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EDITORIAL
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Editorial: Enhancing Quality of Life in Ambient Spaces

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Editorial on the Research Topic

Enhancing Quality of Life in Ambient Spaces

INTRODUCTION

The focus of this Research Topic was on ways in which digital technologies can be used within ambient spaces to enhance the lives of the people living, working, traveling, or in other ways experiencing those places. This is clearly a very broad Research Topic, inspired by technological developments, including sensor-based devices and ambient displays (e.g., Wisneski et al., 1998), often combined with AI techniques for machine learning about user behaviors (e.g., Jafarinaimi et al., 2005), which are proliferating in a wide variety of physical and social settings (Streitz et al., 2003; Kim et al., 2010). Ambiently available technologies provide numerous possibilities for the design and creation of adaptive spaces in buildings, homes, vehicles, urban spaces, and other forms of human-building interaction (Alavi et al., 2019). These have the potential to make life easier, safer, and more enjoyable for their users, and may be specifically designed for therapeutic or assistive purposes.

Both Quality of Life and Ambient Spaces were interpreted broadly by the authors in this Research Topic. Ambient Spaces constitute a wide variety of possible situations in which a person's surrounding environment senses them and responds to their presence and/or state. There is considerable scope for design innovations that bring together components of these two Research Topic areas in the creation of humane places and spaces in improving quality of life through design. There are also a range of ethical and security issues that challenge and constrain this emerging design area.

ACCEPTED PAPERS

Four full-length papers have been included in this Research Topic after peer review. The paper by Margariti et al. aimed at understanding the experiences of remote workers during the application of COVID-19 travel restrictions. It addresses the lack of a detailed understanding of domestic workplaces in terms of their experiential dimensions and associated challenges to wellbeing. A small-scale study was conducted over a period of 4 weeks of continuous home working. The study reported quantitative and qualitative analyses of occupant experiences, using sensor wristbands, self-reported mood changes, and recording of environmental aspects. Based on their results, the authors discuss the impact of feedback mechanisms in the domestic workplace on the wellbeing and behavior of remote workers. They also outline a design agenda for future use of ambient technologies to support the wellbeing of remote workers. This kind of research is important because remote collaboration is likely to be a significant aspect of future working life, even in times when working remotely is not required as a means of infection control.

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Adopting a Virtual Reality (VR) approach, Gamberini, Bettelli et al. address another Research Topic of widespread and growing importance, that of the safety and wellbeing of the public at large in the face of natural disasters, focusing particularly on flood situations. Although VR has frequently been used for training and education about how to behave in emergency situations, this study examines the question of how to design VR to provide relevant and effective social and psychological cues to citizens at such times. Multiple stakeholders contributed to the creation of convincing virtual scenarios, leading to the derivation of design requirements and strategies to improve quality of life and psychological wellbeing in risk-exposed citizens. This work is highly relevant as river floods are highly threatening climate events which are likely to become ever more frequent due to climate change. Furthermore, similar techniques should be equally relevant for other disaster situations.

The third paper, also by Gamberini, Pluchino et al., looks at how the Internet of Things (IoT) can be deployed to provide non-pharmaceutical interventions for the safety of living environments in a time of social (physical) isolation. The paper presents plans for the SAFE PLACE project, which will exploit cutting-edge IoT systems and Artificial Intelligence to support healthy and safe living environments tailored to living requirements during the COVID-19 epidemic. The outcomes of the project are expected to provide detailed information about how to exploit advanced IoT technologies and Artificial Intelligence to deal with this and future health crises, thereby reducing the impact of those crises on healthcare systems.

In the fourth and final paper, Bacchin et al. address the important Research Topic of how living spaces can be designed better to meet the needs, and improve the quality of life, of the millions of people with motor and cognitive disabilities who face hardships in daily life due to the limited accessibility and inclusiveness of their current living spaces. As described by Bacchin et al., the DOMHO project aims to improve this situation by creating a smart home equipped with a series of home automated and intelligent technologies. The paper focuses on an analysis of test participant interactions with the system control application to be deployed in the project, based on video data, interviews, and a questionnaire. The authors anticipate that this preliminary work may lay the foundations for user-centered design of IoT systems that provide supportive living spaces for people with disabilities. This important work is expected to break down architectural barriers and improve the social lives of disabled people, helping to reduce social isolation and feelings of loneliness and helplessness.

CONCLUSION

Potential impacts of designed ambient spaces are large and growing and we hope that this Research Topic will stimulate more research in this important field in future. Human wellbeing is constrained, to a considerable extent, by the buildings and environments in which we live and work, and as technology progresses there are increasing opportunities to design ambient spaces that promote, rather than restrict, our quality of life.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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