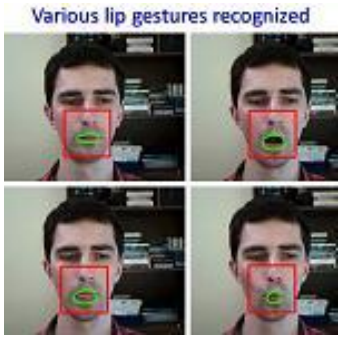
Outline of the presentations

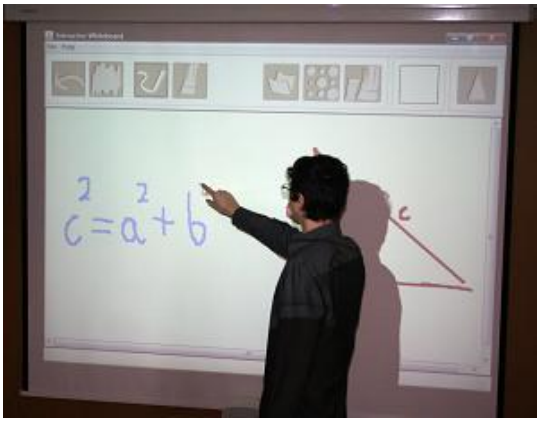
Prospects for future cooperation – presentations from leading Polish research centres

New applications of multimodal human-computer interfaces

Andrzej Czyzewski, Gdansk University of Technology, Gdansk, Poland, ac@pg.gda.pl, www.multimed.org

Developed multimodal interfaces for education applications and for disabled people are presented, including interactive electronic whiteboard based on video image analysis, application for controlling computers with mouth gestures and audio interface for speech stretching for hearing impaired and stuttering people and intelligent pen allowing for diagnosing and ameliorating developmental dyslexia. The eye-gaze tracking system named "Cyber Eye" is presented including the method of analysis of visual activity of patients remaining in vegetative state helping to assessment of their awareness. The scent emitting multimodal computer interface is also discussed. A new approach to diagnosing Parkinson's disease is shown which is used to evaluate motor and behavioral symptoms of the neurodegenerative disease. The paper is concluded with some additional demonstrations of technologies developed for applications to intelligent surveillance systems and for enhancement of degraded audio recordings.

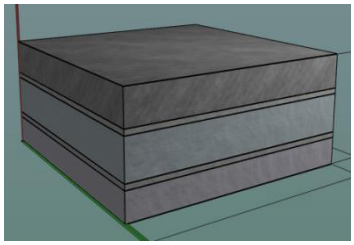




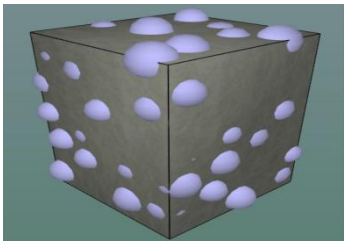
Thermal analysis methods for design of high conductivity composite materials

Piotr Spiewak, Warsaw University of Technology, Warsaw, Poland, pspiewak@inmat.pw.du.pl,
http://www.materials.pl/zpmmember.php?member=109

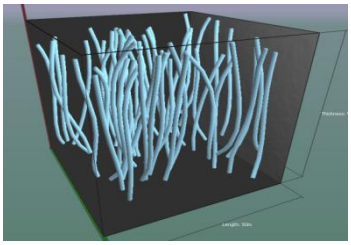
TERMET CAE is a software tool for thermal analysis and design of various composite material structures, represented by a unit volume a form of cuboid. Software operates with three most popular composite structures:



Stratified composite
(laminate, sandwich)



Particle-reinforced composite
(droplets, inclusions)



Fiber-reinforced composite
(various length and orientation)

Analysis mode − allows materials engineer to analyse temperature distribution in composite materials in various heating regimes.
Synthesis mode − allows materials engineer to estimate average values of heat parameters for newly designed composite structures

Calculations are based on a combination of analytical and numerical methods:

- 1D/2D/3D non-stationary analytical solution for stratified composites,
- 2D/3D stationary numerical solution for stratified, particle and fiber reinforced composites.

TERMET CAE software is built on classical client-server architecture for supporting multi-user and multi-project collaborative work. Flexible combination of analytical and numerical methods, material database and workflow services turns TERMET CAE software into outstanding tool for composite material studies.

