 56 62

Information Security Research Group (ISRG) is working in the area of cybersecurity. ISGR's main research activities are focused on the following topics:

- **electronic signatures and trust services.** ISGR is continuously working on practical aspects of new technologies used in trust services that are based on Public Key Infrastructure or Blokchain, e.g., server-side signatures, cloud signatures, eIDAS adoption;
- **pairing-based cryptography.** ISGR is developing new asymmetric cryptography schemes (signatures and encryption) based on bilinear pairings;
- **cryptographic protocols.** ISGR is developing new authentication and key agreement protocols that can be used in conference settings and mobile environment;
- **sensitive information protection.** ISGR is building new systems that allow to store, manage and access sensitive information with mobile devices and computational clouds;
- **risk analysis and security audits.** We develop new techniques of risk assessments based on formal methods.

In the last years, ISGR participated in several projects with industry partners, e.g.:

- **Polish NCBR** applied research programme, project No. PBS1/B3/11/2012, "Mobile device for classified information protection" (2012-2015) (key words: Protection Profile, Security Target, authentication and key agreement protocols, cryptographic services based on bilinear pairings);
- **Polish NCBR** research project No. O N206 001340, "Innovative model for secure management of classified information (2011-2012)" (key word: ORCON based access control system);
- **Polish MNiSW** project No. 6 T07 203 C/06280, "System for creation of secure electronic signatures in distributed environment" (2004-2007) (key words: model and algorithms for a signature creation device, Protection Profile).

ISGR is providing expertise on daily basis to the certificate authority issuing qualified certificates for electronic signatures.

Offered expertise:

- security audits and risk analysis of information systems according to ISO/IEC 27001, ISO/IEC 20000, ISO/IEC 31000;
- development of new digital signature schemes based on pairing-based cryptography;
- designing security measures for real world applications;
- assessment of information security systems in the context of ISO/IEC 15408 and FIPS-140;
- penetration testing, security audits of web applications;
- consultancy in the field of electronic signature implementations and development;
- audits for compliance with WebTrust;
- cybersecurity trainings.

Research infrastructure:

ISGR has a laboratory equipped with: workstations, servers, reprogrammable cryptographic modules HSM (Thales/nCipher nShield F2 and F3), biometric readers (Crossmatch Verifier 320LC fingerprint readers and digital cameras), contact and contactless smart card readers, RFID readers, risk analysis software (Risicare), software development tools (e.g., Visual Studio, Enterprise Architect, XML Spy), penetrations testing software (e.g., WildPackets Omnipeek Enterprise, Hashcat, Kali Linux and other open source tools), CISCO Adaptive Security Appliance, Wi-Fi routers and external cards, networking hardware.

Keywords specifying the offered expertise:

cybersecurity, cryptography, information security, risk analysis, electronic signature, pairing-based cryptography, penetration tests, e-health security, conference authentication protocols

Information & Communication Technologies

West Pomeranian University of Technology, Szczecin
ul. Żołnierska 49
71-210 Szczecin
Poland
www.wi.zut.edu.pl

Jarosław Jankowski, Ph.D.

Faculty of Computer Science and Information Technology
Computer Technology in Education Team
e-mail: jjankowski@wi.zut.edu.pl
phone: +48 91 449 56 68

The Internet Analytics and Complex Networks team conducts research related to the analysis and optimization of Internet systems, electronic marketing technologies, and online social networking platforms. The research is related to user-oriented computing and is linked to the optimization of online and interactive systems, eye tracking and perception analysis, multicriteria decision support in systems design, modelling of social systems and diffusion processes. In addition to theoretical aspects, the work is of an applied nature and has also been implemented in cooperation with companies in the online industry as part of joint projects.

Main areas of research (fields of expertise):

- optimization of Internet systems;
- electronic marketing and social networks;
- electronic commerce systems;
- decision support in multiple conflicting criteria;
- research on the usability of Internet systems;
- modelling the issues of sustainability in information systems;
- analysis of sustainability in environmental and social areas;
- modeling, conceptualizing and utilizing domain knowledge.

Competences and skills:

- performance and usability testing;
- eyetracking studies;
- increasing conversions on web systems;
- modelling user behavior;
- optimizing user interfaces;
- analyzes of social networks;
- selection of multicriteria methods for given decision situations;
- multicriteria decision support in management;
- use of knowledge bases in solving multi-criterion problems;
- sustainability in environmental and social issues;
- evaluation of IT systems;
- usability testing of information systems;
- strategic evaluations and the selection of pro-environmental investments.

Offered expertise:

- support in the process of optimization of commercial activities on the Internet;
- support in the process of optimization of web systems;
- modelling and analysis of Internet systems;
- usability studies and perceptual studies;
- sustainability in environmental and social issues;
- evaluation of IT systems;
- usability testing of information systems;
- evaluating strategies and selecting pro-environmental investments;
- support decision in business management.

Keywords specifying the offered expertise:
electronic marketing, e-commerce, social networks, web systems

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology, Szczecin
ul. Żołnierska 49
71-210 Szczecin
Poland
www.wi.zut.edu.pl

Przemysław Korytkowski, Ph.D.

Faculty of Computer Science and Information Technology
Department of Industrial Engineering
e-mail: pkorytkowski@zut.edu.pl
phone: +48 91 449 55 94

The Industry Engineering Group consist of scientists supporting companies in optimization of production processes. Modern production processes are becoming more and more complex, and customers require shorter time of order processing, with the highest quality and the lowest price. Consequently, optimization of production is extremely important. The rapid pace of changes does not allow technologists to spend time on in-depth process analysis. On the other hand, companies often have large amounts of data which could help them to take many important decisions.

The Industry Engineering Group offers their services in a range of optimization and production process analyses.

Optimization analysis allows to:
- detect the causes of the problems;
- anticipate organizational and hardware changes;
- select the best process parameters and settings;
- determine the impact of changes in the process.

The Group offers the following analyses:
- lean management;
- simulation models;
- statistical process control (SPC);
- design of experiments (DOE);
- bottleneck analysis.

Service agreement and technical cooperation agreement are offered.

The team has extensive experience in developing analyses for business clients. Selected studies include:
- production flow redesign for manufacturer of transformers and reactors;
- standardization of maintenance operations for manufacturer of tyres and other rubber products;
- simulation of assembly lines and internal logistics for leading provider of cargo handling solutions;
- simulation and optimization of a manufacturing line for manufacturer of hearing instruments and advanced acoustics;
- optimization of the placement of ceramic components in a tunnel kiln for global manufacturer of bathroom ceramics.

Lean management:
- continuous improvement (kaizen);
- standardization;
- workplace organization (5S);
- changeover time reduction (SMED);
- Value Stream Mapping;
- Total Productive Maintenance;
- Just-in-time;
- waste reduction (muda, muri, mura);
- quality assurance (andon, jidoka, poka-yoke);
- production leveling (heijunka);
- one-piece flow.

Performance evaluation and optimization:
- bottleneck analysis (theory of constraints);
- sensitivity and uncertainty analysis;
- line balancing;
- scheduling - static, dynamic, dispatching rules;
- statistical Quality Control (SQC);
- statistical analysis - ANOVA, MANOVA, DOE, regressions;
- artificial intelligence - genetic algorithms, simulated annealing, ant colony systems, neural networks;
- multi objective optimization.

Computer simulation:
- precise modeling of manufacturing systems: cells, lines, supply chains;
- performance evaluation of manufacturing systems and supply chains;
- optimization of manufacturing systems and supply chains;
- 'What if' analysis;
- scenario analysis;
- variance analysis and variance reduction.

Keywords specifying the offered expertise:
lean management, simulation, statistical process control (SPC), design of experiments (DOE), bottlenecks analysis

Information & Communication Technologies

West Pomeranian University of Technology, Szczecin
ul. Żołnierska 52
71-210 Szczecin
Poland
www.grafika.zut.edu.pl

Professor Radosław Mantiuk, Ph.D., D.Sc., Eng.

Computer Imaging Group
e-mail: rmantiuk@wi.zut.edu.pl
phone: +48 91 449 55 45
mobile: +48 793 717 101

Computer Imaging Group consists of researchers and experts working at the Faculty of Computer Science of West Pomeranian University of Technology, Szczecin. Our research interests address activities of the human visual system (HVS). We are especially interested in developing HVS perceptual models which explain fundamental behaviours of the human vision.

Our recent research relates to:

- building models of the human visual attention. We have proposed a technique which identifies an attention target based on the temporal human gaze direction captured by the eye tracker;
- modelling the process of image quality assessment. We have proposed a technique with which to automatically identify graphics artifacts in synthetized images;
- development of image synthesis techniques. We are especially interested in real time computer graphics techniques used in computer games. We investigate how these techniques can be optimized based on information about gaze direction of a human observer;
- development and construction of eye trackers. We offer eye trackers of our own construction that are controlled by custom software;
- researching relationships between virtual 3D model parameters and durability of physical 3D prints.

We have a laboratory equipped with professional displays (including a professional OLED display), virtual reality gears, stereoscopic glasses, eye trackers, 3D printer, etc.

Offered expertise:

- implementation of real time computer graphics applications using OpenCL, OpenGL, Direct X, CUDA technologies for personal and mobile platforms;
- performing perceptual experiments;
- performing experiments with eye trackers;
- development, construction and delivery of eye trackers;
- modeling virtual 3D objects and printing these objects using 3D printers.

Keywords specifying the offered expertise:

perception, eye tracking, eye trackers, perceptual experiments, experiments with eye trackers, graphics software development, 3D printing

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology, Szczecin
ul. Żołnierska 49
71-210 Szczecin
Poland
www.kio.zut.edu.pl

Marek Pałkowski, Ph.D.

Faculty of Computer Science and Information Technology
Department of Software Engineering, Programming Techniques Group
e-mail: mpalkowski@wi.zut.edu.pl
phone: +48 91 449 56 62

Programming Techniques Group (PTG) is a part of Department of Software Engineering (DoSE). PTG's research activities are mainly focused on the following topics:

- concurrent and parallel computing using the C/C++ language for numerical computation-intensive tasks;
- code locality optimization by means of better memory and cache use due to loop nest tiling;
- development of automatic source-to-source compilers for programme loop nest parallelization and optimization for modern processors, graphic cards, and co-processors;
- development and testing of algorithms for automatic synchronization-free slicing and free-scheduling of loop nest statement instances;
- distributed and cloud computing using modern web technologies and frameworks.

Additionally, the spectrum of PTG's interests covers the following research activities:

- object programming in modern languages;
- hardware and back-end programming for dedicated and embedded systems in C/C++;
- development back-end scripts in Python;
- programming sophisticated software and compilers for Linux systems.

PTG has expertise in:

- software design and implementation using modern software engineering methods and case systems;
- advanced programming of back-end applications in C/C++, Java, and C# using relational databases;
- development of scripting systems and object programming;
- development of algorithms and mathematical approaches for academic and commercial solutions.

PTG cooperates with scientific partners involved in parallel computing and has access to highly advanced parallel systems and software.

Offered expertise:

- locality and efficiency improvements for computations-heavy systems, assistance with design and bottleneck avoidance;
- accelerating high performance programs and systems;
- development of web and industrial multi-threaded systems;
- testing and tuning commercial software;
- development of back-end algorithms for industrial solutions;
- professional courses for programmers: advanced object programming, multi-threaded programming, parallel computing and code quality;
- development of parallel and distributed code.

Modern infrastructure: laboratory equipment: 12 parallel machines with general purpose graphic processors (NVIDIA) and one machine with Tesla cards; software: TRACO compiler, Intel Compiler, Visual Studio, open-source frameworks for parallel computing, etc.

Keywords specifying the offered expertise:

programming, parallel computing, automatic parallelization, source-to-source compilers, loop nest tiling, scheduling, multi-threading, code quality

Information & Communication Technologies

West Pomeranian University of Technology, Szczecin
ul. Żołnierska 49
71-210 Szczecin
Poland
www.wi.zut.edu.pl

Izabela Rejer, Ph.D., D.Sc.

Faculty of Computer Science and Information Technology
Neuroanalysis Laboratory
e-mail: irejer@wi.zut.edu.pl
phone: +48 91 449 55 91

The Neuroanalysis Team is an interdisciplinary group of researchers engaged in EEG signal processing and analysis.

The main areas of research:

- conducting cognitive experiments with EEG recording;
- conducting experiments to test user perception of a given software;
- analysis of EEG data with artificial intelligence and statistical methods;
- development of algorithms for extracting knowledge from the EEG signal;
- development of software for brain-computer interfaces;
- development of methods for EEG signal denoising.

Fields of expertise:

- analysis of marketing content impact on the cerebral cortex activity;
- analysis of game players' brain activity;
- detecting emotion-specific brain activity patterns;
- analysis of human perception of software errors;
- development of algorithms for controlling computer applications and external devices with brain-computer interfaces based on SSVEP potentials and „movement imagery" paradigm;
- development of brain activity-controlled book reader and web browser;
- development of methods for detecting steady state visually evoked potentials (SSVEP);
- conducting research on the habituation phenomenon;
- artifact reduction in EEG signal.

Research infrastructure: The Neuroanalysis Laboratory is equipped with 3 test stands adapted to conduct cognitive experiments involving EEG signal measurements, 3 EEG amplifiers (Discovery20, EPOC, and DigiTrack) with accessories, light, sound and touch stimulators, and specialized software for processing EEG in both off- and on-line mode.

Offered expertise:

- conducting neuromarketing research and analysis;
- conducting cognitive experiments with EEG signal analysis;
- analysis of software interfaces in terms of user response to emerging mistakes;
- EEG signal denoising, processing, and analysis;
- designing brain waves-controlled computer applications;
- implementing brain computer interfaces.

Keywords specifying the offered expertise:
Cognitive experiments, Neuromarketing, Emotion detection, EEG Signal processing, EEG analysis, Artifact reduction, Brain Computer Interface, BCI, SSVEP, Habituation

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology, Szczecin
ul. Żołnierska 49
71-210 Szczecin
Poland
www.kio.wi.zut.edu.pl

Walery Rogoza, Ph.D., D.Sc.

Faculty of Computer Science and Information Technology
Department of Software Engineering, Computer Simulation Group
e-mail: wrogoza@wi.zut.edu.pl
phone: +48 91 449 55 33

Computer Simulation Group (CSG) consists of specialists working within the Department of Software Engineering of the Faculty of Computer Science.

ICSG's research activities are mainly focused on the following topics:

- big data analysis and knowledge extraction based on modern information technologies, programming platforms, and programming languages;
- information retrieval on unstructured data using classical methods and new methods of unstructured information analysis;
- methods of system identification used to the prediction of time series: new methods of time series prediction using small sets of experimental samples;
- development and use of multi-agent systems for the prediction of time series, data-mining, and optimization;
- software testing with the use of classical and new methods.

CSG has expertise in:

- software testing, data-mining, time series prediction, use of ontologies for smart system design, and development of multi-agent systems.

Offered expertise:

- technical and economic data analysis based on classical methods and new methods of system identification;
- solving optimization tasks;
- development of mathematical models of complex objects and processes;
- solution of ill-conditioned problems in computer simulation of complex objects and processes;
- development of methods for software verification and testing.

Modern infrastructure: laboratories, equipment, and programming tools.

Keywords specifying the offered expertise:
software testing, multi-agent systems, time series prediction, unstructured information, data-mining, Big Data.

West Pomeranian University of Technology, Szczecin
ul. Żołnierska 49
71-210 Szczecin
Poland
www.wi.zut.edu.pl

Przemysław Różewski, Ph.D., D.Sc.

Faculty of Computer Science and Information Technology
Computer Technology in Education Team
e-mail: prozewski@wi.zut.edu.pl
phone: +48 91 449 55 72

The Computer Technology in Education Team is a research group focusing on IT applications in education for effective knowledge transfer, knowledge modelling or learning and teaching analytics.

Fields of expertise:

- e-learning;
- competence management and processing;
- gamification and serious gaming in business;
- modelling and analysis of different didactic processes.

Skills and competences:

- e-learning content design;
- serious games for business design;
- domain competence model designs;
- ontology design;
- knowledge modelsdesigns.

Offered expertise:

- e-learning content design support;
- serious games for business design support;
- domain competence model design support;
- ontology design support;
- knowledge model design support.

Keywords specifying the offered expertise:

e-learning, ontology, OWL, gamification, serious gaming, competence management, knowledge management

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology, Szczecin
ul. 26 Kwietnia 10
71-126 Szczecin
Poland
www.foton.zut.edu.pl/en/laboratories/lomof

Dr Grzegorz Żegliński, Eng.

