Guest Editorial Preface

Special Issue on Emerging Trends, Issues and Challenges in Healthcare Solutions

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This special issue on "Emerging Trends, Issues and Challenges in Healthcare Solutions" contains extended versions of selected papers presented at three different conferences, namely the 6th World Conference on Information Systems and Technologies (WorldCIST'18), 7th World Conference on Information Systems and Technologies (WorldCIST'19), and 7th International Conference on Information Technology & Systems (ICITS'19).

The selected papers are contributions such as research papers, case studies, and demonstrations that present original scientific results, methodological aspects, concepts, and approaches in the multidisciplinary field of reliable innovative solutions applied to healthcare, as well as related issues and challenges.

It intends to be a manuscript where researchers, practitioners, and industry representatives present and discuss ongoing work and latest research results of meaningful contributes on enabling technologies and emerging topics regarding reliable innovative solutions applied to healthcare for enhancing human quality of life, as well as related issues and challenges. It also aims to cover several dimensions of the original research as regarding to theoretical, methodological, and technological developments, and new applications. Therefore, the main goal of this special issue is to contribute to the development of new approaches and reliable enabling technologies that will enhance human quality of life, leading to healthier, innovative, and secure societies.

The modern health industry has evolved rapidly to the fifth stage (Health 5.0), with a particular focus on digitalization and personalization. More than treating health problems, it is important to prevent and avoid problems from occurring. Healthcare will be quickly less important face to well-being.

Interoperability, monitoring and control play an important role in the production of Systems for Health 5.0 as well as Artificial Intelligence, as there are insufficient financial and human resources to implement such systems (Cardoso et al. 2014; Peixoto et al. 2012; Salazar et al. 2013). It is clear that ethical issues and problems related to privacy and the protection of personal data become more important and will receive much attention in the near future (Neves et al. 2018).

The topics discussed in this special issue include (but are not limited to) Artificial Intelligence Systems, Augmented Reality, Business Intelligence applied to Healthcare Information Systems, Clinical Decision Support Systems, Healthcare Information Systems, Interoperability, Security and Efficiency, and Pervasive Healthcare.

This special issue contains five different scientific papers.

The first paper focuses on the initial steps of the implementation of an openEHR system in a major Portuguese healthcare provider – Centro Hospitalar do Porto (CHP). In all components presented in this approach, the mapping of the current systems in the healthcare institution is guaranteed. The system comprises the creation of operational templates through a validation mechanism, a platform for data generation dynamically constructed from templates, and an interoperability mechanism through the implementation of an HL7 V3/CDA message system.

After the analysis of the problems in the visualization process of the exams in CHP, the second paper emphases on the development of a new platform – AIDA - MCDT, whose main objective was to fill the gaps verified, making the access to exams' results more efficient and intuitive. This platform

has significantly improved the system's usability, including several features designed to help health professionals make decisions more quickly and securely.

The third paper proposes the monitoring and maintenance of the web service processes that occur in CHP through an intuitive and user-friendly platform developed in ReactJS. These processes are responsible for critical tasks within the hospital. Thus, the daily control of its activities ensures that there are no unnecessary failures, supporting an efficient healthcare delivery. The development of the application followed the Design Science Research methodology and was submitted to a Strengths Weaknesses Opportunities and Threats analysis which results were considered optimistic.

In the fourth paper, a data mining process is performed with medical data available, in order to evaluate how the scoring systems perform when trying to predict mortality and patients' state complication. Furthermore, the presented paper studies the two scoring systems presented to define which one outperforms the other. On one hand, PULP scoring allowed a better mortality prediction achieving above 90% of accuracy. On the other hand, regarding complications, Boey system achieved better results leading to a better prediction when it comes to predicting patients' state complication.

Finally, the ageing of the population increases the number of elders dependent in self-care. Thus, being dependent in a home context is a fact that deserves attention from social support entities integrated into the community, such as nursing homes, which play a central role in supporting the families involved. In this sense, the last study is aimed at seniors dependent in self-care, their informal caregivers, and health professionals from Portuguese nursing homes and emerged to assist elders' self-care and their informal caregivers and to strengthen the communication strategies between the different elements of the target audience. Therefore, the fifth paper addresses the design and development of an archetype of a new system, which main objectives are to accompany, teach, and share information between its users, taking into account safe medical validation and ethical issues, through emerging health ICT technologies. This archetype is a reinforcement, that is, a way to promote and complete the knowledge and skills to deal with elders' well-being and health, as well as their informal caregivers' welfare.

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José Machado is an Associate Professor with Habilitation in the Department of Informatics, School of Engineering, University of Minho. He has been at the University of Minho since 1988. He got his PhD in Computer Science in 2002 and Habilitation in 2011. He is director of the Algoritmi R&D Center of the School of Engineering of the University of Minho since 2017. He is the former Associate Director of Algoritmi (2016-17). He is a founding member and former header of Algoritmi's "Computer Science and Technology" research line and he is founder and header of Algoritmi's "Knowledge Engineering" group. ALGORITMI Research Center, is one of the largest national centers recognized by the Foundation for Science and Technology in the area of TICE, having more than 500 members in January 2018 (206 PhD researchers), most of whom are career professors from the 4 departments of the School of Engineering of the University of Minho.