Cognitive Techniques Applied to SDN and Network Management

Sławomir Kukliński, Orange Labs Poland & Warsaw University of Technology, Warsaw
slawomir.kuklinski@orange.com

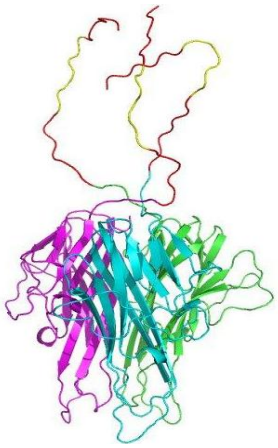
The importance of the high speed and effective communication infrastructure is at present of great importance. One of key factors of such infrastructure is easiness of deployment, real time optimization of the used resources and fast reaction to events such as faults, etc. In general the main idea is to have the networking infrastructure with Plug and Play capabilities that additionally can dynamically adapt the behavior according to operator's or users' needs. It has to be noted that such Plug and Play abilities will reduce and simplify the

network deployment, reduce the cost of network maintenance and will significantly increase network reliability and reduce the human error probability. The mentioned requirements concern not only networks, but also network services. The concept of autonomic network management is seen as a first step towards the vision. This concept is based on internal control loops of the management system. A part of each control loop is an algorithm that performs network adaptation according to obtained monitoring information about the network state. The design of such algorithm(s) is not a trivial task, but a nice solution can be provided by so called cognitive techniques, i.e. the algorithms that have learning abilities.
In my presentation I will show a generic architecture named GARSON, that is the enabler for programmable autonomic and cognitive management; a programmable distributed implementation framework (PDEE) that enables on-fly implementation of autonomic and cognitive algorithms (both solutions developed by Orange Poland), as well as selected cognitive algorithms that are applicable to the analyzed cases and can address also to coordination/orchestration problem. A special attention will be put to programmable LTE-SON networks and Software Defined Networking (SDN).

First-in-class dual-action anticancer protein

Jerzy Pieczykolan, Adamed

Adamed has carried out a research program in oncology primarily focused on the design of fusion proteins utilizing a naturally occurring cancer specific protein as a carrier. The fusions share a structural pattern of carrier armed with an effector peptide attached through an active linker. In essence, the key idea is to create “pro-drug” molecules exclusively activated in a tumor environment in order to trigger their full potential.
One of the most promising candidates in the program is a dual-action fusion protein codenamed AD-O51.4. The molecule induces cancer cell death primarily through activation of apoptotic pathways and blocking VEGF receptors expressed both on endothelial and cancer cells. It has shown cytotoxic activity against broad panel of different human cancer cell, including primary patient-derived lines. The protein has proven to be very safe. AD-O51.4 has also exhibited exceptional anticancer activity against several types of xenografted human tumors in mice and was well tolerated.



AD-O51.4 fusion protein

New bioactive food with designed functional properties

Joanna Kobus Cisowska, Poznan University of Life Sciences

Project is to develop technology and bring to market a brand new food, which will be designed for a specific healthy action and composed of such ingredients, which contain high concentration of bioactive phyto-compounds with similar action. The aim is to develop innovative technology for the production line of food products which can reduce the incidence of civilization diseases, including cardiovascular disease, obesity, diabetes and anemia. The principal of the project is to decrease civilization diseases incidence among society, significant improvement of the national health care and quality of life. The basic research program will be preceded by a market research study consumer preferences for food. The next step was the analysis of the raw materials which are rich source of active ingredients. The results of these studies was form the basis to compose the final products. Then a method of protection active ingredients was developed, including chemical, microbiological and enzymatic methods and type of packaging also. Financial products will be tested for their composition, safety and nutritional value. The final stage of testing will be verified of the functional characteristics in selected clinics. Finally all products can obtain a basis for a declaration of health. The project will be close with the most attractive market research products. The effect of the project will be patents and technological documentation.

Analysis of collaborative processes through process mining and social network analysis

Zbigniew Paszkiewicz, Poznań University of Economics

The term *process mining* is used to describe techniques, tools, and methods to discover, monitor and improve real business processes by extracting knowledge from event logs commonly available in today's information systems. Process mining is based on exploration of events generated by process-aware information systems during the execution of process instances.

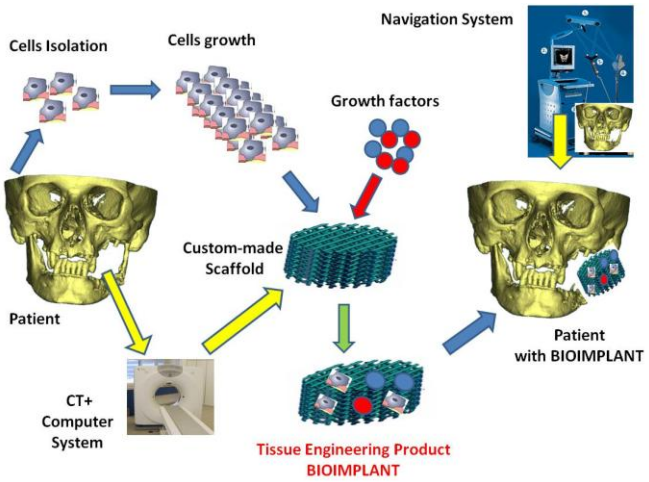
The research conducted in the Department of Information Technology at the Poznań University of Economics aims at development of new process mining methods for efficient discovering, analysis and improvement of collaborative processes performed by

organizations. A concept of service protocols has been coined to model behavioral and social aspects of collaboration. An RMV method has been developed to automatically discover *service protocols* from event logs generated during collaborative process execution. Service protocols discovered are used to correct, adjust and improve collaboration. Both concepts are implemented as a part of the ErGo System and open source software ProM Framework.