Faculty of Electrical Engineering
Laboratory of Microstructured Optical Fibres
e-mail: grzegorz.zeglinski@zut.edu.pl
phone: +48 91 449 51 10
mobile: +48 693 621 697

The Laboratory of Microstructured Optical Fibres (LMOF) is a part of larger research facility, the Laboratory of Teleinformatic Technologies and Photonics within the Faculty of Electrical Engineering. It is a facility where specialists pursue research on light propagation in optical photonic and hole fibers of varying geometry.

Measurements made in the laboratory comprise:

- effective refractive index;
- characteristics of waveguide and chromatic dispersion of microstructured fibres;
- polarization properties of photonic optical fibres (PCF) and hole fibres (HF, HAF), microstructured polymers (mPOF);
- transmission and propagation properties;
- impact of optical fibre cross-section geometry on transmission properties;
- bend losses in microstructured fibres;
- non-linear properties of photonic and hole structures;
- changes of optical spectrum during signal propagation in photonic and hole fibres;
- impact of temperature on propagation in microstructured optical fibres.

Laboratory equipment:

- an antivibration optical table with an active vibration damping system;
- two Thorlabs semiconductor tunable lasers, ECL type (external cavity laser), with a tuning range of 120 nm for 1300 nm and 1550 nm wavelengths, and a spectral linewidth below 1MHz;
- precise nanometric piezoelectric tables for putting light in and out of microstructured fibres.

Offered expertise:

Optical characterization of microstructured optical fibres (MOF): propagation, transmission (insertion and bending losses), dispersion (chromatic and PMD-polarization mode dispersion). Design and testing of MOF fibre components (dispersion compensators, splitters, sensors). Testing new optical fibre components in C-Band DWDM Alcatel-Lucent System. Characterization of propagation in Polarization Optical Fibre Elements (propagation characterization, Poincare sphere characterization).

Keywords specifying the offered expertise:

Optical Telecommunication Fibre, Multistructured Optical Fibre, Polarization Optical Fibre Elements

Information & Communication Technologies

5

Environment

University of Szczecin
ul. Wąska 13
71-415 Szczecin
Poland
www.km.wb.univ.szczecin.pl

Professor Wiesław Deptuła, Ph.D., D.Sc.

Department of Microbiology
e-mail: kurp13@univ.szczecin.pl
phone: +48 91 444 16 05

The Department of Microbiology (DM) is involved in research on:

- the status of aquatic environment, with a particular reference to surface waters, by assessing their sanitary level and physiological groups of bacteria and bacteriophages, assaying their F-RNA and F-DNA as well as somatic parameters, i.e. components which control the levels of microbial contamination and are thus decisive for water quality classification;
- identification and presence of environmental Chlamydia, pathogenic for mammals (humans, animals) in aquatic environment and in biological materials of animal origin (i.a. blood);
- identification of enzymes with cold-adapted B-galactozydase isolated from the environment, with the production of cold-adapted glycoside hydrolases.

The expertise offered includes:

- using microbiological assays for assessment of the status of aquatic environment.

Collaboration is sought to carry out joint projects focused on applying physiological and somatic assays of bacteria to assess the status of aquatic environments.

Keywords describing the expertise offered:
water environment, bacteria, bacteriophages

University of Szczecin
ul. Felczaka 3c
71-412 Szczecin
Poland
www.kzo.wb.univ.szczecin.pl

Robert Czerniawski, Associate Professor

Department of General Zoology
e-mail: czerniawski@univ.szczecin.pl
phone: +48 91 444 16 24

The Department of General Zoology groups specialists whose work is primarily focused on:

- restitution and protection of migratory fish, with a particular emphasis on rare species such as sea trout (Salmo trutta trutta), Atlantic salmon (Salmo salar), twait shad (Alosa fallax), sturgeon (Acipenser oxyrhynchus) and eel (Anguilla anguilla);
- behavioural biology of fish in relation to survival under natural conditions, growth, feeding and reproduction;
- adaptability of young fish (larvae and fry), particularly salmonids, to life in the wild;
- training of juvenile fish under hatchery conditions to increase their survival in streams, stocking natural waters with hatchery-reared fish is a popular way to restore salmonid populations and the group's research targets interactions between wild and hatchery-reared fish, their feeding habits, acquisition of predator avoidance behaviour, and effects of prey appearance;
- invertebrates of upstream river sections as a food base for juvenile fish; availability of food for stocked fish is a very important factor determining survival of young fish in the wild; thus, the group studies the food base (zooplankton and macrozoobenthos) of small streams stocked with salmonid larvae and fry; food selectivity is assessed by analysing fish stomach contents;
- histological analysis of fish tissue structure;
- characteristics of fish reproductive cycles;
- histological characterisation of fish and bivalve sexual cycles in the region as a contribution to the evaluation of species' expansion;
- biology and biotechnology of fish sperm (determination of basic sperm parameters; evaluation of sperm and spermatozoa quality using CASA – computer assisted sperm analysis; optimisation of fish sperm activation; sperm cryopreservation: development of cryopreservation procedures and gamete cryobanking; monitoring of development of the offspring obtained from fertilization of frozen gametes);
- fish parasites and health status (effect of environmental conditions on health status of salmonids, cyprinids and other freshwater and marine species; characteristics of micro and macroinvertebrates as intermediate hosts for fish parasites);
- migration of invasive bivalve species in the Odra catchment;
- complex analyses of hydrological and biological conditions (ichthyofauna, macroinvertebrates, plankton and macrophytes) in rivers and their catchments.

The research infrastructure includes a hatchery, sampling and diving equipment, underwater photocameras, liquid nitrogen tanks, microscopes (stereoscopic, fluorescent), a Computer Assisted Sperm Analysis (CASA) system.

The expertise offered includes:

- research on fish morphology and biology (growth, survival, feeding, reproduction, rearing and stocking);
- ecohydrological assessment of rivers and lakes via studies on zooplankton, macroinvertebrates, macrophytes, phytoplankton);
- evaluation of anthropogenic pressure on aquatic ecosystems by i.a. following temporal and spatial changes in riverine faunal communities;
- cryoprotection of fish sperm;
- identification of fish internal and external parasites.

Keywords describing the expertise offered:

fish restitution, fish biology, invertebrates, fish parasites, fish sperm cryoprotection

Environment

University of Szczecin
ul. Wąska 13
71-415 Szczecin
Poland
www.kfigr.wb.univ.szczecin.pl

Professor Jan Kępczyński, Ph.D., D.Sc.

Department of Plant Physiology and Genetic Engineering
e-mail: jankepcz@wp.pl
phone: +48 91 444 15 44

The Department of Plant Physiology and Genetic Engineering (KFIGR) conducts research on seed biology, with a special attention paid to:

- Hormonal regulation of dormancy release and seed germination;
- Reactive oxygen species and nitric oxide functions during seed dormancy release;
- Breaking seed dormancy by smoke active compounds, karrikins;
- Factors inducing secondary dormancy in seeds and affecting seed longevity;
- Applicability of seed conditioning to improve seed performance.

Other areas of interest include:

- Characterisation of indirect somatic embryogenesis systems;
- Molecular basis of ethylene biosynthesis and perception;
- Identification of transgenes in plant material;
- external and internal factors contributing to the development and maintenance of viability and vigor of agriculturally and horticulturally important seeds.

The group investigates mechanism of seed dormancy release and seed germination as well as seed ageing/deterioration using biochemical and molecular approaches. Amarathus sp. and Avena fatua seeds and Medicago sativa somatic embryos are used as research models.
KFIGR is involved in several international and national research projects and aims at developing innovative, environmentally friendly solutions to be implemented in agriculture and biotechnology industry.
The research infrastructures includes climatic chambers equipped with a wireless temperature monitoring system, incubated orbital shakers, clean benches, freezers and ultra-deep freezers, centrifuges and vacuum concentrators, UV-VIS spectrophotometers (cuvette, 96-well plate, Biospec Nano), thermocyclers (standard, gradient and real-time), horizontal and vertical electrophoresis systems, flow-cytometer, GC FID and GC MS systems, automatic system of soil temperature monitoring, bead mill homogenizer.

The expertise offered includes:

- assessment of seed germineability and vigor;
- chromatographic quantification of phytohormones, including ethylene (GC) and abscisic acid (GC MS/MS);
- flow-cytometry;
- quantification of ROS in plant materials;
- determination of enzymatic activities (ACC synthase, ACC oxidase, dehydrogenase, ascorbate peroxidase) as well as application of molecular techniques including gene expression analysis and GUS analysis (histochemical and spectophotometric).

Keywords describing the expertise offered:

seed dormancy, seed germination, seed ageing, soil seed bank, seed conditioning, ethylene biosynthesis, reactive oxygen species, nitric oxide, smoke-water, karrikins, butenolid, transgene analysis, gas chromatography, flow-cytometry, gene expression

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology, Szczecin
al. Piastów 42
71-065 Szczecin
Poland
www.iichipos.zut.edu.pl

Dr Rafał Rakoczy, Ph.D., D.Sc.

Faculty of Chemical Engineering
Department of Heat Engineering and Waste Management
Institute of Chemical Engineering and Environmental Protection Processes
e-mail: rrakoczy@zut.edu.pl
phone: +48 91 449 43 32

The Department of Heat Engineering and Waste Management (DHEWM) groups specialists working on applications of magnetic fields in various areas of chemical engineering and biomedicine.

The DHEWM research is primarily focused on:

- analysis of transport processes in chemical engineering apparatus;
- mathematical modelling of transport processes in classical and non-classical mixers;
- application of methods and techniques of artificial intelligence to describe chemical engineering operations;
- theoretical and experimental analysis of magnetic field effects on selected unit operations and processes in chemical and biochemical engineering;
- optimisation of chemical engineering set-ups;
- magneto-biology systems;
- application of information theory to describing engineering systems.

During the last year, the DHEWM submitted more than 140 full-text research papers and filed over 30 patent applications.
The DHEWM research infrastructure includes laboratories dedicated to process dynamics, mixing processes, and fluid flow.

The expertise offered includes:

- design of process systems;
- experimental validation of modelling results and mathematical modelling;
- solving process engineering problems;
- analysis of dynamics behaviour in chemical set-ups;
- analysis of fluid flow.

DHEWM seeks cooperation with R&D institutions and chemical industry in pharmaceuticals, high-performance materials, biotechnology, electronic industry, paints and plastics, petroleum refining, synthetic fibers, transport processes in chemical engineering systems, fluid flow and hydrodynamics problems, application of artificial neural network in mixing and reactor modelling and in the development of new technologies employing novel materials.

Keywords describing the expertise offered:
chemical engineering and processing, patent, biochemical engineering, analysis, mathematical modelling, mixing, chemical engineering apparatus

Environment

West Pomeranian University of Technology, Szczecin
ul. Słowackiego 17
71-434 Szczecin
Poland
www.agro.zut.edu.pl

Hanna Siwek, Ph.D., D.Sc.

Faculty of Environmental Management and Agriculture
Department of Chemistry, Microbiology and Environmental Biotechnology
e-mail: hanna.siwek@zut.edu.pl
phone: +48 91 449 63 20

The Department of Chemistry, Microbiology and Environmental Biotechnology (DCMEB) carries research focusing primarily on:

- eutrophication in shallow water reservoirs (nutrient limitation of primary production, nutrient sources);
- internal eutrophication (nutrient release from bottom sediments, fractionation of sediment-bound phosphate, sorption);
- responses of aquatic plants to pollution of aquatic ecosystems with trace metals, nutrients and xenobiotics as well as responses of aquatic plants to hydromorphological parameters of their environment;
- chemical methods of lake restoration (phosphate inactivation, formation and characterisation of intelligent and environmentally friendly biomaterials-based adsorbents);
- effects of agrochemical formulations on behaviour of active substances in the environment [degradation kinetics of agrochemicals (pesticides) in soil and water, determination of TD_{50}, determination of partition coefficients K_d, $K_{OC,}$ adsorption processes in water/soil and water/sediment systems, mobility of agrochemicals in soil].

DCMEB is involved in national projects and collaborates with other departments of the West Pomeranian University of Technology in Szczecin, Poland contributing its experience in the development of innovative and environmentally friendly solutions.
The DCMEB infrastructure includes well-equipped laboratories for the study and chemical analysis of water, soil and bottom sediments.

The expertise offered includes:

- unique knowledge on chemical analyses of water, soil, bottom sediments (analysis of nutrients, metals, agrochemical residues);
- research on phosphorolytic enzyme activity in aquatic environments and soil;
- speciation analysis of phosphorus in soil, water and bottom sediments;
- analysis of degradation kinetics of agrochemicals (pesticides) in water and soil;
- exploring mobility of chemical pollutants in soil and sediments;
- determination of partition coefficients and sorption processes (adsorption, desorption) of pesticides, metals and phosphorus compounds in water/soil and water/bottom sediment systems;
- physico-chemical modification of biomaterials;
- examination of xenobiotic effects on aquatic plants (development and implementation of experiments involving aquatic plants, evaluation of plant biometric parameters, evaluation of metal content in biomass);
- evaluation of the functioning of constructed wetlands (study of parameters characterizing sewage and aquatic plants);
- hydromorphological assessment of rivers using the River Habitat Survey (RHS) method;
- assessment of the ecological status of surface waters using the Macrophyte Index for Rivers (MIR).

Keywords describing the expertise offered:

eutrophication, phosphorus, lake restoration, pesticides, nutrient limitation, metals, mobility, biomaterials-based adsorbents, constructed wetlands, River Habitat Survey (RHS), ecological status of rivers, Macrophyte Index for Rivers (MIR)

Maritime University of Szczecin
ul. Wały Chrobrego 1-2
70-500 Szczecin
Poland
www.am.szczecin.pl/en

Dr Grzegorz Stępień, Eng.

Institute of Geoinformatics
e-mail: g.stepien@am.szczecin.pl
phone: +48 91 487 71 77
mobile: +48 668 091 700

The team consists of specialists in photogrammetry and remote sensing, geodesy and cartography and Geographic Information System whose research focuses on:

- Unmanned Aerial Vehicles;
- coordinate measuring;
- photogrammetry and remote sensing data processing;
- 3D orientation determination;
- geoinformatics application in geodesy and cartography;
- geospatial data fusion;
- 3D and 4D data modelling.

The research is conducted using infrastructure consisting of Unmanned Aerial Vehicles, Terrestrial Laser Scanner, specialised laboratories (GIS and remote sensing) and surveying equipment (GNSS, tachymetric etc.).

The research team uses specialised software for spatial data analysis and processing, and for mathematical calculations. The solutions developed are verified analytically and applied to theoretical considerations and practical problems. Spatial data serve to build 3D and 4D models which are visualized using mostly photogrammetric and Geographic Information Systems software. For the purposes of photogrammetric transformations the team uses their own algorithms based on the inverse transform operators in Hilbert Space.

The expertise offered includes:

- alternative ways of coordinate determination;
- Unmanned Aerial Vehicles surveying, data analysis, processing and applications;
- remote sensing applications and analysis (optical, infrared, hyperspectral);
- sensor orientation in space determination;
- geospatial data fusion;
- 3D and 4D data modelling;
- Geographic Information Systems analyses;
- rapid mapping using geospatial data;
- geodetic surveying;
- cartography visualizations.

Keywords specifying the offered expertise (50-200 characters including spaces):
unmanned aerial vehicles, coordinate measuring, optical imaging, 3D orientation determination, remote sensing, GIS, data fusion

Environment

West Pomeranian University of Technology, Szczecin
ul. Pułaskiego 10
70-322 Szczecin
Poland
www.itn.zut.edu.pl

Professor Maria Tomaszewska, Ph.D., M.Sc., Eng.

Department of Biotechnology,
Institute of Inorganic Chemical Technology and Environment Engineering
e-mail: maria.tomaszewska@zut.edu.pl
phone: +48 91 449 43 67

Department of Biotechnology (DB) groups specialists whose research is primarily focused on:

- water and wastewater purification using membrane techniques (ultrafiltration, microfiltration, reverse osmosis and membrane distillation);
- investigation of antifungal and antibacterial properties of nanomaterials (mainly nanomaterials used in building industry);
- photocatalytic purification of water (removal of a variety of organic contaminants from water using photocatalytic oxidation);
- membrane bioreactors (fermentation of various substances, like: whey, glycerol, cellulose, using bioreactors).

DB is involved in national and international projects; it has developed innovative, environmentally friendly solutions with a potential of industrial applications.

The DB research infrastructure includes modern analytical equipment such as an ion chromatograph, a high performance liquid chromatograph, total organic carbon analyzers, a nanoparticle size analyzer, a UV/Vis spectrometer and a variety of other laboratory equipment. Experiments are conducted using many laboratory scale and pilot scale installations.

