Preface

This 2016 edition of the DoCEIS proceedings book presents a series of selected articles produced in the context of engineering doctoral programs. The theme is on "Technological Innovation for Cyber-Physical Systems" and contributions reflect the growing interests in research, development, and application of cyber-physical systems. Fast progress on embedded intelligence and interconnection of systems, enabled by advances in pervasive computing, sensing technologies, and computer networks, including developments in the Internet of Things and cloud computing, have led to new architectural approaches to systems engineering. By exploring the synergies between computational and physical components, these systems leverage the emerging "network effect" and induce new advanced applications.

Potential benefits can be found in all engineering fields and at all levels, e.g., supporting systems-of-systems, facilitating the industrial Internet and sensing enterprise, enabling effective smart energy grids, creating the basis for smart environments, etc. This approach can change the way engineering systems are designed while leading to exciting challenges for researchers and industrial practitioners.

DoCEIS is an international forum providing a platform for the presentation of research results from PhD work, and a space for the discussion of post-graduation studies, PhD thesis plans, and practical aspects of PhD work 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, cyber-physical-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 calls for proposals. As such, the challenge put forward by DoCEIS 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 seventh edition of DoCEIS, which is sponsored by SOCOLNET, IFIP, and IEEE IES, attracted a considerable number of paper submissions from a large number of PhD students and their supervisors from 24 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. Research results and on-going work are presented, illustrated, and discussed in areas such as:

- Enterprise collaborative networks
- Ontologies
- Petri nets
- Manufacturing systems
- Biomedical applications
- Intelligent environments

- – Control and fault tolerance
- – Optimization and decision support
- – Wireless technologies
- – Energy: smart grids, renewables, management, and optimization
- – Bio-energy
- – 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 cyber-physical 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.

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