Bioimplants for the treatment of bone tissue in oncological patients

Wojciech Swieszkowski, Warsaw University of Technology

BIO-IMPLANT - Bioimplants for regeneration of bone tissue in oncological patients is a 4.5 year project with the budget of about 32 mln PLN funded by the European Regional Development Fund (ERDF) and the Polish State Funds. The project is coordinated by Warsaw University of Technology and realized in cooperation with Oncological Center in Warsaw, Wroclaw University of Technology, and Medical University of Warsaw.
The aim of the project is to develop a novel method for treatment of bone defects resulted from oncological operations. The new tissue engineered product (bioimplant) is being developed especially for regeneration of bone tissue in the maxillofacial region. The bioimplants are biodegradable and highly porous scaffolds and are custom made specifically for each patient. They are seeded with the patient own stem cells and support the cells in the process of new bone formation. The new computer controlled systems for the bioimplants design and implantation are also elaborated.



Recent progress in application of photocatalysis for water and wastewater treatment. Experiences from Polish - Japanese cooperation

Antoni W. Morawski, West Pomeranian University of Technology, Szczecin, Poland
Masahiro Toyoda, Oita University, Japan
Bunsho Ohtani, Catalysis Research Center, Hokkaido University, Japan
Sylwia Mozia, West Pomeranian University of Technology, Szczecin, Poland

Recent cooperation of WPUT, Szczecin with Japanese universities in the area of photocatalysis focuses mainly on: (1) preparation of photocatalysts for degradation of organic contaminants (WPUT – Catalysis Research Center) and (2) application of photocatalytic membrane reactors (PMRs) for water/wastewater treatment (WPUT – Oita University). Within the framework of action (1) a series of innovative TiO_2-based photocatalysts was prepared and their high efficiency under Vis light was confirmed. The possibility of utilization of solar light creates photocatalysis a cheap and environmentally friendly technology for treatment of gaseous and aqueous streams. Research realized during action (2) proved that PMRs utilizing membrane distillation or ultrafiltration are promising alternatives for conventional water/wastewater treatment processes, especially when final polishing is considered. Their high potential in removal of pharmaceuticals from primary and secondary effluents was confirmed.

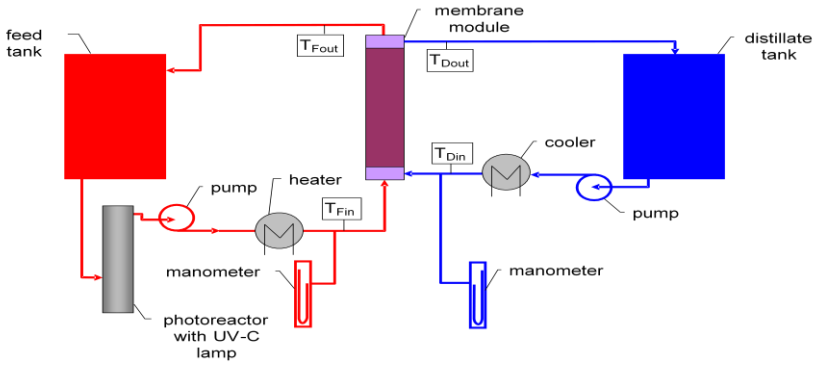
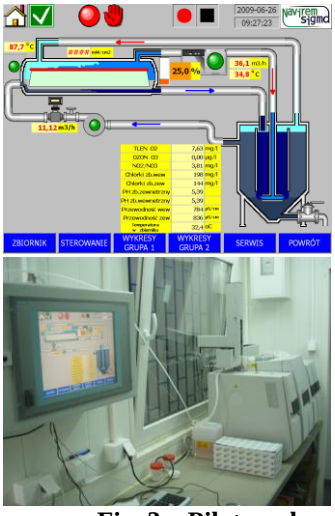


Fig. 1. Photocatalytic membrane laboratory plant

Fig. 2. TiO2 photocatalyst from WPUT



Visualized parameters :

On-line:
- intensity of UV radiation
- ozone concentration
- O_2 concentration
- chloride ions concentration
- pH
- NO_2/NO_3 concentration
- conductivity
- temperature and flow rate of solution
- temperature and air flow velocity

Periodically collected:
- total organic and inorganic carbon concentration(TC, TOC, IC)
- total nitrogen concentration(TN)
- absorbance UV-Vis

Fig. 3. Pilot scale photocatalytic plant.

