Guest Editors' Introduction

Personalized Digital Health

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It's our honor to serve as guest editors of this special issue of Continuous Digital Health. In overseeing this special issue, our goal is to showcase recent advances in wireless, connected, and mobile health research as a multidisciplinary area, spanning computer science and engineering, nursing, medicine, behavioral science, and public health.

It's an exciting time to take part in this field of study — we're witnessing a major transformation in the way that we deal with our health, not only because mobile Internet technology has made it possible to have continuous access to personal health information, but also because breaking the trend of ever-growing healthcare costs is increasingly necessary. To reduce costs, the way healthcare is delivered must change. In addition, individuals need empowerment to change their health behavior.

With changes now taking place in personalized health technology at the system and individual levels, such technology lets healthcare service providers deliver care to a larger group of people using the same or often fewer healthcare professionals. Individuals who want to take better control of their health invest in technology for tracking their health.

Smartphones play a large role in this transformation. Estimates indicate that more than 70 percent of the world population will have a smartphone by 2017. Connectivity, interoperability, sensing, and instant feedback through smartphones all provide new opportunities for gaining insights into our health behavior. Such insights help us understand and improve what motivates people to make healthy changes throughout their lifetimes. Internet technology not only lets us continuously monitor an individual's physiological and psychological state, but also allows for building up a lifelong record of physical, mental, and social health.

Thus, this special issue discusses several important research areas that play a role in bringing continuous digital health to the next level. Interoperability at different levels in the healthcare delivery chain must be specified, and barriers identified. Without good insight into the requirements and obstacles, the necessary changes to healthcare delivery can't materialize. To facilitate individuals reaching their personalized health goals, such as a healthy physical activity level, there are many health-promoting applications available for smartphones. The biggest challenge, however, is making these applications personalized to deliver effective support for behavioral change. Beyond promoting a healthy lifestyle, further on the horizon is the need to understand the impact of continuous digital health technology on people's quality of life. These areas — ranging from interoperability, personalized mobile applications, and quality-of-life considerations — all drive the digital health space's boundaries forward.

In This Issue

To represent such innovation, we present three high-quality contributions that discuss a range of views on Continuous Digital Health: sustainable interoperable eHealth for primary care, prevention with physical activity promotion, and quality-of-life technologies.

In the first article, "Requirements for and Barriers Toward Sustainable Interoperable eHealth Technology in Primary Care", Wendy Oude Nijeweme-d'Hollosy and her colleagues address the requirements of healthcare in terms of IT technologies and the barriers to implement them in existing health environments. They highlight the complexity of interoperability and the need for close cooperation among different stakeholders to achieve interoperable health technology in primary care.

Next, in "Encouraging Physical Activity via a Personalized Mobile System", Michel C.A. Klein and his colleagues address the issue of physical activity promotion. They identify the shortcomings of existing physical activity apps and present Active2gether, a system that uses modern smartphone technology and wearable sensors to help users set their own goals and then give them personal coaching. In detailing how the system works, they also describe the challenges of building such a system.

Finally, in the third article, "Quality of Life Technologies: Experiences from the Field and Key Research Challenges", Katarzyna Wac and her colleagues discuss quality-of-life technologies, their applications, and key challenges. They conclude that the field is still fragmented and, whereas developments for noncritical, limited scope cases (such as activity tracking) are technologically feasible, more transdisciplinary efforts are needed to approach quality of life holistically.

With several high-quality submissions, it was a challenge to select which papers were the best to include in this special issue. We thank the reviewers for their thorough and thoughtful assessments, and we hope you enjoy reading

the issue.

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A transformation is underway regarding how we deal with our health, not only because mobile Internet technology has made it possible to have continuous access to personal health information, but also because breaking the trend of ever-growing healthcare costs is increasingly necessary. Connectivity, interoperability, sensing, and instant feedback through smartphones all provide new opportunities for gaining insights into our health behavior. Such insights improve our understanding of what motivates people to make healthier changes throughout their lifetimes. Thus, this special issue reviews and shares advances in wireless, connected, and mobile health research that expand the possibilities.

personalized digital health, Internet/Web technologies, eHealth, mobile health research