The expertise offered includes:

- providing solutions for water and wastewater purification using membrane techniques;
- developing solutions for separation of impurities and products of bioprocesses from water;
- investigation of antifungal and antibacterial properties of nanomaterials and photocatalytic purification of water.

DB seeks cooperation in the areas indicated above, with the use of its modern infrastructure (laboratories and equipment such as IC; HPLC; TOC; UV/Vis spectrometer; nanoparticle size analyzer; ultrasonic homogenization; bioreactors; antimicrobial properties determination; ultrafiltration, microfiltration, reverse osmosis and membrane distillation systems, photocatalytic reactors).

Keywords describing the expertise offered:
membrane processes, antimicrobial properties determination, bioprocesses, photocatalytic processes

University of Szczecin
ul. Mickiewicza 18
70-383 Szczecin, Poland
www.univ.szczecin.pl

Professor Andrzej Witkowski, Ph.D., D.Sc.
Dr Teresa Radziejewska
Professor Wojciech Piasecki, Ph.D., D.Sc.

Faculty of Geosciences
Palaeoceanology Unit
e-mail: witkowsk@univ.szczecin.pl, e-mail: tera@univ.szczecin.pl, e-mail: wojciech.piasecki@univ.szczecin.pl
phone: +48 91 444 24 68, phone: +48 91 444 24 67

The Palaeoceanology Unit (PU) conducts research on:

- diatom taxonomy, ecology and biodiversity;
- application of diatoms and other siliceous and calcareous microfossils to palaeoenvironment reconstructions in aquatic systems;
- diatom culture and molecular characterisation;
- application of diatoms as indicators in environmental monitoring and water quality assessment;
- phytoplankton communities in various brackish and marine ecosystems;
- ecology and diversity of meiobenthos in various brackish and marine (including deep sea) areas;
- ecology and diversity of macrobenthos, including alien species, in various brackish and marine areas;
- application of fossil and subfossil molluscs in reconstruction of past environmental conditions;
- biological monitoring of anthropogenic disturbance effects in marine coastal ecosystems;
- fish parasites;
- climate change effects in coastal systems, including modelling of past and projection of future developments.

PU is involved in vigorous far-fetching international collaboration featuring joint research projects, support for international PhDs, and international training workshop and courses. PU scientists carry out a number of nationally funded projects and perform consultancy services for non-academic stakeholders. The PU research infrastructure includes a research boat (seaworthiness: up to 20 nautical miles offshore range) and field sampling equipment; laboratories equipped in state-of-the-art compound microscopes and stereomicroscopes with cameras and image processing capabilities; an algal culture facility; a molecular analysis laboratory; an extensive diatom collection; a comprehensive collection of diatom literature.

The expertise is offered and co-operation opportunities are sought in:

- comprehensive diatom research, including diatom culture and molecular analyses;
- innovative diatom applications (including oil extraction);
- multi-proxy approaches using diatoms, sediment-bound plant pigments, and calcareous microfossils in historical and palaeoceanological environmental reconstructions;
- phytoplankton-based tracing of water mass movement;
- meio- and macrobenthos-based biomonitoring;
- modelling of climate change effects in the coastal zone.

We have experience in Framework Programmes as a partner.

Keywords describing the expertise offered:

diatoms, algal cultures, molecular characterisation, multi-proxy, palaeoreconstructions, biological diversity, phytoplankton, meiobenthos, macrobenthos, monitoring, anthropogenic disturbance, climate change effects, coastal zone

Environment

University of Szczecin
ul. Mickiewicza 18
70-383 Szczecin, Poland
www.wnoz.usz.edu.pl/informacje-ztikm.html

Professor Kazimierz Furmańczyk, Ph.D., D.Sc.

Institute of Marine and Coastal Sciences, Remote Sensing and Marine Cartography Unit
e-mail: kaz@univ.szczecin.pl
phone: +48 91 444 23 51
mobile: +48 502 022 460

The group consists of specialists in Remote Sensing and GIS who have participated in several international EU projects: BASYS, EUROSION, MESSINA, MICORE, SatBałtyk. The group's research focuses mainly on:

- climate change effects in coastal systems, including modelling of past and projection of future developments;
- remote Sensing applications: hyperspectral and multispectral analysis of air and satellite images to solve coastal problems;
- implementing GIS applications to coastal morphodynamics and landscape analysis;
- shoreline evolution and coastal dynamics related to the sea-level rise and storm risk, and their interaction with human activities;
- analysis of short- and long-term linear and volumetric changes of the coast (dune and cliff), using aerial photographs, laser scanning and GPS RTK;
- analysis of impact of coast protection methods on the coastal behaviour;
- development of a short- and long-term coastal zone video-monitoring system;
- calculation of storm parameters in different RP: 10, 20, 50, 100 years;
- dynamic classification of the coast;
- coastal zone modelling with the X-Beach model:
  - modelling of coastal processes;
  - modelling of storm impact on coastal morphology;
  - modelling of storm impact: rip currents, beach inundation, beach and dune erosion.

Research infrastructure:

- TeraScan®Satellite SeaSpace 0.61m;
- Teledyne Odom Singlebeam Echosounder;
- TriOS Hyperspectral Radiometer;
- WET Labs Water Quality Monitor;
- Topcon GPS RTK;
- Mobotix video-camera (www.ztikm.szczecin.pl/kamera);

Specialised laboratories for: Remote Sensing (Erdas Imagine, LP360) and GIS (ESRI, MapInfo).

Previous experience in Framework Programmes:

BASYS (www2008.io-warnemuende.de/Projects/Basys/en_home.htm), **EUROSION** (www.eurosion.org), **MESSINA** (www.interreg-messina.org), **MICORE** (www.micore.eu), **SatBałtyk** (www.satbaltyk.pl)

Offered expertise:

Expertise and co-operation opportunities offered:

- development of GIS databases for coastal zone applications;
- DGPS field measurements of coastal state and changes;
- storm flood prediction (from 10y to 1ky RP);
- development of Early Warning System for storm impact forecasting;
- X-Beach model-based storm flood mapping: hazards and risks;
- simulation of climate change impact on the Polish coast;
- assessment of the effectiveness of coastal protection methods;
- Remote Sensing application to evaluation of coastal state and behaviour;
- video–monitoring of the coastal zone.

Environment

Keywords specifying the offered expertise:
coastal zone, remote sensing, coastal monitoring, coastal modelling, climate change effects, GIS, storm flood hazard and risk, anthropogenic impact

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology, Szczecin
ul. Papieża Pawła VI/3
71-459 Szczecin
Poland
www.agro.zut.edu.pl

Dr Marek Bury D.Sc., Eng.

Department of Agronomy
e-mail: marek.bury@zut.edu.pl
phone: +48 91 449 63 01
mobile: +48 606 702 560

The scientific mission of the Department of Agronomy is to carry out activities in basic and applied research on agriculture and the environment. Research of the Department is aligned with conditions of the north-western part of Poland (Szczecin Lowland) with its predominantly light (sandy) soils and addresses the following priorities:

- environmentally friendly and resource-saving cultivation of agricultural plants;
- quality production in grain crops;
- renewable raw materials / cultivation of energy crops;
- optimization of nutrient supply for sustainable management of mineral fertilization.

My interests concentrate on the following topics: cultivation of agricultural crops (oilseed-rape, soya bean, sorghum, Sudan grass, maize) and energy crops (Sida, Silphium, Miscanthus, willow) for biomass (biogas) production for energy purposes as well as cultivation and use of gluten-free crops (grain sorghum, Amaranthus) for production of foods, and interactions between plants and the environment. We look for and implement answers to problems and opportunities concerning yields, efficiency and sustainability of crop production in safe and environmentally sound ways.

Most of our research takes place at the Experimental Research Station in Lipnik near Stargard ($53^0$20`35``N and $14^0$59`10``E). We use laboratories (e.g., the Cereal Quality Laboratory) to perform conventional physiological, morphological and chemical analyses and measurements of plants.

Offered expertise:

- consulting, training, lectures and expertise in crop cultivation (cereals, corn/maize, root crops, oilseeds and legumes), seed and agricultural plant biology and weed control;
- research on agricultural and energetic plants: morphology and biology (growth, canopy structure, yield, leaf area index, leaf greenness index);
- testing new cultivars in field condition;
- experimental validation of mineral fertilizer application;
- experimental validation of herbicide use;
- chemical analyses of soil and plant material.

Keywords specifying the offered expertise:
crops cultivation, agricultural and energy plants, plant cultivar testing, fertilizers, herbicides, plant morphology, plant biology

Environment

West Pomeranian University of Technology, Szczecin
ul. Papieża Pawła VI/1
71-459 Szczecin
Poland
www.zut.edu.pl

Professor Dorota Jadczak, Ph.D., D.Sc., Eng.

Faculty of Environmental Management and Agriculture
Department of Horticulture
e-mail: dorota.jadczak@zut.edu.pl
phone: +48 91 449 62 43

The research conducted in the Department of Horticulture includes assessing effects of different cultivation methods on the yield and biological value of vegetables and medicinal plants grown under climatic conditions of West Pomerania, analyses of the essential oil profiles in common herbs, and development of cultivation methods for new vegetables and herbs.
The aim of the research is to determine contents of biologically active compounds in vegetables and medicinal plants in relation to their age and growth conditions (greenhouse, foil tunnel, open field).
The studies result in a selection of cultivation methods most effective in terms of vegetable and herb quality. Research outcomes are also used to develop recommendations for cultivation of herb and vegetable cultivars investigated.

Offered expertise:

Research on:

- assessment of yield and content of biologically active compounds in selected vegetables and medicinal plants cultivated under climatic conditions of West Pomerania;
- chemical composition of essential oils from herb plants grown in the field and under cover as pot herbs;
- possibilities of growing new vegetable and herb cultivars in terms of cultivation methods and habitat requirements;
- improvement of cultivation methods for little known vegetables, with reference to their biological value;
- integrated and organic methods of growing vegetables and herbs.

The research is aimed at enriching the range of vegetables and herbs grown in Poland, with a focus on their biological value and traditional, integrated, and organic cultivation methods.

Keywords specifying the offered expertise:
vegetables, herbs, biological value, traditional, integrated, organic cultivation methods

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology, Szczecin
ul. Słowackiego 17
71-434 Szczecin
Poland
www.agro.zut.edu.pl

Grzegorz Jarnuszewski, Ph.D.

Department of Soil Science, Grassland and Environmental Chemistry
e-mail: grzegorz.jarnuszewski@zut.edu.pl
phone: +48 91 449 64 16

Department of Soil Science, Grassland and Environmental Chemistry is a unit combining a group of specialists in environment research and effects of agriculture on the environment. The leading research subjects concern:

- soil genesis and assessment of its properties (morphological, physical and chemical) formed as a result of different ways of use;
- soil variability, assessed from the standpoint of appropriate agricultural practices, with the use of GIS tools and electromagnetic conductivity;
- protection of the edaphic environmental production potential and effects of soil erosion on soil morphology, properties and production utility; problems of urban soil and of soils degraded and devastated by agricultural and industrial practices;
- geo-botanical research and fertilisation of meadows and pasture lands, selection of grass plant mixtures and mixed pastures, production of forage and environmentally friendly grassland management;
- cultivation of energy plants;
- surface water and groundwater quality in agricultural catchment areas, anthropogenic pressure on catchment water;
- municipal and industrial waste and waste water sludge from the standpoint of their recycling for agricultural production, re-cultivation and for energy purposes;
- production of organic-mineral fertilisers with waste as a mineral fertiliser substitute (especially phosphorus), effects of municipal, industrial and agricultural waste on chemical processes in soils;
- rationalisation of organic and mineral fertiliser management from the standpoint of crop yield and soil fertility.

Our unit has experience in participating in international research projects.

Offered expertise:

Analysis of environmental conditions in various ecosystems. Study of physical and chemical properties of mineral soils, municipal waste, waste-water sludge, plant materials and fertilisers. Analysis of macro-elemental content and heavy metals in environmental samples. Determination of the energy value of plant materials and waste. Determination of surface water and groundwater quality, along with overall metrological infrastructure. Selection of grass plant mixtures for permanent grasslands in relation to the use and characteristics of permanent grassland phytocoenoses.

We have a laboratory equipped with a spectrophometer, a CNS elemental analyser, muffle furnaces, mineralisers, incubators and other facilities for analysing environmental samples. We are also in the possession of portable equipment for analyses of water and soil samples in the field.

Keywords specifying the offered expertise:

soils, geo-botanical research, wetlands, urban and industrial waste, re-cultivation, pollution, production of fertilisers, energy plants, water quality, land melioration

Environment

West Pomeranian University of Technology, Szczecin
ul. Papieża Pawła VI/1
71-459 Szczecin
Poland
www.kisa.zut.edu.pl

Adam Koniuszy, Ph.D., D.Sc.

Department of Agricultural Systems Engineering
e-mail: adam.koniuszy@zut.edu.pl
phone: +48 91 449 62 30
mobile: +48 505 309 741

Department of Agricultural Systems Engineering is a part of the Faculty of Environmental Engineering and Agriculture. Our main research activity addresses production of advanced biofuels from biomass, including waste biomass from all branches of industry.

The topics of research are:

- **gassing process:** production of a gaseous energy carrier from fractions of municipal and forestry residues;
- **pyrolysis:** processing of biomass to useful forms of energy, feedstock recycling and development of intermediate products as raw materials for further use, e.g. bio-oil;
- **electrolysis:** production of hydrogen;
- **transesterification and fermentation processes**;
- **production of algal fuel:** optimization of culture process, development and processing of algal biomass and oil.

Department of Agricultural Systems Engineering cooperates with industrial partners from the energy sector.

Research infrastructure:

Installation for biomass gassing, gas composition analyser, thermal camera, wind turbine, photovoltaic modules, microscopy, photobioreactors.

Offered expertise:

Department of Agricultural Systems Engineering has expertise in:

- technologies of biomass waste gassing;
- analysis of syngas cleaning effectiveness;
- using syngas to power internal combustion engines;
- optimization of cogeneration systems;
- preparation of inoculants for microbial biomass conversion, including lignocellulosic waste materials, and for biofiltration.

Keywords specifying the offered expertise:
advanced biofuels, renewable energy, biomass conversion, microorganisms, algae

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology, Szczecin
ul. Papieża Pawła VI/3
71-459 Szczecin, Poland
www.zut.edu.pl

Lilla Mielnik, Ph.D., Ds.C.

Romualda Bejger, Ph.D.

Department of Physics and Agrophysics
e-mail: Lilla.Mielnik@zut.edu.pl, e-mail: Romualda.Bejger@zut.edu.pl
phone: +48 91 449 64 45, phone: +48 91 449 64 47

The research conducted in the Department of Physics and Agrophysics of the West Pomeranian University of Technology in Szczecin concerns terrestrial and aquatic environmental monitoring, with a particular focus on physical and chemical properties of natural organic matter (NOM) compounds, especially humic substances (HS). A particular attention is paid to spectral analytical methods:

- UV-VIS and IR spectroscopy;
- fluorescence spectroscopy (recording fluorescence spectra: emission and excitation spectra; synchronous scan fluorescence spectra; emission-excitation matrix spectra);
- using PARAFAC model to analyses of EEM spectra;
- recording long-term delayed luminescence of humic substance solutions with a measurement set constructed in the Department of Physics and Agrophysics, West Pomeranian University of Technology in Szczecin.

The Department has experience in projects funded by national institutes and in providing consulting services for non-academic customers. The Department cooperates with national and international education and research institutions (e.g. PAS Institute of Agrophysics in Lublin; Laboratory of Molecular and Macromolecular Photochemistry, Blaise Pascal University in Clermont-Ferrand, France.

Offered expertise:

- extraction of humic fractions (humic acids, fulvic acids, bitumins);
- characteristisation of organic matter fractions by calculating absorption and fluorescence coefficients and determining total acidity as well as COOH and OH groups;
- evaluation of current trends and changes in the dynamics of organic matter in terrestrial and aquatic ecosystems;
- evaluation of changes in spectroscopic coefficients of dissolved organic matter (DOM) in environmental monitoring and water quality assessment;
- evaluation of composition of humic-like substances in fertilizers.

The Department of Physics and Agrophysics has well-equipped chemical laboratories with:

- IR and UV-VIS spectrophotometers;
- fluorescence spectrofluorometer;
- spectroradiometer;
- potentiometric titration set;
- ultrafiltration set;
- lyophyliser;
- osmometer;
- mineralization set;
- TPS portable photosynthesis meter;
- PAM-200 fluorometer;
- miniphytotrons;
- laboratory centrifuges with cooling.

