IEEE EMB

ETAT 2015

2ND IEEE EMBS SUMMER SCHOOL ON EMERGING TECHNOLOGIES AND APPLICATIONS IN TELEMEDICINE

16TH - 22ND AUGUST 2015
SMOLENICE CASTLE, SLOVAKIA

NATIONAL CENTER OF TELEMEDICINE SERVICES (NCTS)

SLOVAK UNIVERSITY OF TECHNOLOGY IN BRATISLAVA
FACULTY OF ELECTRICAL ENGINEERING AND
INFORMATION TECHNOLOGY

INSTITUTE OF MEASUREMENT SCIENCE
SLOVAK ACADEMY OF SCIENCES

Announcement

The 2nd IEEE EMBS Summer School on Emerging Applications and Technologies in Telemedicine will provide opportunity for learning and exploring on enabling state-of-the-art telemedicine technologies and applications for acquisition, transmission, processing, storage, retrieval, visualization, and analysis of patients' and health data. Theme of this year edition will cover **challenges from wearable devices to Big data in healthcare**. Focus will be on lectures on integrative and novel health informatics solutions to better translate discovery into clinical solutions and support precision medicine. Tutorials will 'deep dive' in wireless and monitoring platforms, cardiovascular health informatics, e-p-m-Heath, biomedical Big data analytics and intelligence. Presentations will include clinical studies on chronic disease management, diabetes, and cardiovascular diseases.

Distiguished faculty from the field of Biomedical Engineering and Health Informatics will provide detailed expertise in the following domains:

Pervasive, intelligent, and context-aware Body Sensor Networks (BSN), Body Area Networks (BAN), body nets, Wearable and implantable sensor and devices, Multi-sensor data and information fusion, Mobile health technologies (mHealth), Big data analytics in healthcare, Data Integrity, Data Integration, Case-Based Reasoning, Real-Time Health and Clinical Decision Making, Formalism for healthcare modeling and informatics solutions, Knowledge discovery and decision support, Applications in cardiovascular diseases, Informatics for chronic disease management, Applications of telemedicine on active and healthy ageing, Supportive technologies for adherence to medical plans.

Round table with healthcare and ICT industry representatives will support the interaction between education, research, clinical practice and industry. Such open and interactive discussion can support our attendees to gain new insights and perspectives on telemedicine resulting in better transfer of research results into market products and services.

The summer school will be held at the castle situated in beautiful surroundings of the village Smolenice located in the west of Slovakia, about 60 km from the capital city Bratislava. First written documents about the existence of Smolenice date back to the 13th century. Castle was built in 15th century and since then have been owned by aristocratic families. During Napoleon wars the main building and tower was considerably damaged by fire. Restoration began in 19th century and was finished during 50's of the last century. Since then it is owned by Slovak Academy of Sciences as its representative congress centre.

We hope that the 2nd IEEE EMBS Summer School on Emerging Technologies and Applications in Telemedicine: *Addressing the Challenges from Wearable Devices to Big Data in Healthcare* will provide interesting lectures, seminars and discussions in a rapidly evolving field and foster motivation and participation of our attendees and colleagues in the adventure of exploration and learning in this research domain.

Dr. Fedor Lehocki

Chair and Organizer
Summer School on Emerging Technologies and Applications in Telemedicine

Program

	Sunday August 16th
19.00h	Welcome dinner

	Monday August 17th
8.00h-9.00h	Breakfast
9.00h-10.30h	prof. Toshiyo Tamura Seamless Monitoring of Physiological Information in Daily Life: Retrospectives and Perspectives
10.30h-11.00h	Break
11.00h-12.30h	prof. Toshiyo Tamura Seamless Monitoring of Physiological Information in Daily Life: Retrospectives and Perspectives
12.30-14.00h	Lunch and discussion
14.00h-15.30h	prof. Ralf Seepold Stress pattern recognition and its influence on healthy sleep
15.30h-16.00h	Break
16.00h-17.30h	prof. Ralf Seepold Stress pattern recognition and its influence on healthy sleep
17.30h-18.00h	Discussion: Summary of the day
18.00h-19.00h	Dinner
19.00h-20.30h	Poster Session + discussion

