

Guest Editorial Preface

Special Issue on the Future of Healthcare: New Methodologies, Technologies, and Applications based on Modeling and Simulation

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Healthcare is an open and huge research field involving researchers and practitioners from multidisciplinary domains. Hence, when dealing with healthcare breakthroughs a wide and complex framework is referred: medical advances are just one of the many facets of a rather complex and intertwined research field where usually disparate contributions feed into. Although patient therapy remains the primary process as well as the mission of each medical institution, other side effects are receiving increasing attention.

Due to the increased demand for medical services and resources scarcity, the need for effective tools and approaches involves patient care processes and ancillary as well as support services such as management, organizational and technical practices. Like corporate organizations, healthcare facilities are called to be effective and efficient more than ever. This is the reason why, there are several attempts to let healthcare organizations and processes benefit from the latest developments in engineering and technology.

Having this in mind, the Special Issue on “The future of Healthcare: new Methodologies, Technologies and Applications based on Modeling & Simulation” strives to provide actual and forward-looking approaches that could contribute to shaping a new vision as well as new paradigms in the healthcare domain. On the other hand, the inner complexity of healthcare processes, jointly with several and conflicting constraints no way negligible, offers interesting food for thoughts and challenges researchers with issues whose solution may bring about relevant high impact contributions.

To this end, this special issue encompasses highly original research works that are quite different in nature and scope. The works that are part of this special issue, indeed, consider:

- High level organizational aspects such as the need for an efficient and goal-oriented work organization;
- The compulsory requirement for accurate and robust hazard and risk assessment tools;
- Advanced CFD analysis for highly specific problems such as perfusion during the extracorporeal membrane oxygenation;
- New techniques for medical images processing;
- Original approaches for surgery training

The variety of covered topics and proposed approaches clearly highlights that Healthcare is a breeding ground for challenging engineering approaches where even well-established methodologies

and approaches (i.e. FMECA, Lean Management, CFD, Modeling and Simulation) could lead to new high-impact solutions. Furthermore, the value of each research work is also in the capability to provide a balanced mix between methodology and application amplifying the impact of each contribution.

Hoping that this Special Issue could be deemed a valuable resource for all its readers and will, in turn stimulate further research, I would like to express all my gratitude to everybody who has been involved in it. My sincere thanks go to all those people that have supported and contributed to this Special Issue especially the IJPHIM Editorial Board as well as all the authors and reviewers.

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Francesco Longo received his PhD in Mechanical Engineering from University of Calabria in January 2006. He is currently Assistant Professor Director of the Modeling & Simulation Center – Laboratory of Enterprise Solutions (MSC-LES), a research laboratory operating at the Department of Mechanical, Energy and Management Engineering of University of Calabria. Starting from 2016 he is also serving as CEO of CAL-TEK Srl, a Spin-off company of University of Calabria. His research interests include Modeling & Simulation for production systems design and supply chain management for supporting decision making processes and education/training. He has published more than 150 scientific papers on international conferences and journals participating as speaker and chairman to different international conferences. He participated as advisor to ICAMES from 2004 to 2015 (International Cultural and Academic Meeting of Engineering Students, in Istanbul). He actively cooperates with many research institutions all over the world, including DIPTTEM, University of Genoa, Kennedy Space Center, NASA (Cape Canaveral, USA), University of Ottawa (Canada), Rutgers University (The State University of New Jersey) among others. He is Associate Editor of Simulation: Transaction of the society for Modeling & Simulation International. and Guest Editor for different journals' Special Issues. He is member of the International Program Committees of the most important conferences in the Simulation field: Program Chair of Summer Simulation Multiconference (2012 and 2013), Vice General Chair of Summer Simulation Multiconference (SummerSim2011), General Co-Chair of the European Modeling & Simulation Symposium (EMSS 2008-2017), General Chair of the International Conference on Modeling & Applied Simulation (MAS 2009, 2010), Program Chair of the International Multidisciplinary Modeling & Simulation Multi-conference (2007 and 2008, 2011-2017).