A measurement set constructed at the Department of Physics and Agrophysics has functionalities to measure:

- long-term delayed luminescence of solutions of humic substances;
- ultra-weak biochemiluminescence (UBCL) of plant tissue;
- delayed luminescence of plant chlorophyll.

Keywords specifying the offered expertise:
terrestrial and aquatic environment, natural organic matter, humic substance fractions, UV-VIS and IR spectroscopy, fluorescence spectroscopy, absorption and fluorescence coefficients of organic matter

Environment

West Pomeranian University of Technology, Szczecin
ul. Pułaskiego 10
70-322 Szczecin, Poland
www.itn.zut.edu.pl

Krzysztof Karakulski, Ph.D., D.Sc., Eng.

Institute of Inorganic Chemical Technology and Environmental Engineering
e-mail: krzysztof.karakulski@zut.edu.pl
phone: +48 91 449 25 32
mobile: +48 888 736 843

Institute of Inorganic Chemical Technology and Environmental Engineering (IIChTEE) is an interdisciplinary group of specialists working within the Faculty of Chemical Technology and Engineering. IIChTEE's research activities are mainly focused on the following topics:

- catalytic processes and catalysts (development of novel catalysts for ammonia synthesis, oxidation of methane to oxygenates, hydrogenation of organic compounds, advanced oxidation processes, photocatalytic degradation of organic water contaminants, photocatalytic building materials and self-cleaning surfaces, TiO_2-based photocatalysts);
- membrane separation processes (reverse osmosis, nanofiltration, ultrafiltration, membrane distillation, treatment and purification of water, industrial wastewater treatment and reuse, removal of volatile components from solutions, integrated/hybrid membrane systems for treatment of oily wastewater, desalination of brines and saline water, water reclamation);
- biotechnology and microbiology (biological wastewater treatment, membrane bioreactor, antifungal and antibacterial activity of photocatalysts, water/wastewater disinfection);
- new technologies and modernization of chemical technology (post-combustion CO_2 capture on new activated carbon-based solid sorbents; carbon nanotubes and titanium materials, including those modified with amines; development of novel nontoxic phosphate pigments for anticorrosive paint formulations; novel molecular structures based on palladium and mesoporous carbon nanospheres for hydrogen storage; preparation of controlled-release fertilizers);
- nanotechnology (synthesis, characterization and functionalization of nanocrystalline materials; multiwall carbon nanotubes functionalized by heteroatoms; development of novel multifunctional graphene-based biosensors for medical diagnosis).

Additionally, IIChTEE is involved in the following:

Preparation of asymmetric membranes from different polymers, modification of carbonaceous materials, development of novel photocatalytic materials for environmental applications, preparation of carbon sorbent from polymer waste, modified TiO_2 which exhibits photocatalytic activity in the visible radiation, novel building materials with self-cleaning and antibacterial properties, synthesis and characterization of carbon nanotubes, nanocapsules and nanofibers, nanocrystalline nitrides, carbides and oxides, porous nanocomposites based on carbon nanostructures and metal-organic frameworks, management and recovery of phosphates from waste streams, photocatalytic production of hydrogen, biotechnological conversion of glycerol to polyols and dicarboxylic acids, management of effluents from urea production plants.

IIChTEE has expertise in:

- synthesis, characterization and functionalization of nanocrystalline materials;
- application of TiO_2 based photocatalysts for various technological and industrial processes;
- preparation of controlled-release fertilizers;
- hydrogen storage and photocatalytic production of hydrogen;
- biotechnological conversion of glycerol.

Offered expertise:

TiO_2 based photocatalysts (preparation, characterization, modification/improvement of properties), nanomaterials (synthesis, characterization and functionalization), mesoporous carbon nanospheres for hydrogen storage, photocatalytic production of hydrogen, medical diagnosis using graphene-based biosensors, preparation of controlled-release fertilizers, photocatalytic building materials with self-cleaning and antibacterial properties, asymmetric membranes (preparation, characterization and application), biological wastewater treatment utilizing membrane bioreactor, pressure-driven membrane processes (RO, NF, UF and MF) for water and wastewater treatment, desalination of brines and saline waters using membrane distillation, integrated/hybrid membrane systems for treatment of oily wastewater, removal of volatile components from solutions, CO_2 capture using solid sorbents based on activated carbon, carbon nanotubes and titania materials

Modern infrastructure: laboratories, analytical equipment: SEM, AFM and TEM microscopes, UV-Vis/DR, FTIR/DRS and Raman spectrometers, AES-XPS-LEED-SM, XRD, XRFS, TG/MS, surface area and pore size analyzer, laser particle size analyzer, HPLC, IC, GC/MS, ICP-AES, TOC analyzer, elemental analyzers (O,N,H,C,S) and other instruments.

IIChTEE has pilot plants (MF/UF and NF/RO, MD) and several laboratory-scale membrane installations (MF/UF, NF/RO, MD) available for research. The systems utilizing pressure-driven membrane processes can be operated with either ceramic or polymeric membranes. The pilot plants are equipped with the commercial membrane modules in tubular and spiral-wound configuration. These enable us to perform the feasibility studies on a commercial scale to evaluate the performance of developed technologies.

Environment

Keywords specifying the offered expertise:
nanomaterials, TiO_2 based photocatalysts, carbon sorbents, nontoxic phosphate pigments, self-cleaning and antibacterial building materials, biotechnological conversion of glycerol, membrane bioreactor, hydrogen storage, controlled-release fertilizers

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology, Szczecin
ul. Kazimierza Królewicza 4
71-550 Szczecin
Poland
www.zut.edu.pl

Dr Katarzyna Stepanowska, D.Sc., Eng.

Faculty of Food Sciences and Fisheries
Hydrochemistry and Aquatic Biological Resources
e-mail: greyseal@o2.pl
e-mail: katarzyna.stepanowska@zut.pl
phone: +48 91 449 66 82

The research team studying the ichthyofauna is a group of specialists working within the Faculty of Food Sciences and Fisheries.
The research activities are focused mainly on:
- biology and population dynamics of southern Baltic fish;
- biology and population dynamics of Antarctic fish.

The research team studying the ichthyofauna has expertise in:
- fish monitoring;
- fish biology analysis (e.g. fish growth rate; fish age).

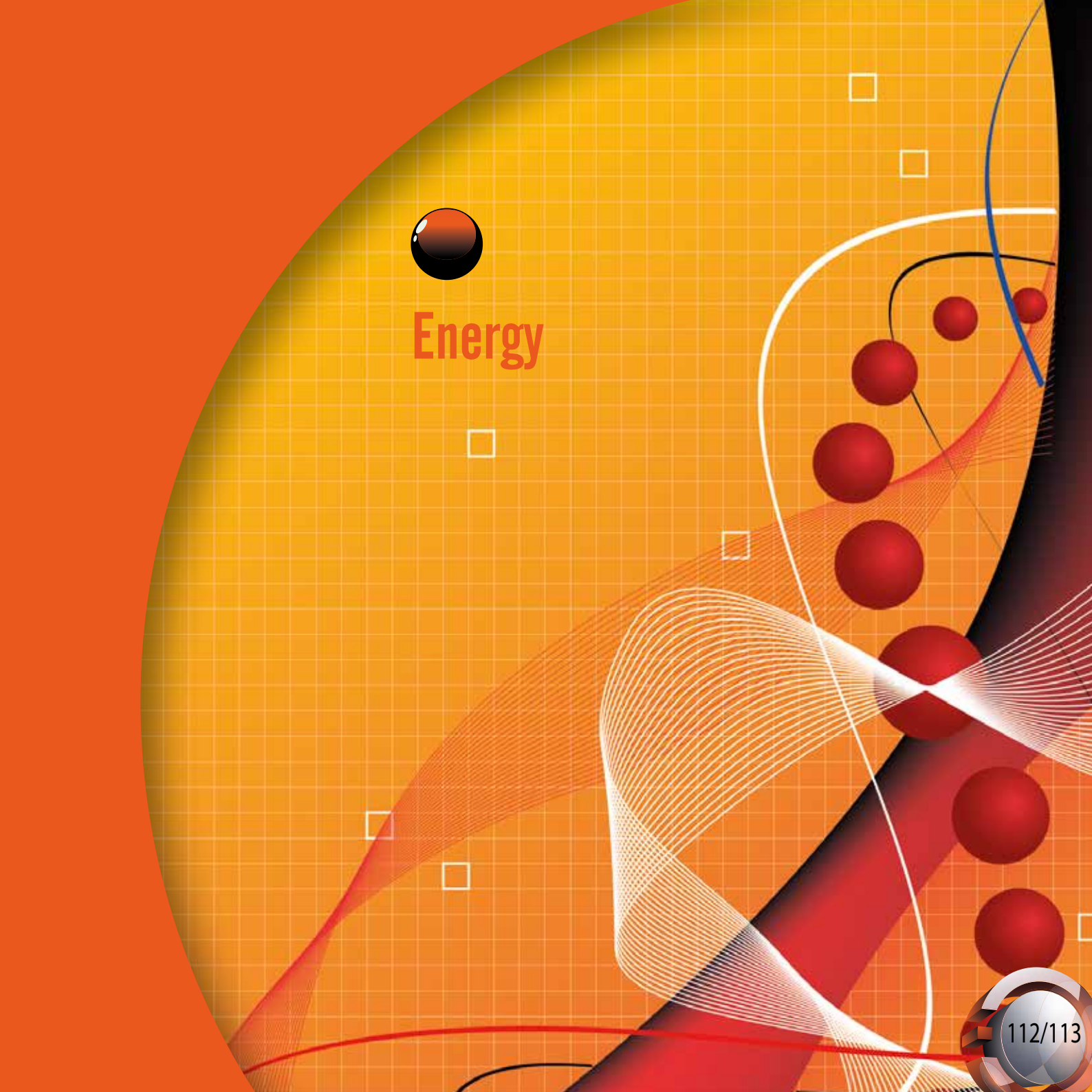
Offered expertise:
The team offers expertise in:
- knowledge support (e.g. fish biology; fisheries techniques);
- fish monitoring;
- fish biology analysis;
- fishing gear selectivity analysis.

Equipment:
- boats;
- fishing gear (e.g. Nordic nets; gill nets; hooks).

Keywords specifying the offered expertise:
fish monitoring, ichthyofauna, fishing gear, southern Baltic, marine- brackish- freshwater fish

Environment

6


Energy

West Pomeranian University of Technology, Szczecin
ul. Sikorskiego 37
70-313 Szczecin
Poland
www.ketii.zut.edu.pl

West Pomeranian University of Technology Szczecin

Professor Tomasz Chady, Ph.D., D.Sc., Eng.

Department of Electrical and Computer Engineering
e-mail: tchady@zut.edu.pl
phone: +48 91 449 41 34
mobile: +48 692 202 124

The Department of Electrical and Computer Engineering (DECE) is among Polish R&D leaders in application of electromagnetic methods for non-destructive testing (NDT). The group has participated in numerous national and international research projects. DECE scientists are members of scientific organizations such as the World Federation of Nondestructive Evaluation Centers (WFNDEC) and have served on Scientific Programme Committees of 18th and 19th World Conferences on Non-Destructive Testing (WCNDT), International Symposium on Applied Electromagnetics and Mechanics (ISEM), International Workshop on Electromagnetic NonDestructive Evaluation (ENDE) and International Symposium on Theoretical Electrical Engineering (ISTET). In the last decade, the DECE research potential has been systematically expanded. Currently, the DECE research is focused primarily on:

- multi-frequency eddy current non-destructive testing;
- vector magnetic field measurements;
- magnetic flux leakage and Barkhausen noise method;
- high frequency (terahertz and microwave) NDT systems for testing of composites;
- digital and computer radiography;
- active thermography;
- numerical analysis of electromagnetic fields;
- artificial intelligence algorithms for NDT;
- data fusion algorithms;
- algorithms of automatic defects recognition.

The DECE infrastructure consists of laboratories equipped with the state-of-the-art equipment for computer and digital radiography, THz inspection, application of various electromagnetic evaluation methods (eddy currents, magnetic field flux leakage, Barkhausen noise) and thermography.

The expertise offered includes:

- developing and constructing new, innovative electromagnetic NDT systems;
- construction of electromagnetic transducers for NDT and materials testing with NDT methods, including radiographic, terahertz, thermography and eddy current techniques;
- developing methods and algorithms for automatic NDT testing, especially including algorithms for artificial intelligence and data fusion, and numerical electromagnetic field analysis by means of finite element method with special emphasis on computer simulations of eddy current NDT systems.

DECE seeks cooperation opportunities in inspection of composite materials, designing and developing software for NDT systems with advanced analysis of measurement data and in developing advanced methods for automatic analysis of radiographic images and automatic defect recognition.

We have experience in Framework Programmes as a partner.

Keywords describing the expertise offered:

NDT, eddy current, magnetic flux leakage, Barkhausen noise, data fusion, automatic defect recognition, digital radiography, artificial intelligence, thermography, THz, electromagnetic field analysis

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology, Szczecin
ul. Sikorskiego 37
70-313 Szczecin
Poland
www.we.zut.edu.pl

Dr Marcin Hołub, Eng.

Faculty of Electrical Engineering
Department of Electrical Engineering and Drives Power Electronics Laboratory
e-mail: Marcin.Holub@zut.edu.pl
mobile: +48 725 860 950

The Power Electronics Laboratory (PEL) focuses on modern industrial electronics, control systems and power electronic supply units.
The major areas of research include:

- high efficiency power supply units for non-thermal plasma systems;
- highly integrated control units based on modern microcontrollers and DSPs;
- custom power electronics and special topologies for microwave and UV generation;
- electrical machine control and supervisory systems;
- plasma system operation and measurements;
- contactless power supplies;
- power electronic system modelling and simulations.

The PEL scientists are skilled in modelling (Plecs, Simplorer, Simulink, Maxwell, Gecko Circuits), analysis, design and prototype construction of power electronic units (up to 50kW), control systems (Texas Instruments Code Composer) and measurement units.
The PEL research infrastructure includes modern digital oscilloscopes (LeCroy, Tektronix), measurement probes for current (Norma, Pearson, Hall-effect, Rogowski coil), voltage (up to 40kV), temperature (iR Camera), short term iCCD imaging, power quality measurement devices (Norma 5000, 12 channels), LabView measurement and communication cars (CRio, Ni-Daq systems).

The expertise is offered and cooperation sought in:

- power electronics (analysis, modelling, testing, prototype development, experimental analysis);
- industrial electronics (development, analysis, construction);
- frequency converter technology;
- plasma systems and non-thermal plasma technology (power electronic supply and control units, industrial applications, deodorisation, VOC reduction, NOx/SOx reduction, water purification, ozone measurement, FTIR analysis);
- measurement systems (development, data analysis), remote control units (using RF and Wi-Fi technologies);
- renewable energy conversion systems;
- electrical machine construction and control, control systems;
- measurement units;
- experimental and digital analysis;
- prototype construction and development;
- PCB development;
- DSP and microcontroller hardware and software development;
- modern measurements (high-end oscilloscopes, power quality monitors, thermal analysis, efficiency tests and optimisation).

Keywords specifying the offered expertise:
power electronics, non-thermal plasma systems and technology, control units, industry applications, industrial electronics, high voltage power supplies, pulsed supplies

Energy

West Pomeranian University of Technology, Szczecin
al. Piastów 42
71-065 Szczecin
Poland
www.pmgeng.zut.edu.pl

Professor Zdzisław Jaworski, Ph.D., D.Sc., Eng.

Paulina Pianko-Oprych, Ph.D., D.Sc., M.Sc., Eng.

Faculty of Chemical Technology and Engineering, Process Modelling Group
e-mail: jaworski@zut.edu.pl
phone: +48 91 449 40 20
e-mail: paulina.pianko@zut.edu.pl
phone: +48 91 449 47 31

The Process Modelling Group (PMG) is a research team specialised and experienced in numerical modelling of transport processes by means of both process simulation tools and Computational Fluid Dynamics. The PMG's laboratories of Reactor Engineering as well as of Fluid Flow make it possible to experimentally validate hydrodynamic and process conditions. PMB has participated in several national and EU research projects. Modelling of energy systems with Solid Oxide Fuel Cells has been developed in the SUAV Project of FP7.

The PMG research infrastructure consists of laboratories featuring:

- facilities for numerical modelling of transport processes (6 servers and licenses for CFD code: ANSYS/Fluent, COMSOL both with fuel cell module, and for PSE code: AspenONE);
- a high pressure reactor for multiphase equilibrium measurements;
- ALPHA FT-IR Spectrometer of BRUKER with diamond ATR module, gas and liquid cells;
- a Laser Doppler Anemometer (LDA);
- stirred and static mixers.

