

Editorial

Ambient Assisted Living for Improvement of Health and Quality of Life—A Special Issue of the Journal of *Informatics*

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The demographic change with respect to the ageing of the population has been a worldwide trend. As a direct result, it has been recognised as causing substantial social transformation in the 21st century [1]. By 2050, the number of people over the age of 65 is estimated to be more than double the number in 2015, with the figure predicted to reach close to 2.1 billion worldwide [1]. As a result, there is increased demand for the optimised provision of health systems and care delivery services. One potential solution to this problem is through Ambient Assisted Living (AAL). AAL aims to use Information and Communications Technology to offer new applications, products, services and systems to address the health and well-being needs of an ageing population. With the introduction of such a paradigm, the desired effect is a positive impact on the quality of life, the management of health conditions and improvements in overall wellbeing, whilst, at the same time, reducing the costs of healthcare provision. With the increasing prevalence of technology in everyday lives, AAL solutions aim to offer support in the home environment, in the community and in the work environment, and involve a wide range of the disciplines including data analytics, smart environments, sensor networks, wearable and pervasive computing and information security.

Despite the potential benefits of AAL solutions, the uptake and widespread deployment is still far from being mature. There are a number of factors contributing to this lack of maturity, for example, strict data and privacy regulations, unestablished business models and integration with existing practice [2]. In addition to the aforementioned issues, the evaluation of AAL solutions in real environments requires significant attention to provide compelling supporting rationale for its uptake. This can be coupled with the requirements for the standardisation of the development of AAL solutions. Furthermore, there is a lack of effort being directed towards addressing the changing needs of healthcare professionals and/or of carers.

In an attempt to encourage research efforts to address these challenges, this Special Issue welcomed submissions on the recent advances in the research, design, development, and evaluation of AAL solutions in the support of improving the health and quality of life of the ageing population. Here we briefly present the contributions to this Special Issue from the different perspectives and attempted challenges which have been reported.

In the literature, relatively few studies have reported the effects of AAL on health outcomes [3]. In this special issue, the paper entitled “Ambient Assisted Living and Health-Related Outcomes—A Systematic Literature Review” provides a review on how the AAL technologies, products and services have performed, with assessment being based on health-related outcomes, i.e., quality of life, in addition to the measurement of clinical parameters. The review provides a valuable

introduction to the area and a starting point for anyone interested in understanding the state-of-the-art of AAL solutions, specifically from the perspective of their influence on the health conditions of the ageing population.

Stakeholders of the AAL ecosystem include health professionals, formal carers, and also family members [4]. The paper entitled “Medical and Para-Medical Personnel’s Perspectives on Home Health Care Technology” presents the findings from an engagement with a focus group of medical and para-medical personnel that investigated their perspective on home healthcare technologies and their impact on the clinical outcomes of users. The study conducted highlighted a number of areas to be further addressed, including the benefit and need for multidisciplinary teams in the AAL development including the involvement of healthcare professionals in requirement gathering, design and evaluation; the need for evaluation of clinical outcomes and the cost-effectiveness of long-term care and matters related to market penetration and adoption of AAL solutions.

Social engagement is a key aspect with respect to the quality of life. Improved social interaction is recognised as having a positive impact on an ageing person’s overall wellbeing. The paper entitled “Development and Evaluation of a Mobile Application Suite for Enhancing the Social Inclusion and Well-Being of Seniors” presents the details of a solution that offers services to support the needs of the ageing, including enhanced social engagement. The authors believe that the knowledge and understanding shared in the paper relating to the fundamental steps required in the development of well-being solutions will benefit other researchers developing their own applications.

The final contribution in this Special Issue details a research study into sleep activities. It is estimated that one third of the population are not obtaining an adequate amount of sleep. Lack of sleep increases the risk of a range of health issues, for example obesity, heart disease and mental health [5]. There has been an increased emphasis and effort directed towards the development of technology solutions to assist with sleep monitoring. One of the major barriers, though, for the long-term benefit of these solutions/devices is the issue of sustained engagement. The paper entitled “Thermal Signature Based Sleep Analysis Sensor” proposes a non-invasive method for classifying sleep stages based on temperature monitoring. The paper reports a potential use for this approach in the screening of sleep disorders.

Although the development of AAL solutions has evolved rapidly over the past decade, it is still considered to be a relatively new area, requiring further efforts from a multidisciplinary perspective in order to progress, mature and come into widespread usage. The editors hope that this Special Issue provides a starting point for those who are interested in embarking on research activities within this domain, whilst providing for those already working in the field, a refreshed and updated perspective on recent developments.

Conflicts of Interest: The authors declare no conflict of interest.

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