Bioactive lotion for daily face skin protection against melanoma development

Andrzej W. Lipkowski[1], Sergiusz Markowicz[2], Joanna Matalinska[1], Katarzyna Kurzepa[3], Marta Bochynska[1], Marzena Biernacka[2], Anna Samluk[2], Dorota Dudek[2], Henryk Skurzak[2], Masaaki Yoshikawa[3]

[1] Mossakowski Medical Research Centre, Polish Academy of Sciences,Warsaw, Poland

[2] Maria Sklodowska-Curie Memorial Institute and Oncology Centre, Warsaw, Poland

[3] Research Institute for Production Development, Sakyo-ku, Kyoto, Japan

INTRODUCTION

Proteins are metabolized into short peptides. Professor Andrzej W. Lipkowski of Mossakowski Medical Research Centre Polish Academy of Sciences and Professor Masaaki Yoshikawa primary of Kyoto University, currently Research Institute for Production Development, Kyoto, established long term collaboration on searching for bioactive peptides that are enzymatically released from natural proteins. This cross collaboration resulted in number of ideas and products originally developed in Japan and/or Poland. The presented invention has been developed at Mossakowski Medical Research Centre Polish Academy of Sciences but Professor Yoshikawa has been consultant of the project.

HYPOTHESIS of INVENTION

Skin exposition to sun light (both UV A and UV B) provides risk of burn and melanoma development. Therefore, a number of protective lotions were developed to protect skin from over exposition to sun light in occasion like beaching. Although these lotions are very effective in protection from overburning, their melanoma protection abilities are questionable. Moreover, even everyday not intentional expositions to sun provides some risk of skin cancer development.

Chronic sun exposure is the cause of actinic keratosis, first stage for skin cancer development, including melanoma. Sun damage to the skin is cumulative, so even a brief period in the sun adds to the lifetime total. Cloudy days aren't safe either, because 70-80 percent of solar ultraviolet (UV) rays can pass through clouds. These harmful rays can also bounce off sand, snow and other reflective surfaces, giving an extra exposure. The ultraviolet radiation given off by the lamps in a tanning salon can be even more dangerous than the sun. Individuals whose immune defenses are weakened by age, cancer chemotherapy, AIDS, organ transplantation or excessive UV exposure are more likely to develop actinic keratosis, followed by skin cancer.

We hypothesized that hair and wool act not only as physical protection but also their decomposition products may provide biological skin protection.

INVENTION

We found that natural mixture of small peptides enzymatically released from hair and/or wool have anti-melanoma properties.

Moreover, these peptides express some additional active conditioning properties.

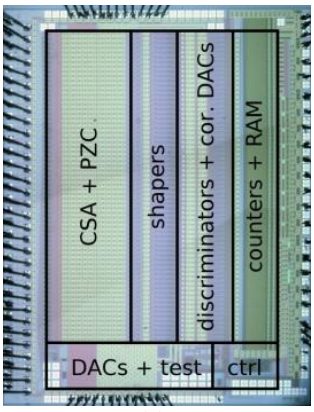
Therefore, we proposed to use peptides obtained from hair proteins as components of everyday skin lotion.

The proposed lotion should be particularly beneficial for face skin that is constantly exposed to sun light.

Cooperation between AGH University of Science and Technology and Rigaku Corporation in advanced microelectronic technologies

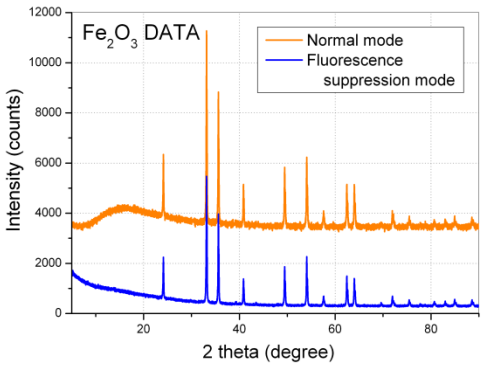
Pawel Grybos , AGH UST Cracow, Poland, pawel.grybos@agh.edu.pl
Taguchi Takeyoshi, Rigaku Corporation, Tokyo, Japan, takey@rigaku.co.jp

AGH University of Science and Technology and Rigaku Corporation have been working together on advanced digital position sensitive X-ray imaging systems since 2007. An exemplary result of this cooperation is a very fast D/teX Ultra X-ray detection module, equipped with two RG64 multichannel integrated circuit designed by AGH-UST. Replacing a conventional scintillation counter with D/teX Ultra on an in-house X-ray diffraction system, one can reduce data acquisition time by 1/100, or improve sensitivity 100 times when the same data acquisition time is applied. In practice, using D/teX Ultra, one can measure a specimen within a minute, or is able to measure a very weak diffraction peak easily. In addition to this, the RG64 connected to a silicon strip detector has a capability of photon counting in a narrow, precisely set energy window. This feature is significantly useful to measure a specimen which produces fluorescence X-ray (Fe_2O_3, MnO_2, etc.) and allows suppressing fluorescence background considerably without any additional cost. Suppressing fluorescence background improves the data quality and enables accurate data analysis. The cooperation between AGH-UST and Rigaku Corporation continues and new products are developed.



(a)

(b)



(c)

Fig. 1.(a) Integrated circuit RG64 (3mm x4 mm) designed by AGH, (b) D/tex Ultra module produced by Rigaku and mounted in diffractometer arm, (c) examples of measured diffractograms in normal and fluorescence suppression mode.