The expertise is offered and co-operation sought in:

- numerical modelling by means of Computational Fluid Dynamics (CFD - ANSYS Fluent, COMSOL) and process simulator (PSE – AspenONE & OLI), and Computational Chemistry (CCH - Tinker) of process engineering problems;
- numerical modelling by means of Finite Element Methods (FEM – ANSYS Mechanical) of thermal stresses;
- development of an interface enabling joint application of integrated, multiscale modelling by means of the PSE, CFD and CCH packages using the CAPE-OPEN standards;
- balance of plant simulation of process systems including fuel cell systems;
- CFD modelling of hydrodynamics, species transport and current distribution in fuel cells;
- CFD modelling of non-Newtonian fluid flow;
- R&D of reactor processes;
- experimental validation of: thermodynamic equilibrium and hydrodynamic conditions, including turbulent or complex rheology flows.

We have experience in Framework Programmes as a partner.

Energy

Keywords describing the expertise offered:
process modelling, CFD, system modelling, fuel cells, plant optimisation

Koszalin University of Technology
ul. Śniadeckich 2
75-453 Koszalin
Poland
www.tu.koszalin.pl/eng

Professor Tomasz Krzyżyński Ph.D., D.Sc., Eng.

Institute of Technology and Education
Solar Thermal Energy Lab
e-mail: lbks@tu.koszalin.pl
phone: +48 94 348 65 31

Solar Thermal Energy Lab (STEL), established in 2012 at Koszalin University of Technology cooperates with business by testing different types of solar thermal collectors. The purpose of our research is to increase thermal efficiency of solar water collectors. The durability and efficiency of solar collectors is tested with high quality testing devices, sensors and special software. The infrastructure includes an array of sensors: first class pyranometers and albedometers, electromagnetic flow meters, anemometers, temperature and pressure sensors, barometric transmitters, temperature and humidity transmitters, and thermal imaging camera. Our laboratory has several measurement stations which allow to test any kind of solar collectors.
The most important part of research infrastructure is a special dedicated hydraulic energy dissipation system which allow to examine, with high accuracy, the performance of water solar heaters according to EN 12975. The infrastructure includes also a low temperature and rain chambers for extreme weather conditions simulations. Also, the solar radiation simulator compatible with ASHRAE 93-77 standard allows to conduct steady state test procedures. Solar collectors are tested also under natural weather conditions on an outside platform.

The expertise offered includes:

- solar collector test according to EN 12975;
- determining the correlation between collector efficiency factor and material content;
- testing selective layers of absorbers;
- determining influence of absorber geometric structure on thermal efficiency;
- determining thermal characteristics of solar collectors with a modified flow path;
- thermal imaging of temperature distribution on absorbers surfaces;
- describing thermal behaviour of solar collectors under dynamically changing weather conditions;
- optimising geometrical structure of flat-plate PT and ST type solar collectors;
- evaluating effects of temperature distribution on absorber efficiency;
- determining transition states of heat pipe solar collectors.

Keywords describing the expertise offered:

solar collector, flat-plate collector, vacuum tube collector, efficiency, irradiance, geometric and physical parameters

Energy

Koszalin University of Technology
ul. Śniadeckich 2
75-453 Koszalin
Poland
www.tu.koszalin.pl/eng

Dr Waldemar Kuczyński, Eng.

Faculty of Mechanical Engineering
e-mail: waldemar.kuczynski@tu.koszalin.pl
phone: +48 94 347 84 20

The unit is involved in the Regional Initiative of Cooperation in Energy Conversion (RICEC) which groups specialists in various disciplines working on the conversion of energy obtained from biomass, application of the energy carriers obtained, and quality assessment of energy processes and their environmental impact. The experts are employed at various faculties of the Koszalin University of Technology (Economic Sciences, Civil Engineering, Environmental Sciences and Geodesy, Mechanical Engineering) and the West Pomeranian University of Technology in Szczecin (Mechanical Engineering and Mechatronics, Environmental Management and Agriculture). RICEC has also members from the business sector (Bio-Tech Polska and Acuo Energy). The RICEC research is primarily focused on renewable energy resources and their application, with a particular emphasis on:

- energy-yielding plant modern cultivation methods;
- innovative methods of biofuels production from energy plants, animal wastes and municipal sewage;
- classical methods of determining the energy value of solid, liquid and gaseous biofuels;
- biofuel conversion into power and heat in distributed and centralized systems with ORC power units.

RICEC uses hi-tech laboratories and other infrastructure operated by its members. The research infrastructure includes, i.a. a Junkers calorimeter for determination of combustion heat and caloric value of gaseous fuels; a viscometer for determination of dynamic viscosity of liquid and gaseous fuels: a Höppler viscometer; a digital Brookfield DV-II+ Pro viscometer; an analogue Brookfield viscometer; a pipe furnace; an exhaust-gas analyser as well as thermal cabinets, a muffle furnace, a calorimeter, and a UV-VIS spectrophotometer.

The expertise offered includes:

- determining economic efficiency of energy plant cultivation, including cultivation and quality assessment of willow kept on light soils;
- testing biomass production for energy purposes;
- assessing of pollutant emissions in biomass combustion;
- exploring possibilities for conversion of sewage sludge from municipal sewage treatment plants to energy;
- determining energetic efficiency of annual plant species biomass;
- determining energetic efficiency of sorghum biomass;
- analysing applicability of annual plant species to biogas production;
- exploring possibilities of applying biotechnologies for production of fuels from biomass;
- examining energy characteristics of solid, liquid and gaseous biofuels;
- exploring possibilities of using small power ORC units fed with low-processed biomass in distributed cogeneration systems of electricity and heat.

Keywords describing the expertise offered:

energy plants, biofuels, bioenergy conversion, distributed cogeneration in ORC systems

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology, Szczecin
al. Piastów 48
70-311 Szczecin
Poland
www.if.zut.edu.pl

Dr Janusz Typek, D.Sc.

Faculty of Mechanical Engineering and Mechatronics
Institute of Physics
Solid State Physics Group
e-mail: typjan@zut.edu.pl
phone: +48 91 449 49 06

The Solid State Physics Group (SSPG) is one of four groups active at the Institute of Physics within the Faculty of Mechanical Engineering and Mechatronics. SSPG groups 4 faculty members (3 professors and 1 post-doc) and 2 PhD students. The SSPG research focuses on:

- magnetic characterisation of magnetic nanoparticles and nanocomposites;
- investigations of paramagnetic impurities in diamagnetic matrices;
- the role of magnetic centres in catalysts;
- theory of complex geometrical optics of non-linear media;
- theory of plasma waves.

SSPG cooperates with other faculties of the West Pomeranian University of Technology and with outside scientific groups (Athens University, Demokritos Centre, Zielona Gora University, Gdansk University of Technology). One SSPG member is involved in The European Atomic Energy Community (EURATOM) programme.

The SSPG research infrastructure includes:

- magnetic resonance spectrometer (Bruker E 500) with Oxford helium cryostat (4 - 300 K);
- X-band electron paramagnetic resonance spectrometer with high-temperature unit (up to 300°C);
- SQUID magnetometer MPMS XL-7 from Quantum Design.

The expertise offered includes:

- magnetic characterization of solid state samples (crystals, powders, nanopowders) in a wide temperature range (2 - 800 K) and in magnetic fields up to 7 T on SQUID magnetometer;
- registration and interpretation of paramagnetic resonance spectra of rare-earth and iron group ions in solid and liquid samples in a wide range of temperatures (4 - 600 K);
- registration and interpretation of ferromagnetic resonance spectra of magnetic nanoparticles.

SSPG seeks cooperation in nonlinear dynamics of plasma modes and complex geometrical optics method for beam propagation in non-linear media.

Keywords specifying the offered expertise:
electron paramagnetic resonance, magnetic nanoparticles, magnetic properties of materials, ferromagnetic resonance, plasma waves, complex geometrical optics

Energy

7

Transport

Maritime University of Szczecin
ul. Wały Chrobrego 1-2
70-500 Szczecin
Poland
www.am.szczecin.pl/en

Professor Piotr Jan Bielawski, Ph.D., D.Sc., Eng.

Marine Machinery Diagnostics and Maintenance Department
e-mail: p.bielawski@am.szczecin.pl
phone: +48 91 431 85 40
mobile: +48 600 829 052

The research group's expertise involves both the specialist knowledge and extensive experience stemming from many years of sea-going work, which ensures that theoretical solutions proposed are testable in and applicable to real-life working conditions. The Department uses a well-equipped Laboratory of Marine Power Plants consisting of a real operating ship's engine and numerous devices that monitor its work. The group members' expertise involves maintenance of ship machinery: machine assembly, repairs of machines and machine elements, and machine diagnostics, with a particular reference to diagnostics of reciprocating machines. The team specialises in:

- non destructive testing of machine elements;
- quality testing of machine assemblies;
- vibration diagnostics of non-reciprocating and reciprocating machines;
- renovation of machine elements.

The expertise offered includes:

- predictive maintenance of major ship's and land-based machines with the purpose of improving their efficiency, profitability, and operational safety by integrating and optimising management and maintenance, real time monitoring, and application of decision support tools to prevent and handle emergency situations in machine operation;
- determination of machine maintenance boundaries;
- monitoring of machine condition and identification of components in need of repair during maintenance operations;
- conservation, inspections and repair technologies;
- identification of symptoms and application of permanent diagnosis sensors for piston-crank mechanism machines;
- monitoring the condition of connecting-rod head bearing, crosshead bearing, connecting-rod big end bearing and main bearings;
- model based determination of axial and torsional vibration;
- measurement and evaluation of mechanical vibration of reciprocating machines.

The research group is interested in cooperating in:

- the design and construction of diagnostic subsystems (sensors, data acquisition & analysis, decision support tools) for individual major machine types;
- identification of machine status;
- assessment of component quality before and after repair;
- evaluation of assembling quality and diagnosis;
- monitoring the state of marine & land power plants;
- determination of machine component tribological wear;
- optimization of machine repairs;
- diagnostics of machine bearings, seals, shafts, and valves.

Keywords referring to the expertise offered:

reciprocating machines, piston-crank, marine propeller shaft, tribological wear, technical diagnostics, vibro-acoustic signals, rotating shaft vibration, shaft journal centre, torsional & axial vibrations

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology, Szczecin
al. Piastów 19
70-313 Szczecin
Poland
www.keps.zut.edu.pl

Professor Jacek Eliasz, Ph.D., D.Sc., Eng.

Faculty of Mechanical Engineering and Mechatronics
Department of Automotive Engineering
e-mail: jacek.eliasz@zut.edu.pl
phone: +48 91 449 48 11
mobile: +48 601 849 590

The Department of Automotive Engineering (DAE) groups experts in engineering sciences who specialise in construction and operation of machines for construction and operation of motor vehicles and road transport, and who conduct research on:

- improving the efficiency of engines through a variety of charging systems (dynamic, combined, sequential) and reducing load losses through the piston-ring-cylinder system;
- applicability of plant-based fuels (first and second generation bio-fuels) for power automotive engines;
- pre-treatment of catalyst coated injectors;
- vehicle life cycle analysis;
- combustion of conventional and unconventional fuels in oxygen and hydrogen.

DAE has been involved in nationally funded and international research projects.

The DAE research infrastructure a well-equipped laboratory featuring:

- two modern dyno test benches for testing internal combustion engines;
- research equipment for fuel systems;
- modern equipment to measure emissions;
- diagnostic equipment and tools.

The expertise offered includes:

- developing technically innovative solutions for motor vehicles servicing, durability testing of trucks and truck engines (STAR);
- research on engine efficiency and emission of toxic exhaust components;
- knowledge gained from using plant-based fuels and their mixtures with diesel oil;
- operational testing and evaluation of air filters for military vehicles and material modelling;
- energy modelling and environmental modelling of the vehicle life cycle.

Keywords describing the expertise offered:
motor vehicles, internal combustion engines, motor vehicles operation, vehicle LCA, energy and environmental aspects of road transport

West Pomeranian University of Technology, Szczecin
al. Piastów 41
71-065 Szczecin
Poland
www.kliet.zut.edu.pl

Dr Ludmiła Filina-Dawidowicz, Eng.

Dr Magdalena Kaup, Eng.

Faculty of Maritime Technology and Transport
Department of Logistics and Transport Economics
e-mail: lufilina@zut.edu.pl, e-mail: mkaup@zut.edu.pl
phone: +48 91 449 40 05, phone: +48 91 449 44 28

The Department of Logistics and Transport Economics (DLTE) groups specialists working primarily on:

- innovative transportation techniques and technologies (all transport modes);
- innovative design solutions (handling equipment, transport vehicles and loading units);
- alternative environmentally friendly engines including LNG– fuelled and exhaust gas cleaning technologies;
- transport and storage (coolers, freezers) of processed and unprocessed foods;
- integrated transport cold chains (containers or bulk);
- modern solutions in passenger ships and boats (sea, short sea, inland and river-sea shipping);
- implementation of Intelligent Transport Systems (ITS);
- safety of transport vehicles.

The DLTE scientists focus on the concept of seagoing, inland and river-sea ships also boats used for different purposes and applications (including commercial fishing, waterborne recreation and tourism). DLTE has been involved in international and national projects dealing with development of innovative, environmentally friendly transport solutions. DLTE cooperates with businesses in the transport and manufacturing sectors, including seaports, food carriers, logistic and forwarding companies, vehicles manufacturers, design offices and maritime corporations. DLTE has well equipped modern computer laboratories with software appropriate to solving transportation problems, including interoperability of different transport modes and co-operation of multi-mode transport systems.

The expertise offered includes:

- determination of technical and operational conditions for lifting and handling equipment;
  - assessment of technical objects and developing their models;
  - supporting of freight documentation and logistics processes;
- developing functional and spatial solutions (in logistics centres, seaports, container terminal, etc.);
- developing risk-management procedures for identification, assessment and monitoring of transport & handling risks of all types;
- research in conceptual design of innovative multipurpose ships, motorized barges, inland and coastal boats, as well as other means of transportation;
  - analyses of technical and operational parameters of various transport vehicles;
  - development of safe food transport chains and fishing fleet modernization;
  - development of concepts for comprehensive enhancement of tourism industry;
  - application of alternative environmentally friendly engines in water transport.

Keywords specifying the offered expertise:
sea, inland and river-sea shipping, innovative transportation techniques and technologies, chilled and frozen cargo transportation, multipurpose transport vehicles, environmentally friendly engines

University of Szczecin
ul. Cukrowa 8
70-453 Szczecin
Poland
www.univ.szczecin.pl

Dr Dariusz Milewski

Faculty of Management and Economics of Services
Department of Transport Systems and Policy
e-mail: dmilewski1967@gmail.com
phone: + 48 91 444 31 55
mobile: + 48 502 344 518

Department of Transport Systems and Policy (DTSP) deals with wide issues of transportation, freight forwarding and logistics across modes of transport (land, sea, air, intermodal) in:

- transport policy;
- transport economy – road, railway, waterborne, intermodal, passenger transport;
- technology of transport;
- international transport chains;
- organization of forwarding and transport;
- transport and business logistics (inventory and warehouse management, manufacturing, JIT);
- optimisation and modelling of logistics and transport chains.

The DTSP staff has participated in national and international research projects and workshops as well as in the activities of international institutions and organizations, and has provided expertise and consultancy services for companies and institutions. The staff members have professional experience in business (transport, trade and manufacturing companies).
DTSP collaborates with universities, R&D institutes, businesses and institutions in Poland and abroad.

The expertise offered includes:

- research in effectiveness in transport and logistics;
- projects involving transport and its effects on socio-economic development;
- solving problems of integration in transport chain, transport technologies, optimisation, and process modelling.

DTSP seeks collaboration in:

- transport policy (local, regional, national, European);
- city logistics and transport (concept of city transport functioning, transportation problems in agglomerations);
- innovation in transport and logistics (transport and information technologies);
- development of modelling and decision-making tools (models of logistics chains, transportation systems);
- intermodal transport and transport chains.

We have experience in Framework Programmes as a partner.

Keywords specifying the offered expertise:
passenger transport, freight transport, logistics, supply chain, economical effectiveness, optimisation, modelling, transport policy, sustainable development, external transport costs, transport technology, transport chains, transport corridors

Transport

Maritime University of Szczecin
ul. Wały Chrobrego 1-2
70-500 Szczecin
Poland
www.am.szczecin.pl/en

Professor Zbigniew Pietrzykowski

Faculty of Navigation
e-mail: z.pietrzykowski@am.szczecin.pl
phone: +48 91 480 94 96
mobile: +48 505 726 464

The NAVDEC research group of the Faculty of Navigation consists of 16 researchers and experts representing different fields: navigation, geodesy, computer sciences, automation and control, IT, ICT.