	Tuesday August 18th
8.00h-9.00h	Breakfast
9.00h-10.30h	Dr. Giuseppe Fico A Multidisciplinary reference framework to support implementation and assessment of Diabetes Care in Community Settings through engineering methods and technologies.
10.30h-11.00h	Break
11.00h-12.30h	Dr. Giuseppe Fico A Multidisciplinary reference framework to support implementation and assessment of Diabetes Care in Community Settings through engineering methods and technologies.
12.30-14.00h	Lunch and discussion
14.00h-15.30h	prof. Ron Summers Ideation Methods Applied to Grand Engineering Challanges
15.30h-16.00h	Break
16.00h-17.30h	prof. Ron Summers Ideation Methods Applied to Grand Engineering Challanges
17.30h-18.00h	Discussion: Summary of the day
18.00h-19.00h	Dinner
19.00h-20.30h	Poster Session + discussion

Wednesday August 19th

8.00-9.00h	Breakfast
9.00h-10.30h	prof. Friedrich Koehler
10.30h-11.00h	Break
11.00h-12.30h	prof. Friedrich Koehler
12.30h-14.00h	Lunch and discussion
14.00h-22.00h	Afternoon in Bratislava (leaving at 14.00h). Returning at 22.00h

Thursday August 20th

7.30h-8.30h	Breakfast
8.30h-10.00h	prof. May D. Wang Biomedical Big Data Analytics for Telemedicine and Outcome-Driven Health Care
10.00h-10.30h	Break
10.30h-12.00h	prof. May D. Wang Biomedical Big Data Analytics for Telemedicine and Outcome-Driven Health Care
12.00h-13.00h	Lunch and discussion
13.30h-15.00h	Meet the Editors
15.00h-15.30h	Break
15.30h-17.00h	Dr. Erez Shalom Enhancing patient safety using guideline based decision support systems
17.30h-19.00h	Business & clinical round table
19.00h-20.00h	Dinner
20.00h-24.00h	Best poster awards & wine tasting at the castle

Friday August 21st

8.00h-9.00h	Breakfast
9.00h-10.30h	Dr. Erez Shalom Enhancing patient safety using guideline based decision support systems
10.30h-11.00h	Break
11.00h-12.30h	prof. Metin Akay Advanced NeuroTechnologies for Human Brain Initiatives
12.30h-14.00h	Lunch and discussion
14.00h-15.30h	prof. Metin Akay Advanced NeuroTechnologies for Human Brain Initiatives
15.30h-16.00h	Break
16.00h-17.30h	Discussion: Summary of the day and the summer school
17.30h-19.00h	Free time
19.00h-21.30h	Farewell Grill Party

Saturday August 22nd

8.00h-9.00h	Breakfast
9.00h-10.30h	Departure to airport

Distinguished faculty

prof. Metin Akay is currently the founding chair of the new Biomedical Engineering Department and the John S. Dunn professor of biomedical engineering at the University of Houston. He received his B.S. And M.S. in Electrical Engineering from the Bogazici University, Istanbul, Turkey in 1981 and 1984, respectively and a Ph.D. degree from Rutgers University in 1990. Dr. Akay has played a key role in promoting biomedical education in the world by writing and editing several books, editing several special issues of prestigious journals, including the Proc of IEEE, and giving more than hundred keynote, plenary and invited talks at international conferences, symposiums and workshops regarding emerging technologies in biomedical engineering.

He is the founding editor-in-chief of the Biomedical Engineering Book Series published by the Wiley and IEEE Press and the Wiley Encyclopedia of Biomedical Engineering. He is also the editor of the Neural Engineering Handbook published by Wiley/IEEE Press and the first steering committee chair of the IEEE Trans on Computational Biology and Bioinformatics. He established the Annual International Summer School on Biocomplexity from Gene to System sponsored by the NSF and the IEEE EMBS and is the founding chair of the IEEE EMBS Special Topic Conference on Neural Engineering.