Auditory and Tactile Brain Computer Interfaces for Locked-in State Patients and Healthy Users

Tomasz M. Rutkowski, Hiromu Mori, MoonJeong Chang, Shota Kono, Daiki Aminaka and Chisaki Nakaizumi
Tsukuba University

State-of-the-art stimulus-driven brain-computer interfacing paradigms rely mostly on visual or auditory modalities. Recently tactile (or haptic) modality approaches have been proposed to offer alternative ways to deliver sensory stimulation inputs which could be crucial for locked-in state patients suffering from weak or lost eye-sight or hearing. A concept of combining multi-sensory stimuli creates a very interesting and natural for human beings possibility to deliver rich interactive interfacing and communication alternative for LIS/ALS suffering as well as healthy users with a very fast information transfer rate. The presentation will introduce and review the classical BCI examples and novel applications developed by Prof. Rutkowski and his students in Life Science Center of TARA, University of Tsukuba, Japan. Student project demonstrations and BCI prototypes will be also presented with possible hands-on experience from the symposium audience.

Conversational Informatics for Technology Enhanced Social Intelligence

Toyoaki Nishida
Graduate School of Informatics, Kyoto University

Recent advancement of artificial intelligence technology, such as Siri, Google Driverless Car, and IBM Watson, has allowed us to bear a rather concrete image of our technology enhanced life in the network age. In order for us to build a technology enhanced social intelligence based on "super intelligence," we need to build a new communication technology for allowing people and super intelligence to establish better communication with each other. The long term goal of our research is to build intelligent autonomous agents that can establish empathic relationships with people by good service, presence, and awareness. Towards this end, we aim at realizing a "primordial soup of conversational agents" in which people and agents converse each other to build, maintain and exploit CALV (Community's Artifacts of Lasting Value). In this talk, I will highlight recent technical developments in building a smart environment that can support cyber-physical conversations among people and agents.

The ideas have evolved as a result of discussions in many years with Polish friends, among others, a Japan-Polish workshop on Intelligent Media Technology held in Warsaw on September 13-14, 2004, supported by Prof. Tomasz M. Rutkowski who was a postdoc at Kyoto University at that time. In December 2009, I delivered "five lectures on a social intelligence design and conversational informatics" as a part of Wrocław Information Technology Initiative to discuss theories and techniques underlying our approach with graduate students of Wroclaw University of Technology. In addition to our continuing

collaboration with Prof. Rutkowski, we indebted from collaboration and discussions with Prof. Andrzej Skowron (Institute of Mathematics, Warsaw University), Prof. Ngoc Thanh Nguyen (Wroclaw University of Technology), Prof. Janusz Sobecki (Wroclaw University of Technology), and Prof. Dariusz Krol (Wroclaw University of Technology).

How signal processing works in brain machine interface applications

Toshihisa Tanaka, Tokyo University of Agriculture and Technology

Signal processing is a fundamental technology in a wide range of engineering applications such as speech/audio, imaging, and communications. Brain machine interfacing (BMI) is a recently well-studied application of signal processing. In this talk, it will be addressed with some practical problems and examples that signal processing is a key technology to establish paradigms of BMI.

About the authors

Prof. Andrzej Czyżewski is a native of Gdansk, Poland. He received his M.Sc. degree in Sound Engineering from the Gdansk University of Technology, Poland in 1982, his Ph.D. degree in 1987 and his D.Sc. degree in 1992 from the Cracow Academy of Mining and Metallurgy in Poland. He joined the staff of the Sound Engineering Department of the Gdansk University of Technology in 1984. In December 1999 Mr. President of Poland granted him the title of Professor. In 2002 the Senate of his University approved him to the position of Full Professor. He is an author of more than 500 research papers published in international journals or presented in congresses & conferences around the World. He is also author of 10 Polish patents in the domain of computer science and 6 international patents. Prof. Czyżewski serves as Head of the Multimedia Systems Department of Gdansk University of Technology; He holds Fellowship of the Audio Engineering Society and he is a member of: IEEE, International Rough Set Society, and others. He acted as a leader of more than 30 domestic research grant projects and 6 international projects. He together with his research team won around 40 domestic and international prizes and medals for their achievements in engineering science.

Pawel Grybos received the M.Sc. degree in electronics and the Ph.D. degree in physics (cum laude) from AGH University of Science and Technology, Cracow, Poland in 1991 and 1995, respectively. He obtained D.Sc. degree in in 2004 and the title of Professor in 2011. He is a leader of Microelectronic Group (http://www.kmet.agh.edu.pl/asics) at the Department of Measurement and Electronics, AGH-UST and he is a chair of IEEE SSCS Chapter Poland. His main research area are low-noise multichannel integrated circuits in nanometer and 3D technologies for neurobiology, physics, and medical applications used in many scientific experiments and industrial instrumentation. He is an author or co-author of about 200 publications, 4 books and 8 patents.