The group includes 3 professors, 6 Ph.D.'s, 3 assistants, and 4 experts. Six of the group members are officer patent-holders, including 3 master mariners. The research infrastructure used by the group includes more than 20 specialised simulators and laboratories such as ECDIS (Electronic Chart Display and Information System), GIS (Geographic Information System), Full-Mission Simulator, ARPA (Automatic Radar Plotting Aids) and 4 computer laboratories. Important infrastructure components are research and training ships owned by the Maritime University of Szczecin, particularly the MV Nawigator XXI. The group's research achievements include building a prototype NAVDEC navigational decision support system, the world's first navigational tool to perform information functions and those typical of decision support systems. Its innovative functionalities, significantly extending the performance of devices generally carried by ships, have been a subject of patent applications filed at home and internationally; the latter involve a patent application filed with the European Patent Office for "A method and system of navigational decision support in the process of safe vessel navigation". Application of the system with new functionalities will ensure raising the navigational safety to a higher level and thus reduce the marine accident risk. **This in turn will result in the following benefits:**

- social, due to lower personnel injury rate and reduced loss of life on board ships;
- material, due to reduced cargo losses and fewer damaged or sunk ships;
- environmental, due to a better protection of the marine environment and prevention of ecological disasters that might occur as a result of collisions of ships carrying dangerous goods.

The expertise offered includes:

- analysis and assessment of navigational situations based on simulations performed using real data and modern computer technologies;
- navigation-related decision support in collision situations via a shipboard decision support system installed on the navigational bridge of merchant vessels (sea-going and inland shipping), leisure boats (e.g. sailing ships, motor yachts), and as a component of land-based vessel traffic services systems (VTS, VTMS, VTMIS, RIS);
- analysis and assessment of marine accidents at sea and on inland waterways via a system intended for experts working for maritime courts;
- marine officer training courses in Collision Regulations via application of specialised modules of navigational simulators (e.g. ship-handling, ECDIS);
- design and construction of computer systems supporting decision making processes and actions taken by navigators on board ships and in land-based centres;

The key areas include:

- automatic navigational data acquisition and distribution;
- analysis of navigational information and generation of solutions to collision situations accounting for the Collision Regulations and marine good practice;
- communication, co-operation and co-ordination of actions with other ships and land-based centres responsible for vessel traffic management (VTS and others);
- interaction with a navigator supervising the system.

Keywords describing the expertise offered:

ICT, water transport, safety of navigation, decision support systems, artificial intelligence, COLREGs, collision avoidance

Maritime University of Szczecin
ul. Wały Chrobrego 1-2
70-500 Szczecin
Poland
www.am.szczecin.pl/en

Dr Wojciech Ślączka

LNG Transport Technology and Maritime Risk Analysis Centre
e-mail: w.slaczka@am.szczecin.pl
phone: +48 91 480 95 24

LNG Transport Technology and Maritime Risk Analysis Centre groups experts providing services in:

- tanker and terminal operations risk analysis;
- Liquid Cargo Handling Simulator-based training of marine industry and sea-going personnel in liquid cargo handling;
- oil spill effects and response procedures analysis;
- marine operational risk assessment and analysis.

The group is also involved in:

- development of tanker cargo operations training and safety procedures;
- introduction of LNG marine dual-fuel diesel engines;
- essential support for LNG as implementation of dual-fuel bunkering infrastructure.

The group's research capacity is being expanded by acquisition of new infrastructure for comprehensive risk analysis. When fully operational, the infrastructure will consist of:

- 3D technical modelling tools with materials database (CAD/CAM/CAE);
- Finished Element Method-based (implicit and explicit Nastran Solvers) structural analysis tools;
- statistical tools for Reliability, Availability and Maintainability (RAM) analysis;
- tools for examination and risk assessment of potential incidents from the initial release to far-field dispersion, including modelling of pool spreading and evaporation, and flammable and toxic effects resulting from industrial hazards;
- tools for ship traffic analysis;
- tools for analysis of ships' accidents and incidents (case study approach);
- tools for analysis of shipping routes.

The expertise offered and co-operation areas sought include:

- liquid cargo handling (training, process analysis, safety procedures);
- oil spill research (oil spill modelling, SAR action planning, coast pollution probability assessment, oil spill combat methods);
- LNG Dual-Fuel (bunkering, efficiency);
- risk analysis;
- GIS-based analysis;
- AIS and ships' traffic analysis.

Keywords describing the expertise offered:
LNG, LCHS, oil spill, risk analysis, Dual-Fuel, FEM, tankers, traffic analysis, ships' routes safety analysis, restricted water area analysis, ships' accidents and incidents, case study

Transport

Maritime University of Szczecin
ul. Henryka Pobożnego 11
70-507 Szczecin
Poland
www.am.szczecin.pl

Stanisław Iwan, Prof. AM, Ph.D., D.Sc.

Faculty of Economics and Transport Engineering
Department of Logistics and Transportation Systems
e-mail: s.iwan@am.szczecin.pl
phone: +48 91 480 96 75
mobile: +48 603 259 695

Research in the area of: logistics management, city logistics, transport telematics, logistics telematics, application of artificial intelligence in transport and logistics, application of simulation tools in transport and logistics.

Experience in projects:

- project C-LIEGE (Clean Last Mile Transport and Logistics Management for Smart and Efficient Local Governments in Europe), funded under the Intelligent Energy-Europe programme;
- project „The study and modelling of integrated transportation system for West Pomeranian Region with particular emphasis on Central European Transport Corridor North-South", funded by The National Centre for Research and Development in 2009-2011;
- leader of international project GRASS (GReen And Sustainable freight transport Systems in cities), founded by Norwegian Grants (Norwegian Financial Mechanism 2009-2014 – Polish-Norwegian Research Programme);
- project "Analysis of information needs of heterogeneous environment in sustainable urban freight", financed by the Polish National Science Centre;
- project NOVELOG (New cooperative business models and guidance for sustainable city logistics), funded by the EU Horizon 2020 programme (Call H2020-MG-2014/2015, Topic MG.5.2-2014).

The team has two mobile traffic detectors which can be used for analysing the traffic with a due consideration to vehicle types.

Offered expertise:

Application of telematics systems in logistics and transport systems; development of intelligent transport systems; development of city logistics systems; optimization of urban freight transport; optimization of transport and logistics; development of intelligent systems in city logistics; implementation of information society solutions In transport systems; analysis of the city in terms of transport systems functioning.

Keywords specifying the offered expertise:

transport and logistics systems, city logistics, urban freight transport, transport systems telematics, intelligent transportation systems, artificial intelligence

Maritime University of Szczecin
ul. Wały Chrobrego 1-2
70-500 Szczecin
Poland
www.am.szczecin.pl

Professor Tadeusz Szelangiewicz, Ph.D., D.Sc., Eng.

Faculty of Navigation
Chair of Ocean Engineering and Naval Architecture
e-mail: t.szelangiewicz@am.szczecin.pl
phone: +48 91 480 93 52

Computer analysis, optimization and preliminary design of ships and yachts:

- ship design parameters' optimization at the preliminary stage of design;
- ship's power analysis and service speed prediction under statistical weather conditions for a set of shipping routes;
- application of CFD methods to computer modelling and body lines optimization to increase the propulsive efficiency and to minimize fuel consumption and EEDI indicator;
- application of CFD methods to analysis of the ship resistance;
- application of CFD methods to propeller design and optimization;
- intact and damage stability calculations, seakeeping and manoeuvrability;
- application of CFD methods to computer-aided modelling of body lines of sailing and motor yachts;
- ballast water management at sea.

Offshore units:

- analysis of seakeeping and intact stability of offshore units;
- design of mooring and dynamic positioning systems of floating units;
- design of systems for lifting minerals (e.g. polymetallic nodules) from the seabed;
- design of propulsion systems for motion control of floating units.

Offered expertise:

- optimization of cargo ship design parameters at the preliminary stage of design;
- prediction of the service speed of cargo ships under statistical weather conditions for a set of shipping routes;
- computer aided modelling and optimization of body lines and the propeller to minimize the resistance (minimizing fuel consumption, engine emissions, the EEDI indicator);
- application of CFD methods to the design of ships, yachts and offshore units;
- design of mooring and dynamic positioning systems and precise motion control of floating units.

Keywords specifying the offered expertise:
preliminary design of cargo ships, yachts, prediction of service speed, optimization, minimization of fuel consumption, EEDI indicator, efficiency hull, propeller, CFD methods

Transport

Maritime University of Szczecin
ul. Wały Chrobrego 1-2
70-500 Szczecin
Poland
www.am.szczecin.pl/en

Zofia Jóźwiak, Prof. AM, Ph.D., D.Sc., Eng.

Bogusz Wiśnicki, Ph.D., Eng.

Department of Integrated Transport Technologies and Environmental Science
e-mail: z.jozwiak@am.szczecin.pl, e-mail: b.wisnicki@am.szczecin.pl
phone: +48 91 480 96 40
mobile: +48 725 661 066

Department of Integrated Transport Technologies and Environmental Science is a young but fast-growing unit in the Faculty of Transport Engineering and Economics.

The department has expertise in the following fields of study:

- environmental studies;
- laboratory research on water and wastewater pollution and working conditions;
- environmental protection of the sea and ports (ballast water management, ship wastes, oil spills);
- transport economics (market analysis, feasibility studies, efficiency analysis);
- logistics (supply chain optimization, innovative logistic services, development of logistics centres);
- transport technologies (intermodal transport, intermodal terminals, port terminals, transhipment technologies, cargo handling, cargo stowing and securing);
- transport management (intermodal transport connections, terminal operational systems, sea shipping, inland shipping, fleet management);
- transport policy (sustainable transport, transport corridors, blue growth).

The Department was involved in international research projects funded by the EU 6th Framework Programme, Interreg Programmes (Baltic Sea Region, South Baltic, Central Europe), and Swedish Institute Grants. In addition to international and national funding, the Department successfully completed a large number of commissioned projects for the private sector. The research and development projects carried out at the Department involve a multicriterial (i.e. technological, economic and environmental) approach, essential for complex transport projects. The research employs up-to-date methodology. Numerous projects involve the use of IT tools for transport process modelling and logistics chain optimisation.

Offered expertise:

- environmental impact assessment;
- environmental laboratory tests (water, noise, light, electromagnetic radiation, air movement);
- transport market analysis and prediction;
- analysis of investment needs (ports, terminals, transport corridors);
- feasibility Studies for infrastructure and equipment projects;
- analysis of the efficiency of transport systems and processes;
- development and implementation of logistic functions;
- transport system and process modelling;
- development of decision-making tools and support systems for transport operators and policy-makers;
- implementations and development of innovative transport technologies (intermodal and unimodal);
- optimization of supply chains (global, regional);
- research support for in-house logistics and production logistics.

Keywords specifying the offered expertise:
environmental engineering, protection of the sea environment, transport economics, logistics, transport technologies, intermodal transport, ports, supply chain logistics, transport modelling, sustainable development

Marine Technology Ltd
ul. Klonowica 37/5
71-248 Szczecin
Poland
www.marinetechnology.pl

Andrzej Stateczny
CEO
e-mail: a.stateczny@marinetechnology.pl
phone: +48 91 831 09 35
mobile: +48 609 568 961

Marine Technology Ltd is a research-oriented non-profit spin-out company. The main activities of the company are research and development in engineering. The company cooperates with a large group of experts in navigation, hydrography, geoinformatics, geodesy and cartography, IT and others.
Marine Technology has wide research and practical experience in sensors technology, River Information Services, navigation sensor planning, port planning and surveys as well as geoinformatics systems and hydrographic measurements. In addition, the company is capable of providing ergonomic design of graphical user interfaces and has many years of experience in research on electronic maps, including experience gained during the development of the Inland Electronic Navigational Chart (IENC) for the River Information System (RIS) for the Lower Odra. Marine Technology has the headquarters and two branches.

It has 3 modern research laboratories including an ESRI and CARIS software:
- Geoinformatics laboratory;
- Electronic Navigation Charts laboratory;
- Inland Mobil Navigation laboratory.

Offered expertise:
The range of topics of interest covers geoinformatics and topics related to IT systems.
It is planned to intensify research activities, with a particular focus on navigation data integration, in an attempt to develop the so-called Intelligent Navigation Bridge. These works could provide a solid ground for the future introduction of an Intelligent Autonomous Surface Vehicle.

Keywords specifying the offered expertise:
Radar technology, Navigation sensor planning, River Information Services (RIS) geoinformatics systems, Port planning, Port surveys, Port charting

Transport

OT LOGISTICS S.A.
ul. Zbożowa 4
70-653 Szczecin
Poland
www.otlogistics.com.pl

Marcin Olewnik

Management Board Representative for OT Logistics Group Integration
e-mail: marcin.olewnik@otlogistics.com.pl
mobile: +48 605 889 393

OT Logistics Group is a Polish company with over 70 years of experience. It is the largest port operator in Poland and the southern Baltic and a leader in inland waterway transport from Kaliningrad, Russia to ports in Germany and the Netherlands. The Group comprises companies specialised in road, rail shipping, forwarding and logistics. OT Logistics S.A., our leading company, is also the largest industry shareholder in the seaport of Luka Rijeka in Croatia. The OT Logistics Group comprises more than 20 companies providing freight, sea, rail, road and air forwarding services, cargo handling in ports and inland terminals as well as inland waterway transport. We are the largest and the most versatile port operator in Poland and one of the largest on the southern coast of the Baltic Sea in handling dry bulk cargo and general cargo.

OT Logistics is also a leader in inland waterway transport in Central Europe, and one of the major players on the market of inland waterway transport in the European Union. We have a dominant position in Poland and a very strong position on the East Germany's market. We handle long-term contracts for the shipment of coal and oversize cargo. Apart from bulk cargo, an important part of our business is the transport of containers. We achieved the strongest position in this segment on the lines between the port of Hamburg and inland ports in central and southern Germany.

With the help of our multi-modal forwarders, OT Group Logistics can provide forwarding services of any goods, no matter how specialised. We have been involved in hydraulic engineering works for many years, taking part in the most challenging projects.

Since 2013, OT Logistics S.A. have been a public company listed on the Warsaw Stock Exchange. Our main shareholders are pension funds (Met Life, Allianz) and the Polish I Fundusz Mistral S.A. Our main strengths are a comprehensive portfolio, decades of experience and specialisation of the individual companies of the Group.

Offered expertise:

- we offer our customers state-of-the-art and innovative solutions at every stage of the logistics chain. Our services come from a comprehensive and versatile portfolio. Therefore we can offer our customers comprehensive one-stop-shop logistic solutions, ranging from organising sea freight to handling in ports to the final delivery to the customer;
- we provide comprehensive services to Polish and international markets in sea freight, road, rail, air, multimodal forwarding, forwarding services for fair and general cargo lines. We offer warehousing services, transport support and customs agency services. We handle bulk, general cargo, containerised, special and oversize loads. Thanks to the complex structure of the OT Logistics Group, we provide complete handling of freight, ranging from the organisation of shipment to storage and distribution of goods;
- our company offers also hydraulic engineering works support using our own floating equipment, delivery of all building materials and removal of overburden as well as dredging works. We offer both the wealth of experience and specialised equipment.

Keywords specifying the offered expertise:

inland waterway transport; freight forwarding (sea, road, rail, air); port operator; handling of bulk, general and oversize cargo; transport of special and dangerous cargo; hydraulic engineering works

Sup4Nav LLC

Sup4Nav LLC
ul. Niemierzyńska 17a
71-441 Szczecin
Poland
www.navdec.eu

Piotr Wołejsza
R&D
e-mail: piotr@sup4nav.com
phone: +48 91 449 45 49
mobile: +48 730 040 021

Sup4Nav is a young high-tech company operating in the maritime sector. Its R&D Department cooperates with researchers and experts representing different scientific fields: navigation, geodesy, computer sciences, automation and control, IT, ICT as well as navigation officers including master mariners. The team members are inventors and authors of patent application (European Patent Office) for A method and system of navigational decision support in the process of safe vessel navigation. The brand product of the company is NAVDEC – the first navigational tool worldwide that performs information functions as well as those typical of decision support systems; the prototype was developed at the Maritime University of Szczecin. Its innovative functionalities, significantly extending the performance of devices generally carried by ships, have now a status of patent applications filed internationally. The system is already installed on several merchant vessels operating worldwide. The team members are consistently working on new functionalities of NAVDEC and other navigational systems on-board and ashore for both manned and unmanned ships including autonomous vehicles. A higher level of navigational safety gained through the introduction of the system performing the new functionalities will reduce the risk of marine accidents.