He is also the chair of the IEEE EMBS Neuroengineering Technical Committee. He was the program chair of the International IEEE EMBS 2001 and the co-chair of the Annual International IEEE EMBS 2006 and the program co-chair of the Annual International IEEE EMBS 2011 conference which held in Boston . He currently serves on the advisory board of several international journals and on several NIH and NSF review panels.

Dr. Akay is a recipient of the IEEE EMBS Early Career and Service awards as well an IEEE Third Millenium Medal and is a fellow of IEEE, the Institute of Physics (IOP), the American Institute of Medical Biological Engineering (AIMBE) and the American Association for the Advancement of Science (AAAS). His Neural Engineering and Informatics Lab is interested in developing an intelligent wearable system for monitoring motor functions in Post-Stroke Hemiplegic Patients and detecting coronary artery disease. In addition, his lab is currently investigating the effect of nicotine on the dynamics of ventral tegmental area (VTA) dopamine neural networks as well as the detection of coronary occlusions.

Dr. Giuseppe Fico

Giuseppe Fico was born in Italy, in 1980. He received the Diploma degree in Electronic Engineering (2005) by the University of Naples Federico II (Italy), with the specialization in Biomedical Engineering. In 2007, Giuseppe received the Master of Advanced Studies (MAst.) in Biomedical Engineering by the Technical University of Madrid, Spain (UPM). He is currently project manager and head of the health care team in the Life Supporting Technologies research group of the Telecommunication Engineering Faculty at UPM. His research focuses on ICT for Health, Ageing Well and Inclusion, with special attention to chronic disease management and diabetes. He has been project leader, on behalf of UPM, in several European research grants, mainly in the field of telemedicine and mobile health. Currently he

is the Technical Manager of two projects dealing with diabetes disease management and on identification of environmental factors influencing uptake and progression of the disease. He has an active participation in international working groups, in particular the European Innovation Partnership on Active and Healthy Ageing, being also coordinator of the Action Group A1 Prescription and Adherence to medical plans.

prof. Dr. Friedrich Köhler

Head of the Centre for Cardiovascular Telemedicine,
Senior Physician at the Medical Department of Cardiology and Angiology
Charité - Universitätsmedizin Berlin
CCM: Campus Charité Mitte
Centre for Cardiovascular Telemedicine

Prof. Köhler studied medicine at the Humboldt University, Berlin, and received his PhD in 1993 at the University of Surrey, Guildford, UK. He specialized in internal medicine and cardiology, and managed several international projects, including “Improvement of medical care for patients with congenital heart disease in the Baltic States through know-how transfer using modern information technologies” in 2000, "Partnership for the Heart" - development and clinical testing of telecardiological Homecare Systems in 2004 -2011, "Health Region of the Future Northern Brandenburg – Fontane" since 2009, "MAS - Nanoelectropnics for Mobile Ambient Assisted Living (AAL) system" since 2010.

prof. Dr. Ralf Seepold

Prof. Dr. Ralf Seepold is Chair for Ubiquitous Computing at HTWG Konstanz (Germany). Ralf obtained his MSc from the University of Paderborn and his Ph.D. from the University of Tübingen.

He has been working as an Associate Professor for Telecommunication Engineering and Telematics at the University Carlos III of Madrid in Spain. As coordinator and principal researcher he launched the telemedicine project on integrated eHealth and eCare services for residential infrastructures. Ralf initiates the event on Ambient Intelligence for Telemedicine and Automotive domains and the event on Mobile Networks for Biometric Data Analysis. Ralf setup a network for supporting empowerment in rural areas, and he is leader of the project Mobile Sensor Suite Development for Biosignal Data. Recently, the international project SmartSleep has been launched, the objective is to analyze bio vital data, to detect patterns and to derive relationships between a person’s behavior and sleep disorders.

Currently, Ralf is elected leader of the working group on Interfaces of the national cluster initiative for Smart Home & Living and he is main contributor to the general roadmap of this initiative. Ralf is Director of the Ubiquitous Computing Laboratory at HTWG where Biomedical Computing is one core research line. Recent work concentrates on biometric sensors and sensor integration, bio vital signal processing, embedded prototyping platforms and body area networks. He is teaching in three different degrees at HTWG, he is author and co-author of several publications and books, he is coordinator of several ERASMUS agreements and other bilateral research and PhD-cooperation agreements.

