Editorial

Christopher J. James

“Longer term monitoring through wearables brings with it the promise of predicting the onset of disease – moving from managing illness to maintaining wellness.”

Wearable technology is impacting our daily lives. It is set to transform the way in which healthcare is delivered and will revolutionise the way in which we all go about living our lives healthier for longer. Wearable healthcare technology relies on a juxtaposition of developments on many fronts. These include (but are not limited to): making electronics smaller, faster and lower power; making batteries last longer between charges and quicker to charge – as well as smaller and lighter; and building in high bandwidth communication and powerful on-board intelligence. Such technology is capable of producing very large amounts of data, and this brings about the need to process this data offline, and most probably in real-time, in order to extract meaningful information on health and wellbeing.

Quite apart from the technological innovations being undertaken in the infrastructure for wearables, new discoveries in the way technology interacts with the human body and how information is sensed in new and exciting ways, play a major part in this revolution. Wearables using kinematic sensors, dermal sensors, and implantables, are now all playing a strong role in monitoring conditions long-term. Together, unprecedented amounts of detailed information on, for example, chronic conditions are being generated, allowing for the management of conditions away from the clinic, empowering the wearers to self-manage in a way never available before.

Finally, wearable healthcare technology is also providing information to clinicians such that not only are conditions being better managed, but we are able to learn about the efficacy of treatments, the effects of technology on rehabilitation, and to learn more about the conditions themselves. Longer term monitoring through wearables brings with it the promise of predicting the onset of disease – moving from managing illness to maintaining wellness.

This special issue brings together work across these many facets of wearable healthcare technology and gives a snapshot of some of the latest research in this area. First in this issue is an introduction to the field by Dr Hadas Lewy from Maccabi Healthcare Services in Israel: a researcher with a strong track record of researching and applying digital technologies to improve health and well-being.

Her paper "Wearable technologies – future challenges for implementation in healthcare services" gives a very neat summary of the possibilities and opportunities that wearable healthcare technology provides and the challenges presented by taking this technology to real world solutions. The other papers in this special issue include topics such as the use of social media to improve well-being; the use of smart RFID 'tags' to sense adverse conditions (diaper moisture in this instance); activity monitoring for behaviour through the use of a smart watch (a growing trend in the wearables market); ambulatory platforms to assess gait and heart rate (the latter through novel acoustic sensors); energy harvesting for wearable sensors; heart rate measurements under robust measurement conditions and wireless sensors to measure range of motion in upper and lower extremity joints. I hope that you enjoy reading this special issue in which the challenges I mentioned earlier of how to make wearables smaller, lighter, consume less power, and more accurate are examined through a range of different technologies and applications.

Christopher J. James
Editor-in-Chief
University of Warwick, UK