Guest Editorial:
Special Issue on Serious Games for Health

SERIOUS games have been applied for nearly two decades in several domains of health and healthcare. During this period, we witnessed the creation of several conferences, providing a forum to discuss and share knowledge, experiences, and scientific and technical results, related to state-of-the-art solutions and technologies on serious games and applications for health and healthcare. The growth of computational capacity, development of new forms of interaction with the user (patient), and theoretical foundations produced by the scientific community over the past few years have now made it possible and viable to develop solutions, based on serious games, to face real problems. The possibility to create scenarios for medical training and simulation, the use of video games in rehabilitation procedures in an extrahospital environment, and the engagement provided by forms of teaching based on video games are just some examples of how this technology can be used. This special issue aims to highlight some of the high-quality research produced in the field of serious games applied to health.

This special issue gathers eight papers, selected from the received submissions, for their merit and valuable contribution.

Baranyi *et al.* in the article "Analysis, design, and prototypical implementation of a serious game *Reha@Stroke* to support rehabilitation of stroke patients with the help of a mobile phone" propose an innovative serious game that relies only on the integrated sensors of a smartphone to capture the patient movements. The article also focuses on the development methodology (user-centered design) and the game mechanics.

In the article "Fammeal: A gamified mobile application for parents and children to help healthcare centers treat childhood obesity," Afonso *et al.* present a mobile application with tailored recommendations for parents regarding young children's lifestyles, such as eating, drinking, exercise, and sleeping habits. The proposed approach intends to achieve two different target audiences: Parents, by including gamification mechanics in the App; and children aged 3–6 years, through serious games.

Wilcocks *et al.* present in the article "The anesthesia crisis scenario builder for authoring anesthesia crisis-based simulations" a framework that provides medical professionals the opportunity to create new anesthesia-based virtual simulations (scenarios) following the steps found in *The Anaesthetic Crisis Manual*. The proposed tool eases the creation of simulated practices by providing an on-screen graphical user interface. The framework is able to generate a virtual simulated room that can be deployed to a computer or played in a VR headset.

In their article "Staying motivated during difficult times: A snapshot of serious games for paediatric cancer patients," Abd Majid *et al.* present a summary of existing studies that focus on serious games for pediatric cancer patients that undergo treatment in hospital. Out of 422 articles preliminarily identified through database search, 13 articles are selected for inclusion. The review confirms positive effects of serious games for pediatric cancer patients and provides key guidelines to help future game design processes.

Healthcare solutions involve interactions among different types of people, both healthcare professionals and patients plus their relatives, etc. In the article "User-centered design of a scenario-based serious game: Game-based teaching of future healthcare," Schulz *et al.* aim at development of a scenario-based serious game to teach about such solutions. Their game prototypes, through user-testing sessions, reveal various issues with the game's concept and technical implementation.

Laine *et al.* propose in the article "A distributed multiplayer game to promote active transport at workplaces: User-centered design, implementation, and lessons learned" a distributed, collaborative, and competitive game for promoting active transport at workplaces. The article also analyzes how the proposed serious game supports the eight core drives of gamification, and presented 17 lessons learned in four categories.

In the article "Correlating psychophysiological responses of exergaming boxing for predictive heart rate regression models in young adults," findings by Mohd Jai *et al.* reveal that for young adults, there is a significant correlation between heart rate (HR) and rating of perceived exertion (RPE) values while playing boxing exergaming in a standing position. The resulting model can be used to predict HR based on available RPE reports. Limitation of their work and future suggestions are given.

In the article "Impact of using active locomotion interfaces for gameplay: A study on exertion levels and presence," Gray *et al.* present a study that compares active locomotion interfaces against traditional game controllers, regarding the promotion of physical activity. The study revealed that active locomotion interfaces contribute to an increase in heart rate and respiratory rate and had a significant impact on player subjective presence.

All the aforementioned articles present innovative solutions in the field of serious games for health. We hope you will enjoy reading this special issue and that it provides you with the inspiration to achieve your goals.

Finally, we would like to thank all the authors for their contributions to this special issue. A special thanks to the reviewers for their timely and valuable input.

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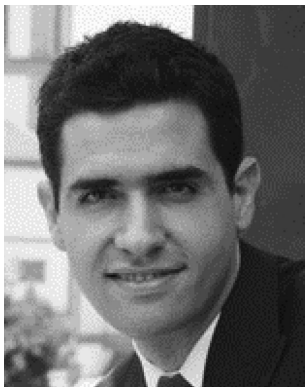
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