Dr. Erez Shalom

Erez Shalom is Medical Informatics Expert and technology leader in the area of medical decision support systems, specializing in knowledge representation, knowledge acquisition, and execution of clinical guidelines. He received his PhD in Information Systems Engineering in 2013 from Ben-Gurion University Of The Negev, Israel.

As a senior researcher at the Medical Informatics Research Center in BGU, he developed the Digital Electronic Guideline Library ("DeGeL"), and since 2012 he works as a work package leader in the FP7 EU MobiGuide Project (http://www.mobiguide-project.eu/), which involves 13 EU partners, and aims to provide continuous patient guidance in non-clinically controlled environments, through mobile interfaces. MobiGuide is currently being evaluated in clinical practice in the domains of Atrial Fibrillation and Gestational Diabetes Mellitus.

In addition, he is involved in many projects in the context of medical decision support systems (DSS) such as developing DSS applications for infection monitoring at the Children's ICU, or DSS applications for remote treatment with telemedicine technology for chronic pain patient, where he tries to help patients with chronic pain to get recommendation and alerts into their mobile.

Erez co-founded healthcare IT start-up, and serves as its CTO since 2012. This start-up combines two systems, one that interprets medical data to clinically meaningful concepts, and one that recommends appropriate medical treatment based on the relevant evidence-based clinical guideline to patients at home via mobile, or to clinical staff at hospital. As a technology leader, since 2006, he is teaching cloud and web-based technologies courses in Ben-Gurion University Of The Negev.

prof. Ron Summers

Ron Summers has worked with complex adaptive systems at the interface of engineering, science and informatics for over 25 years. He is both a Chartered Engineer and a Chartered Scientist. Though his principal application domain is biomedicine, he is also known for his guest lectures on innovation and entrepreneurship gained from personal experience. He has co-founded three companies thus far in his career, one of which employed over 150 people. His research contributions reflect the breadth of opportunities undertaken by working in teams brought together by EU consortia as well those as a consequence of successful bids to a range of national sources of funding. Ron excels in translating findings from research and enterprise into his teaching, updating materials and examples annually to keep himself and his students abreast of leading edge opportunities.

He has held senior academic positions at City University London – in the Department of Systems Science and then the Centre for Measurement and Information in Medicine; and at Loughborough University – where he was Head of Department of Information Science before his move across Faculties to the Department (now School) of Electronic, Electrical, and Systems Engineering in 2008.

Ron has been on the EU expert register since 2002 (EX2002B054772). From 2003 to 2006 he acted as an EU appointed Programme Manager for a telehealth project called 'Doc@home' which was unusual as it comprised only industrial partners. Its successful conclusion was partly put down to his ability to manage a research team within a pre-competitive environment. Ron was also appointed as the external Chair of the Telemedicine and Telehealth Board at Hong Kong Polytechnic

University from 2001 to 2007; he has acted as External Examiner at the University of Lincoln, Leeds Metropolitan University, and City University London (twice) – and on one occasion his face made it to the cover page of their Postgraduate Prospectus! Currently, he acts as an Academic Advisor to the Systems, Technology Management and Environmental Management programmes at the Open University. He has been an active member of the EPSRC Peer Review College since 2006.

Ron takes service to the profession seriously, being a Vice-President of the Institute of Measurement and Control (InstMC) since 2000, with a two year term as President in 2007-8. He is a member of the InstMC Board of Trustees and remains an occasional Chair of both it and Council. He is the current Chair of the InstMC Communications Board and is Editor of the Journal of Measurement and Control. Ron was also a two-term Vice-President of the IEEE Engineering in Medicine and Biology Society (EMBS); and since stepping down in 2003 has held numerous roles to keep his service active. Currently he is Chair of the IEEE EMBS History Committee. Ron chairs Technical Committee 13 (Measurement in Biology and Medicine) within IMEKO (International Measurement Confederation), and helped bring the triennial IMEKO World Congress to Belfast in 2018 and serves on its Organising Committee. His service extends into philanthropy in his role as an Assistant in the Worshipful Company of Scientific Instrument Makers (WCSIM), in which he is an active member of its Education Committee. In his role as Fellow of the Institute of Measurement and Control, Ron is the convener of the Instrumentation Industry Liaison Group, whose membership bridges industry trade associations, academia, the National Physical Laboratory, the National Measurement Office, WCSIM and InstMC, and whose remit is to act as a champion to the sector when interfacing with Government agencies and beyond.