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Biographical Sketch:
Professor Antoni Morawski was born on June 13, 1951. Two years after getting a D. Sc. degree (1990) at Szczecin University of Technology (SUT) he was promoted to an associate professor at the Institute of Chemical and Environment Engineering, SUT (present name West Pomeranian University of Technology-WPUT). In the same year (1992) he got a position of Head of Department of Water Technology and Environmental Engineering at the Faculty of Chemical Engineering, SUT. In 1995 he got a full professor position. For 6 years (1999-2005) he was the Head of Ph.D. course at the Faculty of Chemical Engineering. Since 2005 Prof. Morawski is the Director of the Institute of Chemical and Environment Engineering.
Prof. Morawski has started his research work on photocatalysis in 1992, when very few research groups in the world were working in this field. He contributed to the development of photocatalysis and related topics in Poland, being a precursor in photocatalytic treatment of water and wastewater in the country. At present, his research group is the most important one in Poland in the field of photocatalysis and environmental engineering and technology.
Prof. Morawski has gained considerable experience of close cooperation with numerous researchers and research institutions worldwide. In 1983 he gained laboratory practice at the Eindhoven University of Technology in Holland. He was a visiting professor at the Hokkaido University, Division of Materials Chemistry and Engineering in Hokkaido, Japan in 1993 and 1997. In 1999 he was granted a prestigious scholarship by the Japan Society for Promotion of Science for doing research at the Hokkaido University. He had close cooperation with the Aichi Institute of Technology (Prof. M. Inagaki) and Oita University (Prof. M. Toyoda) in the field of preparation and characterization of new photocatalysts based on carbon modified TiO_2.
The research group of Prof. Morawski was included in the European COST Action 540 "PHONASUM" - *Photocatalytic technologies and novel nanosurface materials – critical issues*, which finished in 2010. Prof. Morawski is the leader and manager of a few domestic

projects on preparation of innovative visible light active nano-photocatalysts for removal of organic contaminants under solar irradiation. His research group is also involved in other projects in the field of photocatalysis, which are focused on e.g. preparation of TiO_2 modified with iron and carbon, preparation of visible light active TiO_2 modified with WO_3, preparation of Ag-doped TiO_2 for self cleaning and sterilizing application, design and development of photocatalytic membrane reactors, water treatment by photo-Fenton, immobilization of TiO_2 onto textiles and many others, including "photo-biogas" production from organic compounds by using photocatalysis on modified TiO_2. On a basis of the results of the investigations, numerous domestic patent applications were prepared and patents were granted. The photocatalytic paint for self-cleaning developed by Prof. Morawski was implemented in production by Polish company "Pigment". Prof. Morawski has also designed and developed a pilot scale installation for photocatalytic treatment of wastewater, in which a TiO_2 photocatalyst prepared by his group has been applied.

Prof. Morawski has also a great experience in education. He has supervised more than 100 Master and 15 PhD students theses in the field of photocatalysis. Six co-workers from his research group got habilitation and subsequently professor positions at WPUT. Members of his research group got doctoral/postdoctoral fellowships in foreign institutes, such as Energy and Environmental Research Centre at University of North Dakota (USA), University of Newcastle upon Tyne (UK), Vienna University (Austria), Department of Applied Chemistry at Oita University, Aichi Institute of Technology, Faculty of Engineering at Gunma University, National Institute of Industrial Science and Technology and National Institute for Resources and Environment in Tsukuba (Japan), École Polytechnique Federale De Lausanne (EPFL, Switzerland).

Professor Morawski is an author and co-author of almost 140 Polish patents and patent applications, 1 international patent (WO/PCT) as well as more than 100 of works performed under cooperation with industry. He has published more than 400 peer-reviewed papers as well as sections in four books. Based on 201 documents listed in Web of Knowledge the total Science Citation Index **SCI = 3015** and the Hirsch index **h = 33** (data from July 15, 2013). Prof Morawski has also presented the results of his research at almost 400 conferences and was member of 21 committees of international conferences. He is the member of the European Photocatalysis Federation and the Carbon Society of Japan, member of editorial board "Journal of Materials" and "Polish J. Chemical Technology". 16 articles Elsevier journals contributed by Prof. Morawski were kept on the list of TOP25 Hottest Articles.

Toyoaki Nishida is Professor at Department of Intelligence Science and Technology, Graduate School of Informatics, Kyoto University. He received the B.E., the M.E., and the Doctor of Engineering degrees from Kyoto University in 1977, 1979, and 1984, respectively. His research centers on artificial intelligence and human computer interaction. He opened up a new field of research called conversational informatics in 2003. He collected and compiled representative works in conversational informatics as: Nishida (ed.) Conversational Informatics -- An Engineering Approach, Wiley, 2007. Currently, he leads several projects related to conversational informatics. He serves for numerous academic activities, including an associate editor of the AI & Society journal, an area editor (Intelligent Systems) of the New Generation Computing journal, a technical committee member of Web Intelligence Consortium, and an associate member of the Science Council of Japan. During FY 2010-2011, he served as the president of JSAI (Japanese Society for Artificial Intelligence). During FY 2010-2012, he served as a senior program officer of Research Center for Science Systems, JSPS (Japan Society for the Promotion of Science). Currently, he is working for as a deputy research supervisor for a CREST project "Creation of Human-Harmonized Information Technology for Convivial Society" of JST (Japan Science and Technology Agency).

