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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. An umbrella organization for societies working in information processing, IFIP's aim is two-fold: to support information processing within its member countries and to encourage technology transfer to developing nations. As its mission statement clearly states,

IFIP's mission is to be the leading, truly international, apolitical organization which encourages and assists in the development, exploitation and application of information technology for the benefit of all people.

IFIP is a non-profitmaking organization, run almost solely by 2500 volunteers. It operates through a number of technical committees, which organize events and publications. IFIP's events range from an international congress to local seminars, but the most important are:

- The IFIP World Computer Congress, held every second year;
- Open conferences;
- Working conferences.

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 small and 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.

Any national society whose primary activity is about information processing may apply to become a full member of IFIP, although full membership is restricted to one society per country. Full members are entitled to vote at the annual General Assembly, National societies preferring a less committed involvement may apply for associate or corresponding membership. Associate members enjoy the same benefits as full members, but without voting rights. Corresponding members are not represented in IFIP bodies. Affiliated membership is open to non-national societies, and individual and honorary membership schemes are also offered.

Luis M. Camarinha-Matos Nuno S. Barrento
Ricardo Mendonça (Eds.)

Technological Innovation for Collective Awareness Systems

5th IFIP WG 5.5/SOCOLNET Doctoral Conference on
Computing, Electrical and Industrial Systems, DoCEIS 2014
Costa de Caparica, Portugal, April 7-9, 2014
Proceedings



Springer

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Preface

This proceeding book, which collects relevant research results produced in engineering doctoral programs, focuses on socio-technical systems capable of extensive sensing and multi-source, multi-modal information processing; harnessing collective intelligence for promoting innovation; and taking good, informed, and sustainability-oriented decisions: collective awareness systems. These systems leverage the ubiquitous computing and "network effect" by combining open social media, distributed knowledge creation, and data acquisition from real environments ("Internet of Things"), thus linking objects, people, and knowledge in order to foster new forms of social and business innovation.

Although typical PhD students are not experienced researchers, but rather in the process of learning how to do research, observation of worldwide publications shows that a high number of technologically innovative ideas are produced in the early careers of researchers. The DoCEIS series of 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. Innovative ideas and hypothesis can be better enhanced when presented and discussed in an encouraging and open environment. DoCEIS aims to provide such an environment, releasing PhD students from the pressure of presenting their propositions in more formal contexts.

The fifth edition of DoCEIS, which was sponsored by SOCOLNET and IFIP, attracted a considerable number of paper submissions from a large number of PhD students (and their supervisors) from 22 countries. This book comprises the works selected by the International Program Committee for inclusion in the main program and covers a wide spectrum of topics, ranging from collaborative networks to microelectronics. As such, research results and on-going work are presented, illustrated, and discussed in areas such as:

- Collaborative Networks
- Computational Systems and Human-Computer Interfaces
- Self-organizing Manufacturing Systems
- Manufacturing and Supervision
- Robotics and Mechatronics
- Embedded Systems and Petri Nets
- Energy Systems and Smart Grid
- Monitoring and Optimization in Energy
- Electronics and Telecommunications

Focusing on the main theme of the conference, and as a gluing element, all authors were asked to explicitly indicate the (potential) contribution of their work to the collective awareness systems. The idea was not to "deviate students' attention" from their core research. The core of each paper was aimed to be

defined around the PhD research topic and the innovative contributions that such research brings to each specific area. Nevertheless, it was also anticipated, and confirmed by the submissions, that virtually any research topic in this broad engineering area could either benefit from a collective awareness systems perspective, or being a direct contributor with models, approaches, and technologies for further development of such systems.

On the other hand, researchers are increasingly requested to be able to “position” their research in a wider scope and establish links with other disciplines. More and more funding agencies are requiring research proposals to include an element of multi-disciplinarity. Therefore, this “exercise” requested by DoCEIS can be seen as part of the process of acquiring such skills, which are mandatory in the profession of a PhD.

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 will 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 Program Committee members who both helped with the selection of articles and contributed with valuable comments to improve their quality.

February 2014

Luis M. Camarinha-Matos
Nuno Silvério Barrento
Ricardo Mendonça

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5th IFIP/SOCOLNET Doctoral Conference on
COMPUTING, ELECTRICAL AND INDUSTRIAL
SYSTEMS

2014 Costa de Caparica, Portugal, April 7–9, 2014

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