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IFIP was founded in 1960 under the auspices of UNESCO, following the first World Computer Congress held in Paris the previous year. A federation for societies working in information processing, IFIP's aim is two-fold: to support information processing in the countries of its members and to encourage technology transfer to developing nations. As its mission statement clearly states:

> *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.*

IFIP is a non-profit-making organization, run almost solely by 2500 volunteers. It operates through a number of technical committees and working groups, which organize events and publications. IFIP's events range from large international open conferences to working conferences and local seminars.

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.

Publications arising from IFIP events vary. The papers presented at the IFIP World Computer Congress and at open conferences are published as conference proceedings, while the results of the working conferences are often published as collections of selected and edited papers.

IFIP distinguishes three types of institutional membership: Country Representative Members, Members at Large, and Associate Members. The type of organization that can apply for membership is a wide variety and includes national or international societies of individual computer scientists/ICT professionals, associations or federations of such societies, government institutions/government related organizations, national or international research institutes or consortia, universities, academies of sciences, companies, national or international associations or federations of companies.

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Luis M. Camarinha-Matos · Kankam O. Adu-Kankam
Mohammad Julashokri (Eds.)

Technological Innovation for Resilient Systems

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Preface

This proceeding book, which collects selected results produced in engineering doctoral programs, focuses on research and development on resilient systems. There is a growing need for development and integration of resilience into technological systems owing to the increased rate of disruptive events around the globe. Such events are due to a variety of causes, e.g., globalization, natural hazards and climate change, economic crisis, demographic shifts, fast technological evolution, cyber-attacks, rise of nationalisms, to name a few, and they challenge the way systems are designed, implemented, and managed. Subsequently, their adverse impact on lives and property are immeasurable. It is also evident that these occurrences are becoming widespread and highly pervasive. Furthermore, rapid advances in smart sensors, actuators, embedded intelligence, and their seamless integration into multiple systems architecture and platforms have revolutionized the technological world, and even the way we live. However, the pervasive nature and growing complexity of these technologies have also subjected our world to high levels of vulnerabilities, which pose a big threat to human existence. It is therefore a matter of necessity and undeniable urgency for the research community to take proactive and pragmatic actions by exploring new ways and measures to mitigate these emerging global problems.

The DoCEIS series of advanced Doctoral Conferences on Computing, Electrical and Industrial Systems aims at creating a space for sharing and discussing ideas and results from doctoral research in these inter-related areas of engineering, while promoting a strong multidisciplinary 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 resilient systems. Current trends in strategic research programs are confirming the fundamental role of multidisciplinary and interdisciplinary approaches in innovation. More and more funding agencies are including this element as a key requirement in their calls for proposals. In this way, the "exercise" requested by DoCEIS can be seen as a contribution to the process of acquiring such skills, which are mandatory in the profession of a PhD.

The ninth edition of DoCEIS, which was sponsored by SOCOLNET, IFIP, and IEEE IES, attracted a good number of paper submissions from a large number of PhD students and their supervisors from 21 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 systems
- Decision support systems
- Supervision systems
- Energy management
- Smart grids

- Sensing systems
- Electrical systems
- Simulation and analysis
- Monitoring systems
- Energy distribution systems

We expect that this book will provide readers with an inspiring set of promising ideas and new challenges, presented in a multidisciplinary 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 2018

Luis M. Camarinha-Matos
Kankam O. Adu-Kankam
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9th IFIP/SOCOLNET Advanced Doctoral Conference on Computing, Electrical and Industrial Systems
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