13th IEEE International Conference on BioInformatics and BioEngineering

IEEE BIBE 2013

November 10-13, 2013, Minoa Palace Resort and Spa, Chania, Crete

Title of special session:

The Digital Patient concept: Vision and Early Demonstrations

Aim and objectives:

Medicine is currently undergoing a major revolution that is gradually transforming the nature of healthcare from reactive to preventive. To allow for a gradual adoption of personalised medicine, we need to formulate an open, modular framework of tools and services, including efficient secure sharing and handling of large personalized data sets.

The risk, development and treatment of many major diseases are affected by a great number of individual factors, such as genetic components, age, lifestyle and environment. Often, many of these individual factors exhibit a strong dynamic and temporal nature. Consequently, long-term and consistent data collection of these factors could be particularly useful for supporting individualized prediction and treatment of patients.

The VPH (Virtual Physiological Human) community has set out visions of a new digital representation of the "Digital Patient", which is a "digital me" that contains all my healthcare information, safely managed for access by the various biomedical professionals with my approval, communicated with all my wearable and implanted technology to constantly monitor my health status and informing me, my family and friends, or my healthcare providers of alarming events, supporting the collaboration of various specialists around my complex systemic diseases, and used with all my data to predict the future development of my health in order to facilitate disease prevention and a fully self-aware lifestyle, is a powerful vision. But the challenges are huge.

Hence, Digital Patient should be a life companion of individual citizens that allows access to a comprehensive and consistent set of health status data for the specific individuals over a long history. The data from digital patient will provide an important reference for medical professionals to make personalized clinical decisions. This will strongly encourage the self-engagement of citizens in their own healthcare and enable more "patient-friendly" healthcare services to be developed with enhanced flexibility to address the different individual needs of patients. This complies with the trend to patient-centred healthcare and offers a pathway to enhance the self-awareness of patients and to empower them to play more significant roles in taking care of their own health, which is regarded as an effective way of dealing with the increased challenges anticipated in future healthcare.

As an innovative concept, the impact of digital patient to personalised medicine is yet to be clear and hence requires a focused and concerted effort in addressing various questions regarding:

- User perspectives, use cases and future scenario realising the vision for the "digital patient".

- The power and limitations of modern technologies with respect to their applications to digital patients.
- Clinical acceptability of digital patient in terms of supporting personalised medicine.
- Potential legal and ethical aspects of digital patients

The Special Session will build on experiences as well as technological and scientific developments stemming from some flagship projects funded by the EU under the FP7 framework programme aiming to bring together researches working in the fields of infrastructures and technologies for integrative biomedical research, ICT for predictive and translational medicine and the VPH at large.

Short CV of the organizers:

Feng Dong is Professor of Visual Computing. He joined the Centre for Computer Graphics and Visualisation (CCGV) of the University of Bedfordshire in September 2007 from Brunel University. Prof Dong was awarded a BSc, MSc and PhD from Zhejiang University, where he became a member of academic staff at the State Key Lab of CAD and Computer Graphics, the leading computer graphics lab in China. He has many interests within computer graphics, including medical visualisation, and image processing; his recent work has also developed new areas in texture synthesis, image-based rendering and figure animation. He is the coordinator of the MyHealthAvatar project.

Gordon Clapworthy is Professor of Computer Graphics and Head of Computer Graphics and Visualisation (CCGV) of the University of Bedfordshire. He has a BSc (Hons, Class 1) in Mathematics and a PhD in Aeronautical Engineering from the University of London and an MSc (distinction) in Computer Science from City University. He spent a sabbatical year developing computer animation applications with Electronic Arts. He has produced 200 refereed publications. Recently, his main activity has been the development of novel visualization algorithms for biomedical data.

Manolis Tsiknakis received a B.Eng. degree in Electronic Engineering, a M.Sc. in Microprocessor Engineering, and a Ph.D. in Control Systems Engineering from the University of Bradford, U.K. He is an Associate Professor of Biomedical Informatics at the Technological Educational Institute of Crete and an affiliate researcher at FORTH-ICS, where he has been a Principal Researcher for almost twenty years. His current research interests are in the areas of biomedical informatics, component based software engineering, information integration, ambient intelligence in eHealth and mHealth service platforms and signal processing and analysis. He has a key technical role in both the MyHealthAvatar and p-Medicine projects.

Kostas Marias is a Principal Researcher in ICS-FORTH and was previously a Researcher at the University of Oxford, where he completed his PhD in Medical Image Analysis/ Medical Physics. He was also a senior consulting scientist with the diagnostic software company Mirada Solutions Ltd. (UK), a spin-off from the University of Oxford. He has an MSc in Physical Science and Engineering in Medicine from Imperial College, UK and an Electrical Engineering Diploma from the National Technical University of Athens (NTUA). Currently he is the coordinator of 2 EC projects on cancer modelling (ContraCancrum and Tumor) and is actively involved in providing open access image analysis/modelling tools in the clinical setting for the promotion of predictive oncology. He has published more than 70 papers in international journals and conference proceedings in the above fields.

Norbert Graf is Professor of Paediatrics and Director of the Clinic for Paediatric Oncology and Haematology and a member of the Faculty of Medicine. He is the chairman of the Renal Tumour Study Group of the International Society of Paediatric Oncology (SIOP-RTSG) and the Principal Investigator of the current Trial for Kidney Tumours within SIOP. He is an Associate Member of COG (Children's Oncology Group, North America) and closely cooperating the COG

Renal Study Group. He is the coordinator of P-Medicine. He has more than 25 years of experience with clinical trials.

Contact details of the organizers:

Feng Dong - Feng.Dong@beds.ac.uk

Manolis Tsiknakis - tsiknaki@staff.teicrete.gr