This will bring the following advantages:

- social benefits due to lower rate of personnel injuries and loss of life on sea-going ships;
- material benefits due to lower loss of cargo, less damage to ships or sinkings;
- marine environment protection and prevention of environmental disasters that occur as a consequence of collision of ships carrying dangerous goods.

Offered expertise:

- decision support for manned and unmanned vessels incl. autonomous vehicles;
- navigation control system for autonomous vessel;
- analysis and assessment of navigational situations based on simulations performed using real data and modern computer technologies;
- navigation-related decision support in collision situations – shipboard decision support system installed on the navigation bridge of:
  - merchant vessels (sea-going and inland shipping);
  - leisure boats (e.g. sailing ships, motor yachts);
- navigational decision support in collision situations – a component of land-based vessel traffic services systems (VTS, VTMS, VTMIS, RIS);
- analysis and assessment of marine accidents at sea and on inland waterways – a system intended for experts working for maritime courts.

The company offers design and construction of computer systems supporting decision making processes and actions taken by navigators on board ships and at land-based centres. The main areas, among others, are: 1) automatic navigational data acquisition and distribution; 2) analysis of navigational information and generation of solutions to collision situations accounting for the Collision Regulations and good sea practices; 3) communication, co-operation and co-ordination of actions with other ships and land-based centres responsible for vessel traffic management (VTS and others); 4) interaction with a navigator supervising the system.

Keywords specifying the offered expertise:
water transport, autonomous vehicle, ICT, safety of navigation, decision support systems, artificial intelligence, COLREGs, collision avoidance

Transport

8

Socio-economic Sciences

University of Szczecin
ul. Mickiewicza 64
71-101 Szczecin
Poland
www.wneiz.pl/en

Jacek Batóg, Prof. US, Ph.D., D.Sc.

Institute of Econometrics and Statistics
e-mail: jacek.batog@usz.edu.pl
phone: +48 91 444 21 21; +48 91 444 19 04
mobile: +48 503 704 537

The Institute of Econometrics and Statistics (IES) conducts research associated with application of quantitative methods in economics. The key issues are:

- effectiveness of management processes in the enterprise;
- econometric and statistical methods in the analysis, diagnosis and prognosis of economic phenomena;
- operational research;
- gender studies in economics;
- real estate management (management, brokerage, valuation);
- classification of socio-economic objects;
- analysis of labour market;
- monitoring and evaluation of development strategies.

The IES staff consists of 10 professors and 15 Ph.D.s who carry out their research supported by the University as well as by national and international research projects. For more than 30 years, IES has been active in organising conferences in the areas of interest; for almost 20 years, DES has conducted postgraduate studies in real estate management.

The expertise offered includes:

- various forms of market research;
- business valuation;
- real estate valuation;
- economic and demographic analyses, diagnoses and forecasts;
- research related to valuation of informal women's jobs;
- foresight and benchmarking;
- trademark valuation;
- feasibilitiy studies.

Keywords specifying the offered expertise:
quantitative methods, econometrics, statistics, business valuation, real estate valuation, gender study, demographics, operational research

University of Szczecin
ul. Mickiewicza 64
71-101 Szczecin
Poland
www.wneiz.pl/en

Dr Anna Katoła

Faculty of Economics and Management
Department of Socio-Economic Policy and European Regional Studies
e-mail: anna.katola@interia.eu
phone: +48 91 444 19 84

The Department of Socio-Economic Policy and European Regional Studies (DSEPERS) pursues research in economics related to both traditional problems as well as new and current topics that are tackled as they arise and as knowledge progresses. The research, stemming from scientific interests of individual scientists, is underpinned by needs and expectations of regional and national economic policies. The major areas of interest include:

- the role of the state in economy;
- social policy;
- quality of life;
- sustainable development on the regional and local level;
- local and regional developments in social activity stimulation and labour market;
- identification and analysis of socio-economic factors influencing the development, innovation and competitiveness of regions and local communities, with a particular reference to rural areas;
- corporate social responsibility (CSR);
- the use of EU funds;
- environmental policy, awareness, and education;
- the role of local governments in the development of regions and local communities;
- environmental management and economics;
- region-scale water management;
- economic cooperation in the Baltic Sea region;
- economic cooperation in border region;
- multifunctional development of rural areas.

The expertise offered includes:

- development of strategic documents pertaining to local development;
- working out sustainable development strategy documents;
- research on labour market, including discrimination against employees;
- research on quality of life;
- implementation of sustainable development;
- development of strategies for Local Action Groups;
- research related to entrepreneurship in problem areas e.g. groups threatened by social exclusion and already excluded;
- CSR as well as on pertaining to development of social economy and social capital;
- development of training programs in environmental education and sustainable development.

Keywords describing the expertise offered:
sustainable development, strategic documents, CSR, social economy

Socio-economic Sciences

West Pomeranian University of Technology, Szczecin
ul. Żołnierska 47
71-210 Szczecin, Poland
www.zut.edu.pl

Professor Irena Łącka, Ph.D., D.Sc., Eng.

Bioservice Innovative Centre for Analysis and Implementation
e-mail: irena.lacka@zut.edu.pl
phone: +48 91 449 69 90

The Bioservice Innovative Centre for Analysis and Implementation gathers an interdisciplinary group of specialists providing support services to entrepreneurs and scientists and focused on R&D and bioeconomic applications. The Bioservice facilitates and provides:

- transfer of scientific knowledge to economy;
- access to the most recent scientific knowledge and information on bioeconomy sectors and to information on businesses' needs technological solutions;
- contacts between scientists and entrepreneurs;
- support with respect to analyses of effectiveness of innovative investment and its commercialisation potential.

The Bioservice has:

- an experienced staff conducting long-term research on economic and organizational issues with respect to broadly defined bioeconomy and innovation, transfer of knowledge and technology;
- staff knowledgeable in innovative management of R&D systems in scientific units and in innovation enhancement;
- experts in substantive, technical, economic and financial assessment of innovative projects.

The expertise offered includes:

- collection and processing of information about the supply of and demand for technological developments in bioeconomy;
- staff training for innovative enterprises in the bioeconomy sector;
- transfer of knowledge in bioeconomy between scientists and businesses and knowledge commercialisation;
- assessment of economic effectiveness of investments, product and process solutions in bioeconomy;
- assessment of the potential and methods of commercialising innovation;
- professional opinion and consultancy on food economy and agribusiness;
- access to accommodation facilities and IT infrastructure for research projects.

The Bioservice seeks cooperation in:

- market research;
- analysis of market determinants for new products and services;
- examination of buyer's expectations in relation to new product groups and their prices;
- determination of economic effectiveness of new product groups;
- assessment of potential for commercialisation of new solutions;
- assessment of effectiveness and risk in entrepreneurship;
- analysis of cluster relationships within bioeconomy;
- analysis of competitiveness of economic entities;
- analysis of development potential of Polish food industry and other components of agribusiness.

Keywords describing the expertise offered:
transfer and commercialisation of knowledge, bioeconomy, science-industry co-operation, innovations, effectiveness, risk management

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology, Szczecin
ul. Żołnierska 47
71-210 Szczecin
Poland
www.ekonomia.zut.edu.pl

Professor Irena Łącka, Ph.D., D.Sc., Eng.

Department of Economics and Accounting
e-mail: irena.lacka@zut.edu.pl
phone: +48 91 449 69 91

The Department of Economics and Accounting (DEA) groups 11 scientists, including 2 senior academic staff members and 8 Ph.Ds and 1 M.Sc. working on technological partnerships of economic entities, science-industry relationships, determinants of innovativeness in economy and food industry, transfer of knowledge and commercialisation of technology, challenges of knowledge-based economy, problems of sustainable economic development, economic aspects of economic decision-making, risk management, importance of human and social capital and technology for economic growth and development, the role of integrated IT systems in evolution of modern organisation management, and human resources management, accounting in territorial self-government units, accounting and management control in public finances units, ecological aspects of accounting, economic analysis, financial analysis, accounting for corporate social responsibility.

The DEA scientists prepare professional opinions with respect to:

- implementation of integrated IT ERP-class systems;
- effectiveness of acquired EU funds;
- assessment of development strategies of cities and municipalities;
- cluster relationships and strategic alliances;
- functioning of large agribusiness enterprises and broadly defined bioeconomy;
- development potential of the Polish food industry;
- economic and financial assessment in economic and financial analysis of projects;
- substantive and technical assessment in direct investment support for the SME sector;
- financial and economic analysis;
- assessment of financial situation of enterprises.

The expertise offered includes:

- research and analytical services with respect to functional projects for implementation of IT ERP-class systems, effectiveness of acquired EU funds, formulation and revision of development programmes concerning social capital, examination of forms and results of co-operation between science sector institutions and enterprises, analysis of the effectiveness of strategic alliances, developing studies on potential technology transfer between R&D sector institutions and industry, development and implementation of periodic staff evaluation system, and analysis of training needs in business;
- evaluation of science-industry relationships, effectiveness, strategic alliances, transfer and commercialisation of technology;
- economic, financial, substantive and technical analyses with regard to innovations, SME development and competitiveness, and regional development strategies;
- assessment of financial standing of enterprises;
- accounting and management control in public finances units.

Keywords specifying the offered expertise:

economics, knowledge-based economy, technology transfer, science-business cooperation, IT systems, agribusiness, accounting, economic and financial analysis

Socio-economic Sciences

University of Szczecin
ul. Mickiewicza 64
71-101 Szczecin
Poland
www.wneiz.pl/en

Professor Iga Rudawska, D.Sc.

Faculty of Economics and Management
Department of Health Economics
e-mail: igita@wneiz.pl
phone: +48 91 444 20 81

The Department of Health Economics (DHE) groups specialists working on:

- market mechanisms in healthcare;
- healthcare systems performance;
- public health;
- healthcare organization performance;
- healthcare services marketing;
- healthcare quality;
- patient consumption patterns and behaviours;
- patient-provider relationships.

DHE is also interested in problems of the service sector, public management, and relationship marketing.
DHE has been active in organizing international conferences on Health Economics (6 series of the Baltic Health Forum), cooperation with businesses from healthcare sector, developing scientific projects financed by the National Science Center in Poland, and conducting qualitative and quantitative studies on healthcare, also in international settings.
DHE is involved in many international and national projects and cooperates with various academic institutions in Poland and abroad.

DHE offers expertise and seeks cooperation in:

- conducting qualitative and quantitative studies in international scientific networks;
- preparing consumer (patient) profiles based on primary and secondary data;
- developing indicators with which to measure performance of healthcare organizations and systems;
- conducting international comparative studies on public health, patient behaviour and healthcare organization performance;
- researching marketing activities of healthcare organizations;
- managing patient-provider relationships in healthcare settings;
- managing other relationships (payer-provider, doctor-organization) in the healthcare sector.

Keywords describing the expertise offered:
healthcare economics, healthcare management, performance measurement, patient behavior, relationship management, service marketing

University of Szczecin
Faculty of Management and Economics of Services
ul. Cukrowa 8
71-004 Szczecin
Poland
www.wzieu.pl
www.serviceinterlab.pl

Professor Beata Świecka, Ph.D., D.Sc.

Household and Behavioural Finance Centre
e-mail: beata.swiecka@wzieu.pl
phone: +48 91 444 31 73

The Household and Behavioural Finance Centre (CeFOB) groups experts specialising in social research across all areas of personal finances. CeFOB's research is primarily focused on:

- households finances;
- family finances;
- behavioural finances;
- personal finance management;
- household over-indebtedness and insolvency;
- financial education;
- cashless society;
- electronic banking;
- quantitative analysis in personal finances.

The expertise offered is associated with cooperation sought in:

- participation in projects;
- research on personal and behavioural finances;
- development of programmes and tools with which to teach personal and behavioural finances at different levels as well as educational actions (courses, training, seminars);
- popularising personal finance knowledge through e.g. websites, articles in scientific journals and popular science magazines, conferences, seminars, courses;
- first-, second-, and third-level university education (bachelor's, master's and doctoral theses) and postdoctoral research in personal and behavioural finances.

Keywords describing the expertise offered:
personal finances, behavioural finances, households, socio-economics

Academy of Art in Szczecin
pl. Orła Białego 2
70-562 Szczecin
Poland
www.akademiasztuki.eu

Dr Aleksandra Łukaszewicz Alcaraz

Department of Painting and New Media
e-mail: aleksandra.lukaszewicz.alcaraz@akademiasztuki.eu
mobile: +48 726 188 421

The Department of Painting and New Media has a professional and visionary staff involved in art, media, design, history, and theory of art and aesthetics. It combines different genres of traditional and contemporary art and design, supported by deep theoretical insights from the point of view of critical theory in philosophy, sociology, and economics. The research activities focus mainly on:

- graphics and new media (photography, animation, experimental film, multimedia);
- design (innovative product design, fashion design, visual communication);
- painting (an interdisciplinary research program);
- cultural, economic, political, and social underpinnings of art.

Additionally, the Department is interested in research on: phenomenology of image, visual culture, marketing, and protection of intellectual property; formal and aesthetical investigation of modern media, art, and design. The Department is involved in many international and national projects and has experience in the development of innovative and friendly solutions which can be implemented in industry. Understanding the importance of creative industries, the Department, cooperates with various external stakeholders, including the Adobe Systems Incorporated, Polish Institute in Stockholm, Cluster of Creative Industries in Szczecin, Kunstbauwerk Tabakfabrik Vierraden (Germany), and the National Museum in Szczecin.

Department has expertise in:

- analysis and development of experimental film and animation, video art, installation, art in public spaces, performative artistic activities, experimental music, post-production of image and sound, multimedia publication design; visual identification, signage, commercials, publications, artistic books, lettering and typography, mobile applications and packages;
- modelling and prototyping, 3D modelling, laser cutting;
- the use of traditional media, new media, and post-media in current artistic work of painters;
- current and historical analysis in philosophy, theory of art, aesthetics, sociology of art –from an economic, political, and social vantage of art, visual communication, and iconosphere.

The Department has well-equipped modern lecture halls; photographic, film, and recording studios; computer labs; drawing and painting ateliers; sewing, shoemaking, and goldsmith's workshops, serigraphy studio; modelling workshop for wood, metal, plastics, and ceramics; and rental of computer, photographic, film, and recording equipment.

The infrastructure of the Department enables high quality research meeting the Polish and European standards.

Keywords specifying the offered expertise:

media, new media, post-media, experimental film, product design, fashion design, visual communication, visual identification, multimedia publications, critical theory, aesthetics, sociology of art, and economy of art

University of Szczecin
ul. Mickiewicza 64
71-101 Szczecin, Poland
www.mikroekonomia.net

Professor Tomasz Bernat

Faculty of Economics and Management, Institute of Economics
Microeconomics Department
e-mail: tomasz.bernat@usz.edu.pl
phone: +48 91 444 20 93

All the research activities of the Microeconomics Department are related to the following subjects: entrepreneurship and labour market, market structure and concentration, economic analysis of enterprises, sustainability of economy and entities, CSR. The activities have resulted in publication of about 100 monographs and over 500 articles in both international and Polish journals. In addition, the Department staff has organized over 50 national and international scientific conferences. The department is headed by Prof. Tomasz Bernat who has an experience in EU Framework Programmes. He published more than 130 papers in high-rank journals. He received 9 prestigious grants from the Polish Ministry of Higher Education and Science as well as 15 awards.

The Microeconomics Department has coordinated project PRORES funded by FP7-PEOPLE-2010-IRSES (Project ID: 269251) and the Lama project funded by FP6-2002-MOBILITY-3 (Project ID: 14356). In addition, the Department has successfully participated/coordinated EU projects within the frameworks of Interreg III as well as projects funded by the European Integration Committee Cooperation Fund, the State Committee for Scientific Research and the National Bank of Poland.

The Department offers expertise and seeks cooperation in the following areas:

- entrepreneurship at different level of school systems in Poland and selected European countries;
- entrepreneurship in academic spin-off;
- geno-economical determinants of individual entrepreneurship;
- economic impacts of immigration and emigration;
- economics and social consequences of market monopoly;
- developing indicators with which to measure performance of restructuring companies;
- analysis of environmental aspects in companies;
- analyses of public-private partnership;
- analyses, diagnoses, prognoses and strategies in and for education.

Keywords specifying the offered expertise:
entrepreneurship and labour market, academic spin-off, migration studies, market structure and concentration, economics analysis of enterprises, restructuring of companies, public-private partnership, sustainability of economy and entities, CSR.