Joanna Kobus-Cisowska, born 1980, received her Ph.D. in 2004 in Food Technology from Poznan University of Life Sciences, Faculty of Food Science and Nutrition, where she work as a Proffessor's assistant. Dr. Kobus-Cisowska conducts research on the natural antioxidants and bioactive food. She graduated also from Poznan School of Banking - Project Manager studies. She has a Certificate of Internal Auditor HACCP (DEKRA Certification) and she is a member of PTTŻ Polish Society of Food Technologists and member of The European Federation for the Science and Technology of Lipids. Since 2010 she work at POIG 01.01.02-00-069/09 "New bioactive foods with designed functional

properties" as executor of the project research and as employee of the administrative team research project also.
Her main research area are food technology, mainly focuses on composition and antioxidant activity of plant extracts in bulk oil and emulsified lipid systems. Antioxidant activity is quantified by selected lipid oxidative stability indicators. She is an author or co-author of about 34 publications, 64 reports and 8 patents and served as a reviewer to many conferences and journals.

Dr Sławomir Kukliński received Ph.D. degree in Telecommunications from Warsaw University of Technology (WUT), Institute of Telecommunications, in 1994 with honors and since then he is Assistant Professor there. He is teaching about mobile and wireless systems. From 2003 he works also for Telekomunikacja Polska R&D Centre (at present it is Orange Labs Poland) as research expert. He has 25 years long experience in telecommunications. From 12 years he is focused on Future Internet and mobile and wireless systems. He led many national research projects as principal investigator. In his career he was also involved in many international projects. At the university he was involved in EU funded FP6 MIDAS project concerning context aware routing. Till 2011 he was involved in EU FP7 projects EFIPSANS (autonomic management) and ProSense (sensor networks). In 2008 he has started national project focused on autonomic wireless mesh networks. From 2013 he is the coordinating 3 years long bilateral Polish-Luxembourgish project on Cognitive SDN (CoSDN) – in the framework of Pol-Lux cooperation. The project is co-sponsored by NCBiR.
In Orange Labs Poland Slawomir Kuklinski is working on autonomic management in the Future Internet. From January 2008 till July 2010 he was involved in EU founded FP7 project 4WARD. In the framework of this project he worked on the In-Network Management (INM) concept. At present he is playing a key role in the Celtic COMMUNE Project (2011-2014) which concerns cognitive network management under uncertainty. Slawomir Kuklinski also participates in ITU-T standardization (Study Group 13). He published many conference or journal papers, was a member of TPC of many conferences, and served as a reviewer to many conferences and journals, including IEEE Communications Magazine.

Zbigniew Paszkiewicz is a research assistant in the Department of Information Technology at the Poznań University of Economics. He is also a Ph.D. student at the Faculty of Electronics, Telecommunications and Informatics at the Gdansk University of Technology. He graduated from the Poznań University of Technology and the Poznań University of Economics. His main research topic is process mining and automated business process discovery. He is also interested in computer support for virtual organizations, integration of technologies and business processes, and adaptive business processes. Currently, he works on novel process mining methods for analysis and improvement of collaborative processes performed by organizations. His research is supported by the Polish National Science Center. He is experienced in deployment of process mining methods in industry.
He was involved in many EU-founded projects concerning computer support for virtual organizations and multimedia systems. He has been a mentor and consultant of many IT-based innovative student projects, e.g., Multiboard platform for building and playing interactive, multiplayer board games that was awarded the Excellence Award in Imagine Cup 2013.
More information: http://www.kti.ue.poznan.pl/en/zbigniew_paszkiewicz.html

Jerzy Pieczykolan
A graduate of John Paul II Catholic University of Lublin, Dr Pieczykolan holds a PhD degree in cellular biology. From the very beginning of his professional career he has been associated with Adamed serving positions from Junior Scientist to current functions as Head of Research Laboratory and Principal Investigator in Oncology. He has gained a considerable experience in management of scientific research as a leader of „3CLA – biologic targeted anticancer therapy" project, which has been the largest R&D venture in terms of scope and financial budget in Adamed history. He is involved in both scientific and operational management of research. His ideas and concepts are behind the inventions conceived under the project. Dr Pieczykolan is an author of 9 patent applications claiming

molecules of potential use as therapeutics in oncology. Results of the project have been recognized by representatives of pharmaceutical sector at International Bio conferences in USA and Europe as well as members of scientific community at AACR Annual Meeting in 2013 and EORTC-NCI-AACR Symposium on Molecular Targets and Cancer Therapies in 2012.
During his presentation Dr. Pieczykolan is going to present one of the most promising biomolecules of anticancer properties designed under the framework of 3CLA project.

