

EJBI pHealth 2019 Special Issue – Editorial

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Editorial

This Special Issue of the European Journal for Biomedical Informatics is dedicated to the pHealth 2019 conference, 10-12 June 2019 in Genoa, Italy. pHealth 2019 was the 16th International Conference on Wearable Micro and Nano Technologies for Personalized Health.

The conference series started in 2003 as a Dissemination Activity of the European Project on Wearable Micro and Nano Technologies for Personalized Health, focusing on personal health management systems. Meanwhile, pHealth conferences are global events, covering technological, biomedical, legal, ethical, social, and organizational requirements and impacts as well as necessary basic research for enabling future-proof care paradigms. So, they address medical services, public health, prevention, social and elderly care, wellness and personal fitness on the move to participatory, predictive, personalized, preventive, precision medicine (5P medicine). Establishing a growing international community, the conferences bring together scientists, developers, and practitioners from various technologies, medical and health disciplines, legal affairs, politics, and administration, representing health services vendor and provider institutions, payer organizations, governmental departments, academic institutions, professional bodies, but also patients and citizens.

pHealth 2019 specifically dealt with artificial intelligence (AI) and machine learning (ML) and their deployment for decision support, thereby considering the advancement of pHealth to P5 medicine and smart systems approaches. In that context, ethical challenges and related international manifests have been deeper discussed.

This EJBI Special Issue presents extended versions of selected contributions to that conference, published in the Studies in Health Technology and Informatics series at IOS Press [B. Blobel and M Giacomini (Eds.) pHealth 2019 – Proceedings of the 16th International Conference on Wearable Micro and Nano Technologies for Personalized Health. Stud Health Technol Inform. 2019; 261]. Angelina Kouroubali et al. address the challenges of personalized stress relief and educational support to patients and their families in the context of elective surgical

interventions. For that purpose, a digital health platform offering virtual reality tools as well as other ICT components, but also interfaces to third-party applications, has been developed to support patients and their relatives during the care pathway. This way, health literacy and digital competence are improved, enabling better self-management and empowerment of patients in their context. Mattias Georgeson investigates the usability assessment of mobile health tools. Usability evaluation is traditionally performed using the expert-based cognitive walkthrough or the user-based think aloud methodology. Cognitive load and method acceptance differ among the evaluators. Therefore, the NASA RTLX instrument for assessing those factors in addition to the number of usability problems and the system Usability scores. For enhancing the objectivity of usability assessments, the described aspects must be included in the assessment process. Hamid Gholam Hosseini et al. present a mobile application for obesity risk assessment, the measurement of activity levels and recommendations for exercising and optimized calorie plans. In addition to user-reported data, the rule-based and self-learning algorithm deploys data from sensors, wearable or medical devices. Solmaz Rastegar et al. developed a methodology for estimating systolic blood pressure from electrocardiograms and photo plethysmography signals, using deep convolutional neural networks. The methodology allows reasonably correct the systolic blood pressure estimation using either preprocessed or raw electrocardiogram and photo plethysmography signals. For managing the problem of care in an aging society, sensors and wearables within the framework of the Internet of Things (IoT) are used. Lenka Lhotska and Jiri Petnik tackle the representation challenge of data from various, vendor-specific, ambient sensors in smart home environments including detection and evaluation algorithms to enable ambient assisted living (AAL). In that context, the authors propose a systems architecture for managing the aforementioned challenges. The different components address a) the management of the data sources, b) the data processing from data acquisition up to persistence management, c) the system logic including data visualization, business logic, notification engine and communication, and d) the end user with his/her applications. The theoretical approach was tested in practice. Georgy Kopanitsa et al. present a study over Russian

patients experiencing an echocardiographic examination. They analyzed records from many patients using machine learning to improve the diagnostic quality. The solution supports doctors in interpreting echocardiography, so allowing to use this diagnostic method for screening. Sara Mora et al. from the University of Genoa in cooperation with some medical doctors of the Galliera Hospital in Genoa developed a web-based platform to assess the effects of HIV on the management of chronic diseases and the quality of life as well as cognitive functions of elderly patients. The necessary pseudonymous data were collected using the European SELFY MPI questionnaire individually filled in by patients and linked to laboratory exam results, so allowing the medical staff to analyze the frailty of elderly HIV patients and to optimize their care.

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