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IFIP is the global non-profit federation of societies of ICT professionals that aims at achieving a worldwide professional and socially responsible development and application of information and communication technologies.

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The flagship event is the IFIP World Computer Congress, at which both invited and contributed papers are presented. Contributed papers are rigorously refereed and the rejection rate is high.

As with the Congress, participation in the open conferences is open to all and papers may be invited or submitted. Again, submitted papers are stringently refereed.

The working conferences are structured differently. They are usually run by a working group and attendance is generally smaller and occasionally by invitation only. Their purpose is to create an atmosphere conducive to innovation and development. Refereeing is also rigorous and papers are subjected to extensive group discussion.

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Luis M. Camarinha-Matos · Mafalda Parreira-Rocha
Javaneh Ramezani (Eds.)

Technological Innovation for Smart Systems

8th IFIP WG 5.5/SOCOLNET
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Proceedings

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Preface

This volume of the proceedings of the **Advanced Doctoral Conference on Computing, Electrical and Industrial Systems (DoCEIS) 2017** presents a series of selected articles produced in the context of engineering doctoral programs. The theme was “Technological Innovation for Smart Systems” and contributions reflect the growing interests in research, development, and application of smart systems. The rapid evolution in smart sensors, actuators, and embedded intelligence technology and its seamless integration into multiple system architecture and platforms have revolutionized the technological world, and even the way we live, since the last decade. The pervasive nature of this technology has enabled rapid permeation into all facets and levels of engineering disciplines and has earned immense attention and focus not only within academic circles and research communities worldwide, but also in the practical applications development.

Potential benefits can be found in all engineering fields and at all levels, e.g., supporting systems-of-systems, facilitating the industrial Internet and networked enterprises, enabling effective smart energy grids, creating the basis for smart environments, etc. A “smart systems” approach can change the way engineering systems are designed and operated while leading to exciting challenges for researchers and industrial practitioners. Smart systems are undeniably the technology of the future, with unparalleled possibilities, hence the need to further explore and exploit its prospects.

DoCEIS is aimed as an international forum providing a platform for the presentation of research results generated in PhD works, and a space for discussion of post-graduate studies, PhD thesis plans, and practical aspects of a PhD work and results from doctoral research in these inter-related areas of engineering, while promoting a strong multi-disciplinary dialog. As such, participants were challenged to look beyond their specific research question and relate their work to the selected theme of the conference, namely, to identify in which ways their research topics can benefit from, or contribute to, smart systems-based solutions.

A basis for innovation nowadays is to embrace the application of multi-disciplinary and interdisciplinary approaches in the context of research. In fact, more and more funding agencies are including this element as a key requirement in their funded programs. As such, the challenge put forward by the DoCEIS series of conferences to its authors can be seen as a contribution to the process of acquiring such skills, which are mandatory in the profession of a PhD.

This eighth edition of DoCEIS, which was sponsored by SOCOLNET, IFIP WG5.5, and IEEE IES, attracted a considerable number of paper submissions from a large number of PhD students and their supervisors from 23 countries. This book comprises the works selected by the international Program Committee for inclusion in the main program and covers a wide spectrum of application domains. As such, research results and on-going work are presented, illustrated, and discussed in areas such as:

- Collaborative networks
- Computational intelligence
- Systems analysis
- Smart manufacturing systems
- Smart sensorial systems
- Embedded and real-time systems
- Energy management
- Energy optimization
- Distributed infrastructure
- Solar energy
- Electrical machines
- Power electronics
- Electronics

As anticipated, and confirmed by the submissions, it is shown that virtually any research topic in this broad engineering area can either benefit from a smart systems perspective, or be a direct contributor with models, approaches, and technologies for further development of such systems.

We expect that this book will provide readers with an inspiring set of promising ideas and new challenges, presented in a multi-disciplinary context, and that by their diversity these results can trigger and motivate richer research and development directions.

We would like to thank all the authors for their contributions. We also appreciate the efforts and dedication of the DoCEIS international Program Committee members, who both helped with the selection of articles and contributed with valuable comments to improve their quality.

February 2017

Luis M. Camarinha-Matos
Mafalda Parreira-Rocha
Javaneh Ramezani

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The 8th IFIP/SOCOLNET Advanced Doctoral Conference on Computing, Electrical, and Industrial Systems was held in Costa de Caparica, Portugal, during May 3–5, 2017.

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