Tomasz M. Rutkowski received his M.Sc. in Electronics and Ph.D. in Telecommunications and Acoustics from Wroclaw University of Technology, Poland, in 1994 and 2002, respectively. He received postdoctoral training at the Multimedia Laboratory, Kyoto University, and in 2005-2010 he worked as a research scientist at RIKEN Brain Science Institute, Japan. Currently he serves as Assistant Professor at the University of Tsukuba, and as a visiting scientist at RIKEN Brain Science Institute. Professor Rutkowski's research interests include computational neuroscience, especially brain-computer interfacing technologies, computational modeling of brain processes, neurobiological signal and information processing, multimedia interfaces and interactive technology design. He is a senior member of IEEE, a member of the Society for Neuroscience, and the Asia-Pacific Signal and Information Processing Association (APSIPA). He is a member of the Editorial Board of Frontiers in Fractal Physiology and serves as a reviewer for PLOS One, IEEE TNNLS, IEEE TSMC – Part B, Cognitive Neurodynamics, and the Journal of Neural Engineering, and others.

Wojciech Swieszkowski, Ph.D., Habil., Assoc. Prof. in Materials Design Division, Faculty of Materials Science and Engineering, Warsaw University of Technology, POLAND; Expert in the field of biomaterials, including biomaterial synthesis, characterisation and modelling, cell-biomaterial interactions, smart biomaterials for tissue regeneration, drug delivery, advanced design, fabrication and fabrication of scaffolds; Biomaterials Group

leader (7 post doctorate and 12 PhD students); Leader and project manager of the 4 national grants and 4 EC FP6 grants, 3 COST Actions; 2 Era-Net projects; Coordinator of the Polish-Japan PhD study in Materials Science, Coordinator of the Polish-Singapore project in tissue engineering, author of about 100 publications, 6 book chapters and 5 patents, over 300 citations.

Piotr Śpiewak

Born on May 11, 1978. M.Sc. degree in Optoelectronics and Fiber Technology (2002, Wroclaw University of Technology, Poland), Ph.D. degree in Materials Science (2010, Warsaw University of Technology, Poland).

He studied Optoelectronics and Fiber Technology at the Wroclaw University of Technology where he obtained his Master's degree in 2002 at Electronics and Telecommunication Department. He then took professional experience at the Institute of Electronic Materials Technology (ITME) in Warsaw (Poland), in III-V crystal growth, especially indium phosphide (InP) crystals.

From January 2003, he joined the Umicore, where he started as crystal growth operator for InP. A major part of the work covered the development of InP growth technology using CAE for modelling and developing process and software itself. In January 2004, he changed his responsibilities as process development engineer at Umicore Electro-Optic Materials for germanium crystal growth modelling. He advanced his modelling experience as contractor of two commercial research projects of the European Space Agency.

During the work at Umicore, from March 2005, he has started PhD study at Warsaw University of Technology. His research focuses on defect engineering in germanium single crystal, which includes modelling in atomistic scale (density functional theory and molecular dynamics) through meso scale (defect precipitation model) to macro scale models based on finite volume method. He received the degree of Doctor in Technical Science in January 2010.

From March 2010, he took up the position of Senior Scientific Specialist at Faculty of Materials Science and Engineering of Warsaw University of Technology, where he is currently working. His work is focused on modelling of semiconductor materials and project management. He has been manager (work package manager) of national strategic research project TERMET as well as other national research projects financed by the Polish Ministry of Science and Higher Education and the National Science Centre.

Takeyoshi Taguchi graduated Kyushu University, Physics department, Fukuoka, Japan in 1986 and join Rigaku Corporation. He has studied X-ray microscopy at King's college London, the University of London from 1986 to 1989. He was involved in the soft X-ray laser project at the Institute for Solid State Physics of the University of Tokyo from 1989 to 1991. He received the Ph. D degree from Tohoku University, Sendai, Japan in 2004. He has been involved in development projects, such as, a laboratory EXAFS system and X-ray detectors. He is an author or co-author of about 20 publications and 11 patents.

Toshihisa Tanaka received the B.E., the M.E., and the Ph.D. degrees from the Tokyo Institute of Technology in 1997, 2000, and 2002, respectively. From 2000 to 2002, he was a JSPS Research Fellow. From October 2002 to March 2004, he was a Research Scientist at RIKEN Brain Science Institute. In April 2004, he joined Department of Electrical and Electronic Engineering, the Tokyo University of Agriculture and Technology, where he is currently an Associate Professor. In 2005, he was a Royal Society Visiting Fellow at the Communications and Signal Processing Group, Imperial College London, U.K. From June 2011 to October 2011, he was a visiting faculty member in Department of Electrical Engineering, the University of Hawaii at Manoa.

His research interests include image and signal processing, multirate systems, statistical signal processing and machine learning, brain and biomedical signal processing, and adaptive systems. He is a co-editor of Signal Processing Techniques for Knowledge Extraction and Information Fusion (with Mandic, Splinger), 2008.

He served as a guest editor of special issues in journals including Neurocomputing. He has served as an associate editor of IEICE Transactions on Fundamentals. He was a chair of the Technical Committee on Biomedical Signal Processing, APSIPA. He is a senior member of IEEE, and a member of IEICE and APSIPA.