July 5 (Friday), 13:30 – 15:00, Room 1008
Special Session (theme 4)
Organizer - Norbert Graf (Univ. Hospital of the Saarland)
Title - Computational Solutions to Large-Scale Data Management and Analysis in Translational, Personalized and Predictive Medicine

Abstract

Medicine is undergoing a revolution that is transforming the nature of healthcare from reactive to preventive. This is expected to replace our current mode of medicine over the coming years with a personalized and predictive treatment. Our success in addressing these challenges depends on our ability to properly interpret the large-scale, high-dimensional data sets that are generated by modern technologies, since it is becoming increasingly clear that a comprehensive analysis of biological systems requires the integration of all fingerprints of cellular function: genome sequence, maps of gene expression, protein expression, metabolic output, and in vivo enzymatic expression (activity). This need for integration is especially clear in the case of complex, multifactorial diseases, such as cancer. At the same time the Virtual Physiological Human (VPH) framework aims to define methods and technologies that once fully established will enable the investigation of the human body as a whole, eventually leading to a better healthcare system that offers personalized care solutions, a more holistic approach to medicine and a preventative approach to the treatment of disease. Although consensus exists about what the fundamental tools are (integration of high-throughput data from several biologic scales, high-definition imaging, and computational modelling), no such consensus exists as to what are the most promising scientific approaches in responding to these challenges. 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. In addition the Special Session invites original research work in all aspects of Cancer Informatics that support the vision of predictive and personalised medicine in the domain of cancer.

Talks

Introduction to the Topic and the Oncosimulator - Norbert Graf (Univ. Hospital of the Saarland)

Legal Frameworks for Data Sharing from a European Data Protection Perspective - Nikolaus Forgó, Magdalena Góralczyk (Univ. of Hannover)

Employing Novel Imaging Modalities in Developing Modeling Tools for Enabling Personalized Cancer Prediction and Treatment Response - Vangelis Sakkalis (Institute of Computer Science of the Foundation for Research and Technology Hellas)

EURECA and INTEGRATE: Two European Projects Focused on Semantic Interoperability and Information Sharing in Medicine - Anca Bucur (Philips Research Europe)

Trial Outline Builder (TOB) for Visualizing Clinical Trials from Data Entry, Patient Follow-up to Trial Analysis - Yuzuru Tanaka, Jonas Sjøberg (Hokkaido Univ.)