IFIP AICT 574

Augusto Casaca
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(Eds.)

Internet of Things

A Confluence of Many Disciplines

Second IFIP International Cross-Domain Conference, IFIPIoT 2019
Tampa, FL, USA, October 31 – November 1, 2019
Revised Selected Papers

Springer

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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.*

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.

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Preface

"To connect the unconnected," is the overarching goal of Internet of Things (IoT), an ongoing technology transition. It has great promise to revolutionize the way humans will live on this planet. IoT technology has vast scope and touches every aspect of human life, such as, healthcare, transportation, city living, work life, sustainability, etc. The IFIP Domain Committee on IoT organized the Second IFIP Internet of Things (IoT) conference in Tampa, Florida, which took place during October 31 – November 1, 2019.

The IoT Technical Program Committee consisted of 34 members from 13 countries who considered 22 submissions for the second edition of this conference. Each paper was on average refereed by three reviewers, using the single-blind review principle. In total, 11 papers were selected for presentation resulting in an acceptance rate of 50%. This book contains the revised versions of the refereed papers presented at the conference. The papers were selected on the basis of originality, quality, and relevance to the topic. As expected, the peer-reviewed papers covered a wide array of topics such as self-driving cars, smart buildings, e-health, patient self-monitoring, irrigation management, hybrid context reasoning, hardware security, social-science discourse on IoT research, and edge node processing requirements. The attendees coming from such diverse disciplines had great interaction during the presentation of the technical papers.

Besides peer-reviewed papers, the conference featured 12 invited talks from leading researchers and thought leaders in the IoT space. The invited talks covered topics such as energy constrained inference on distributed IoT edge nodes, adiabatic and low energy IoT edge computing, AI and IoT Security, AI and communications, V2X communication security, edge devices for foolproof detection of fall of adults, IoT security hands-on laboratory, IoT curriculum design of first Bachelor's degree in IoT in the USA, and smart grid. This book includes eight papers from invited speakers. The table of contents indicates which papers were invited talks.

The conference featured two keynote speakers. The first keynote was given by Prof. Marilyn Wolf, Chair of Computer Science and Engineering Department at University of Nebraska-Lincoln, USA. Prof. Wolf's talk entitled "The Case of Edge Intelligence" presented and motivated with various IoT application scenario examples the need for machine learning (ML) on the edge and how ML can be implemented on the edge. The second keynote was given by Prof. Swarup Bhunia, Director of Warren B. Nelms Institute for the Connected World, University of Florida, USA. Prof. Bhunia presented the IoT vision of the Nelms Institute as well as ongoing research on global problems related to critical safety, security, and sustainability.

A panel entitled "AI and IoT" was held and moderated by Mr. Leon Strous. It had three panelists, namely, Prof. Swarup Bhunia (University of Florida, USA), Prof. Kwang-Cheng Chen (University of South Florida, USA), and Mr. Pete Nicoletti (Cybraics, USA). The panel started with the question "Are we intelligent enough to

optimize the potential of IoT or do we need AI" and touched upon various topics such as the need for AI in the IoT, how AI can play a critical role in IoT security, etc.

A PhD student forum was held with the intent of providing feedback by the IoT experts in the conference audience to the doctoral students working in the IoT space. A total of 13 PhD posters were presented by students from five universities and three countries. The student research topics included IoT security, IoT edge processor design, smart transportation, light-weight cryptography for IoT communications, Internet of Medical Things (IoMT), smart grid, edge device for automatic stress detection and control, etc.

Both the panel outcome and the PhD posters are not included in this book but we emphasize that these were valuable parts of the program that generated good discussions.

We thank the authors, the Program Committee, and the participants for their hard work and contributions and look forward to their continued involvement.

We feel that all the contributions make the book a rich volume in the IFIP AICT series and we trust and hope that the reader will be inspired by it.

January 2020

Augusto Casaca
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