He was awarded with the IEEE Millennium Medal in 2001 for his services and accomplishments in Biomedicine; the WCSIM Bronze Medal for his delivery of the Four Liveries Lecture in 2012, entitled ‘How to mend a broken heart…’; and was awarded the Freedom of the City of London in 2011 as a consequence of being invited to join WCSIM as a Liveryman.

prof. Toshiyo Tamura

Toshiyo Tamura received his BS and MS degrees from Keio University, Japan, in 1971 and 73, respectively and Ph.D. from Tokyo Medical and Dental University in 1980. He is currently a Distinguished Professor, School of Biomedical Engineering, Osaka Electro-Communication University, Japan. He also holds several adjunct positions in universities in Japan and Singapore.

His research interests include biomedical instrumentation, biosignal processing, telemedicine telecare, home care technology and rehabilitation engineering. His research has resulted in over 120 English reviewed articles. His and his colleagues book entitled “Biomedical sensors and instruments” is a popular textbook for bio-instrumentation and medical devices. He also wrote several chapters including sensors for telemedicine and application of wearable inertia sensors.

He is involved regional innovation strategy support program and creates innovations for achieving healthy and long life through the development of health care systems with smart bioinstrumentation and testing He has developed unobtrusive monitoring systems and wearable devices for improving the quality of life

He has served as a chair of IEEE/EMBS Tokyo Chapter in 1996-2000, and the Asian Pacific representative for the EMBS from 2000 to 2004. He was a -president of Japanese Society of Medical Electronics and Biological Engineering in 2010-2012 and a-president of Japanese Society of Life Support Technology in 2009-2011.

prof. May D. Wang

Associate Professor, Georgia Research Alliance Distinguished Cancer Scholar, Director of Biocomputing and Bioinformatics Core in Emory-Georgia Tech Cancer Nanotechnology Center, Co-Director of Georgia Tech Center for Bio-Imaging Mass Spectrometry. Affiliation: Department of Biomedical Engineering, School of Electrical and Computer Engineering, Winship Cancer Institute, Parker H. Petit Institute of Bioengineering and Biosciences, Georgia Institute of Technology and Emory University

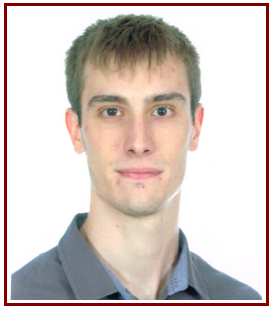
May D. Wang, Ph.D. is an Associate Professor in the Joint Department of Biomedical Engineering of Georgia Tech and Emory and School of Electrical and Computer Engineering of Georgia Tech. She is a Kavli Fellow, a Georgia Research Alliance Distinguished Cancer Scholar, and a Fellow of The American Institute for Biological and Medical Engineering (AIMBE). She serves as Co-Director of Biomedical Informatics Program of Georgia Tech in Atlanta Clinical and Translational Science Institute, Co-Director of Georgia-Tech Center of Bio-Imaging Mass Spectrometry, and Biocomputing and Bioinformatics Core Director in Emory-Georgia-Tech Cancer Nanotechnology Center. She is also with Emory Winship Institute, Georgia Tech IBB and and IPaT.