University of Szczecin
ul. Mickiewicza 64
71-101 Szczecin, Poland
www.iiwz.wneiz.pl

Professor Waldemar Wolski, Ph.D.

Luiza Fabisiak, Ph.D., Eng.

Michał Nowakowski, Ph.D.

Faculty of Economics and Management, Institute of IT in Management,
Department of IT Systems Engineering, Unit of Internet Systems
e-mail: wwolski@wneiz.pl, luiza.fabisiak@wneiz.pl, michal.nowakowski@wneiz.pl
phone: +48 91 444 19 08, +48 91 444 19 95, +48 91 444 19 41

The Unit of Internet Systems (UIS) is an interdisciplinary group of specialists focused on the following research topics:

- analysis and quality evaluation of internet services and portals (informative and business);
- analysis and usability evaluation of internet services;
- analysis and functionality evaluation of internet services;
- analysis and accessibility evaluation of internet services;
- analysis and evaluation of internet services information architecture;
- methods for evaluating the quality of internet services;
- research on and exploration of website users' preferences;
- research on website users' behaviour;
- monitoring and analysis of website users' behaviour;
- methods for evaluating users' behaviour;
- developing websites using CMS systems and dynamic programming languages;
- presentation and visualization of information.

UIS research infrastructure includes modern and well-equipped laboratories. The group takes part in national projects and has experience that can be used in industrial applications.

UIS offers the following services:

- analysis and quality evaluation of internet services and applications;
- analysis and usability evaluation of internet services and portals;
- analysis and accessibility evaluation of internet services and portals;
- analysis and evaluation of information architecture of internet services and portals;
- analysis and evaluation of website users' behaviour using advanced methods (group interviews, expert evaluation, heuristic evaluation, A/B tests, analysis of website statistics, eye-tracking research, etc.);
- modeling users' behaviour according to HCI (Human Computer Interaction);
- monitoring and exploration of website users' preferences;
- improvement of website customer retention;
- identification of website user profiles;
- design and development of websites according to ISO quality guidelines;
- trainings in website analysis and quality evaluation using quantitative and qualitative methods.

Keywords specifying the offered expertise:
internet services and applications, business portal, quality evaluation, usability, functionality, accessibility, information architecture, users' preferences, analysis of users' behaviour

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology, Szczecin
ul. Klemensa Janickiego 31
71-270 Szczecin
Poland
www.ekonomia.zut.edu.pl

Professor Michał Świtłyk, Ph.D., D.Sc.

Department of Management
e-mail: kzp@zut.edu.pl
phone: +48 91 449 68 71

The Department of Management conducts comprehensive research in two key areas:

Farm economics, with a particular emphasis on:

- the impact of changes in external factors (i.e. changes in agricultural policy) on the output and economic situation (mainly with respect to dairy farms);
- comparisons of farm strategies (i.e. changes in crop rotation, increase in land resources, farm expansion or reduction, change in the production profile, etc.);
- analysis of cost-effectiveness of agricultural production in different farm types;
- changes in farm risk level and risk management methods;
- analysis of farm efficiency and productivity in the region, country and at international level.

Business entities, to the extent of:

- efficiency analysis of DEA method;
- application of Organizational Network Analysis (ONA) to the management sciences;
- innovation management at regional level as well as in scientific and commercial entities;
- strategic management in enterprises (especially SMEs).

The Department of Management has experience as a contractor in research under the Framework Programmes.

Offered expertise:

- estimating production costs and cost-effectiveness of agricultural production including: generation of calculation models and calculation of cattle breeding plant and farm costs, with a particular reference to costs of milk production;
- evaluation of the impact of changes in the factors in the external environment and internal of farms to economic performance (creating scenarios of changes in agricultural policy and the strategy of households);
- the risk assessment income of farms and the efficiency of the use of risk management tools in agriculture;
- measuring productivity and effectiveness of management of business organization and administrative units in cross-panel data section at the municipality, state and international level;
- organizational Network Analysis (ONA)-based research on inter-organizational relations;
- strategic analyses of organizations and regions, including development of general, marketing or innovation strategies;
- assessment of commercialization potential for product innovations;
- assessment of management systems-oriented innovation activities.

Keywords specifying the offered expertise:
farm cost-effectiveness, policy scenario, farm strategy, effectiveness, risk analysis, organizational networks, strategic analysis, commercialization of product innovations, management systems-oriented innovation activities

Socio-economic Sciences

9

Architecture

West Pomeranian University of Technology, Szczecin
ul. Żołnierska 50
71-210 Szczecin
Poland
www.wbia.zut.edu.pl

Professor Zbigniew Paszkowski, Ph.D., D.Sc., Eng., Architect

Faculty of Civil Engineering and Architecture
Department of Theory and History of Architecture and Monument Conservation, Institute of Architecture and Spatial Planning
e-mail: zbigniew.paszkowski@gmail.com
phone: +48 91 449 42 21
mobile: +48 601 704 454

The Department of Theory and History of Architecture and Monument Conservation (DHAMC) groups specialists working primarily on:

- innovative thinking in adaptation and conservation of the build-up heritage;
- revitalization and modernization of historic cities;
- analyses and survey of historic architecture and urban complexes with modern means of presentation (CAD drawings, virtual 3D modelling);
- architectural and urban design in historic context (infills, reconstructions, renovations);
- transformation of post-industrial sites, focused on waterfront areas and the use of renewable energy sources.

DHAMC focuses mainly on planning and programming in architecture and investments in historic context, planning of public spaces in historic environments, adaptation and modernization of historic buildings and structures, analyses and re-use of historic sites (with a special focus on fortifications), planning of waterfront areas in cities, planning of post-industrial areas transformation, planning of constructions with renewable energy sources, historical research, strengthening of endangered buildings.
DTHAMC employs 10 specialists in monument conservation and architectural design, and co-operates with local and outside specialists. The DTHAMC knowledge base enhances a variety of tasks related to built-up environments, materials, techniques, arts and crafts, surveys of buildings and their components made of stone, timber, and bricks.
The DTHAMC research infrastructure includes CAD-laboratories, modern survey equipment, and appropriate software.

The expertise offered includes:

- research on history of architecture and urban planning;
- application of advanced contemporary methods of building survey;
- technical advice and consulting on historic buildings and their components;
- programming, new and adaptive planning in architectural design;
- co-ordination of investment processes in built-up areas;
- revitalization of worn-out districts and complexes.

Keywords specifying the offered expertise:
modernization, planning, architecture, urban planning, monument conservation, building survey, post-industrial planning, historical research

West Pomeranian University of Technology Szczecin

West Pomeranian University of Technology, Szczecin
ul. Żołnierska 50
71-210 Szczecin
Poland
www.urban.zut.edu.pl

Dr Adam Zwoliński, Eng., Architect

Faculty of Civil Engineering and Architecture
Cyber Urban Center
e-mail: urban@zut.edu.pl
phone: +48 91 449 56 79, +48 91 449 56 74
mobile: +48 609 740 200

The Cyber Urban Centre (CUC) groups scientists interested in application of computational techniques in urban design, spatial planning and architecture. In view of the extremely dynamic progress and development in 3D modelling, visualization of urban landscape and GIS, geo-information technology is developed which, within the next decades will lead to the availability of 3D city models on country-wide and supranational scales. The 3D-city-models might be a future tool for complex urban analysis of built-up environments, important for urban planning & design. The CUC mission is to expand scientific activities and to create an interdisciplinary cooperation network within the research area of 3D Advanced Urban Analysis Systems. The CUC potential derives from the traditions, experience and strengths of the West Pomeranian University of Technology in Szczecin as an important Polish centre with a multidisciplinary structure and significant experience in managing academic and intersectoral cooperation and partnerships, evidences by numerous national and European research programs (including the 7th Framework Program).

The CUC founders: Professor Waldemar Marzęcki, Drs Klara Czyńska, Paweł Rubinowicz and Adam Zwoliński have scientific and professional competences in architecture, urban design, digital simulations for spatial impact of tall buildings location, analyses of public spaces and qualitative parametric valuation of urban structures. CUC members are experienced in cooperating in national (about 6 projects implemented successfully in 2003-2013) and European research programs. Currently, CUC leads a project (2TaLL), to be carried out in 2013-2015, with support from the Polish-Norwegian Research Programme. The CUC team has already completed pioneer implementations of 3D analyses for several cities in Poland. The methods developed were applied to professional planning studies based on contracts with local governments and contributed to the development of their strategies or master plans.

The expertise offered coincides with areas in which scientific and intersectoral cooperation is sought at the European and global levels.
Specifically, the CUC expertise covers:

- information science and engineering: urban engineering, architecture, computational engineering, computer aided design, smart cities and related aspects of computer sciences incl. numerical analysis, simulation & optimization, graphics & image analysis;
- environment and geosciences: urbanization and urban planning, spatial and regional planning, geographical information systems, environment and sustainability, mobility and transportation, and others;
- selected aspects of other disciplines: economics sciences (urban and regional economics), social sciences and humanities (cultural heritage), mathematics (geometry, scientific computing, algorithms and complexity);

and involves:

- competence in the field of theory and practice of urban design and architecture;
- competence in application of 3D city models in urban and spatial planning;
- new methods of advanced urban analysis and related unique software solutions;

as well as specialist research areas (ongoing CUC research topics):

- computer simulations of spatial impacts of tall buildings;
- geometrical parameterization of public spaces in cities;
- numerical and algorithmic interpretation of urban fabric;
- cities complexity and related fractal dimension analysis.

Keywords specifying the offered expertise:
advanced urban analysis, spatial planning, urban design, architecture, 3D city models, urban computation, computer simulation, interactive 3D city visualization, public spaces, sustainable development, protection of historical panoramas, cultural heritage

Architecture

West Pomeranian University of Technology, Szczecin
ul. Słowackiego 17
71-434 Szczecin
Poland
www.kpk.zut.edu.pl

Dr Magdalena Rzeszotarska-Pałka, Eng., Architect

Faculty of Environmental Management and Agriculture
Department of Landscape Design
e-mail: mrzeszotarskapalka@zut.edu.pl
phone: +48 91 449 62 19, +48 91 449 62 11
mobile: +48 501 799 380

The Department of Landscape Design (DLD) groups specialists working primarily on:

- landscape design in different contexts (historical, post-industrial, urban, rural, waterfront, etc.);
- adaptation and conservation of historic landscapes;
- conservation and design of historical parks;
- analyses and surveys of cultural landscapes in the city and in the countryside of Western Pomerania and Poland;
- city and countryside landscape revitalisation;
- monumental landscape protection.

DLD employs 10 specialists in landscape and architectural design, cultural landscape protection and also in art, photography and graphics. DLD co-operates with other specialists (gardeners, florists, dendrologists, environmental protection specialists, naturalists, etc.).

The DLD's knowledge base enhances a variety of tasks related to city and countryside landscapes, surveys of cultural and historical landscape qualities, designs of all types of green areas (parks, squares, commons, playgrounds, waterfronts, decorative and utility gardens, green roofs and green walls etc.)

Offered expertise:

- research on history of cultural landscape;
- professional advice and consulting on historical landscapes and their elements;
- professional advice and consulting on city and countryside landscapes;
- programming and designing of different types of green areas;
- conservation of historical parks and other monumental green areas;
- dendrological inventories.

Keywords specifying the offered expertise:
landscape design, landscape planning, cultural landscape protection, landscape research, historical landscape research

Name Index

Bartkowiak Artur 7
Batóg Jacek 141
Bejger Romualda 108
Bernat Tomasz 148
Biedunkiewicz Anna 27
Bielawski Piotr Jan 125
Bury Marek 104
Cariow Aleksandr 80
Chady Tomasz 115
Chlewicki Wojciech 63
Chodźko Marcin 39
Chybowski Leszek 33
Clark Jeremy 53
Czech Zbigniew 40
Czerniawski Robert 96
Dąbrowski Waldemar 8
Deptuła Wiesław 95
Dołęgowska Barbara 54
Dybus Andrzej 22
El Fray Mirosława 28
Eliasz Jacek 126
Fabisiak Luiza 149
Filina-Dawidowicz Ludmiła 127
Forczmański Paweł 81
Friedrich Mariola 20
Furmańczyk Kazimierz 103
Gajdziński Sławomir 34
Garbalińska Halina 41
Gołaszewska Joanna 36
Grzejda Rafał 42
Hegazy Maged 78

Herosimczyk Agnieszka 15
Hołub Marcin 116
Hyla Tomasz 82
Iwan Stanisław 131
Jadczak Dorota 105
Janiszewska-Olszowska Joanna 55
Jankowski Jarosław 83
Jarnuszewski Grzegorz 106
Jaworski Zdzisław 117
Jędrzejczak-Silicka Magdalena 22
Jóźwiak Zofia 133
Kaczmarek Sławomir 29
Kalisińska Elżbieta 56
Karakulski Krzysztof 109
Katoła Anna 142
Kaup Magdalena 127
Kępczyńska Ewa 9
Kępczyński Jan 97
Kłoda Karolina 65
Koniuszy Adam 107
Korytkowski Przemysław 84
Kowalczyk Krzysztof 32
Kowalewski Mariusz 64
Kozak Artur 16
Krzyżyński Tomasz 118
Kucharska Elżbieta 58
Kucharska-Mazur Jolanta 57
Kuczyński Waldemar 119
Lachowicz Kazimierz 10
Łącka Irena ..143, 144
Łukaszewicz Alcaraz Aleksandra 147
Machaliński Bogusław 59
Majewski Maciej 72
Mantiuk Radosław 85
Matias Daniel 35

Matuszak-Slamani Renata 21
Michalska-Pożoga Iwona 31
Mielnik Lilla 108
Mierzecki Artur 65
Mila Andrzej 21
Milewski Dariusz 128
Mularczyk Mieszko 77
Murkowski Antoni 21
Nowakowski Michał 149
Okarma Krzysztof 73
Olewnik Marcin 135
Ozygała Krzysztof 37
Pałkowski Marek 86
Pamula Magdalena 38
Paszkiewicz Sandra 43
Paszkowski Zbigniew 155
Pelka Rafał 47
Pianko-Oprych Paulina 117
Piasecki Wojciech 102
Piesowicz Elżbieta 43
Pietrusewicz Krzysztof 74
Pietrzykowski Zbigniew 129
Piskier Tomasz 11
Pluciński Marcin 71
Powałka Bartosz 30
Protasowicki Mikołaj 12
Radziejewska Teresa 102
Rakoczy Rafał 98
Ratuszniak Piotr 75
Rejer Izabela 87
Rogoza Walery 88
Różewski Przemysław 89
Rudawska Iga 145
Rydzkowski Tomasz 31
Rzeszotarska-Pałka Magdalena 157

Seidler Teresa 58
Siwek Hanna 99
Skorupski Jakub 18
Stachowska Ewa 17
Stateczny Andrzej 134
Stepanowska Katarzyna 110
Stępień Grzegorz 100
Szatkowska Iwona 22
Szelangiewicz Tadeusz 132
Szymczak Mariusz 13
Szymczyk Anna 43
Ślączka Wojciech 130
Świecka Beata 146
Świtłyk Michał 150
Tarasiuk Jolanta 19
Tokarczyk Grzegorz 13
Tokarz-Deptuła Beata 60
Tomaszewska Maria 101
Tomkiewicz Dariusz 14
Typek Janusz 120
Weyna Stefan 44
Wiśnicki Bogusz 133
Witkowska Katarzyna 79
Witkowski Andrzej 102
Wojciechowska-Koszko Iwona 61
Wojciuk Bartosz 66
Wolski Waldemar 149
Wołejsza Piotr 136
Wróblewska Agnieszka 45
Zarzycki Paweł 62
Ziółkowski Andrzej 46
Zwierzewicz Zenon 76
Zwoliński Adam 156
Żegliński Grzegorz 90

Design and layout
Regional Centre for Innovation and Technology Transfer
West Pomeranian University of Technology, Szczecin

Publisher/editor
Artist & Painter – Zenon Pecko

Pictures:
Shutterstock

Regional Contact Point for EU Framework Programmes
phone: +48 91 449 47 23
email: rtd@zut.edu.pl
www.rpk.szczecin.pl

Support for this publication was provided by the Polish Ministry of Science and Higher Education

RCI LTT
REGIONAL CENTRE FOR INNOVATION and TECHNOLOGY TRANSFER
West Pomeranian University of Technology, Szczecin

West Pomeranian
University of Technology,
Szczecin

Regional Contact Point for EU Framework Programmes

phone: +48 91 449 47 23
email: rtd@zut.edu.pl
www.rpk.szczecin.pl

ISBN 978-83-7518-628-4