Prof. Wang's research is in Biomedical Big Data analytics with a focus on Biomedical and Health Informatics (BHI) for Personalized and Predictive Health. Her research includes high throughput NGS and -omic data mining to identify clinical biomarkers, bionanoinformatics, pathological imaging informatics to assist in clinical diagnosis, critical and chronic care informatics for evidence-based decision making, predictive systems modeling to improve health outcome, and delivering informatics solution for telehealth. Dr. Wang is the corresponding/co-corresponding author for peer-reviewed articles published in Proceedings of National Academy of Sciences (PNAS), Annual Review of Medicine, Journal of American Medical Informatics Association (JAMIA), Nature Protocols, BMC Medical Imaging, Journal of Biomedical and Health Informatics (JBHI), Circulation Genetics, Nanomedicine, Journal of Pathology Informatics, IEEE/ACM Transactions on Computational Biology and Bioinformatics (TCBB), Briefings in Bioinformatics, BMC Bioinformatics, Proceedings of The IEEE, IEEE Transactions on Information Technology in Biomedicine (TITB), Annals of BME (ABME), and Trends in Biotechnology etc.

Currently, Prof. Wang serves as the Senior Editor for IEEE Journal of Biomedical and Health Informatics (J-BHI), an Associate Editor for IEEE Transactions on Biomedical Engineering (TBME), and an Emerging Area Editor for Proceedings of National Academy of Science (PNAS). She also serves as IEEE EMBS Biomedical and Health Informatics Technical Committee Chair. She is an IEEE-EMBS 2014-2015 Distinguished Lecturer, and an EMBS Administrative Committee Officer representing North America. In addition, Dr. Wang has devoted to the training of young generation of data scientists and engineers, and is a recipient of Georgia-Tech's Outstanding Faculty Mentor for Undergraduate Research.

Participants


Tomáš Bacigál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Steering Committee of the Summer School:

prof. Metin Akay, University of Houston, USA

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prof. Catherine Garbay, CNRS Grenoble, France

Dr. Fedor Lehocki, NCTS, SUT, Slovakia

prof. Constantina Nikita, NTUA, Greece

prof. Y.T. Zhang, Chinese University of Hong Kong

prof. May D. Wang, Georgia Institute of Technology and Emory University, USA

Organizing Committee:

Dr. Fedor Lehocki, director of National Centre of Telemedicine Services (NCTS) at Slovak University of Technology (SUT), established in cooperation with IBM, WHO Country Office in the Slovak Republic and Slovak Medical Chamber.

He is member of IEEE EMBS and member of Medical Terminology and Health Informatics Standards Center serving as advisory body for Ministry of Health of the Slovak Republic. He is coauthor of the strategic documents for Slovak government related to national eHealth program. His research interests are mainly in the following topics: mHealth, telemedicine technology, systems and services, clinical decision support systems, knowledge modeling, remote monitoring and treatment. In 2006 he initiated a new research theme within Department of Applied Informatics at SUT related to telemonitoring and clinical decision support. He was jointly responsible for twelve research projects in domain of health telematics with funding from academia and industry. Dr. Lehocki is founding Associate Editor of the IEEE Journal of Biomedical and Health Informatics (J-BHI) and was reviewer for Biomedical Engineering Book Series published by the Wiley and IEEE Press. He was chair and organizer of the special session on telehealth systems at IEEE EMBC 2012 conference and served as the program committee member and reviewer for many international conferences in domain of biomedical engineering.

prof. Milan Tyšler, born in 1951 in Prague, director of the Institute of Measurement Science, Slovak Academy of Sciences. He obtained his MS in electrical engineering from Faculty of Electrical Engineering and Informatics, Slovak University of Technology in Bratislava in 1974, PhD in measurement science from the Institute of Measurement Theory, Slovak Academy of Sciences in 1982 and Assoc. prof. from Faculty of Mechanical Engineering, Technical University in Kosice.

He is member of the IEEE Engineering in Medicine and Biology Society, president of the Slovak Society of Biomedical Engineering and Medical Informatics, president of Slovak IMEKO committee and Council member of the International Society of Electrocardiology. He is the organizer and president of several international conferences Measurement, International Congresses on Electrocardiology and member of the Measurement Science Review editorial board.

His main professional interests include research and development of new methods and devices for biosignal measurement and processing and modelling of biological system.