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Massila Kamalrudin · Sabrina Ahmad
Naveed Ikram (Eds.)

Requirements Engineering for Internet of Things

4th Asia-Pacific Symposium, APRES 2017 Melaka, Malaysia, November 9–10, 2017 Proceedings

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Editors
Massila Kamalrudin
Universiti Teknikal Malaysia Melaka
Melaka
Malaysia

Sabrina Ahmad
Universiti Teknikal Malaysia Melaka
Melaka
Malaysia

Naveed Ikram
Riphah International University
Islamabad
Pakistan

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Preface

Requirements Engineering (RE) is now a well-established discipline of research and practice in software and systems development. The importance of developing and following effective RE practices has long been recognized by researchers and practitioners alike. In the Asia–Pacific region, RE is also receiving more and more attention due to the increasing reliance on software-intensive systems.

The Asia-Pacific Requirements Engineering Symposium (APRES) is a focused intellectual forum for in-depth discussion of all issues related to RE. It aims to bring together researchers and practitioners from industry, academia, and government to share the state of the art and practice in RE and explore emerging challenges in RE innovation. It also aims to foster collaboration among the RE community of researchers and practitioners in Asia and Oceania. Following the success of APRES 2014 in New Zealand, APRES 2015 in China, and APRES 2016 in Japan, the fourth edition of APRES (APRES 2017) took place in Malaysia, specifically in Melaka the historical city of Malaysia.

Responding to the growing trend toward interconnectivity, the discussion at APRES 2017 addressed the changing work practices and challenges of RE in response to the Internet of Things (IoT). This year, we accepted 11 full papers and five short papers. All papers were carefully reviewed by at least three Program Committee members and detailed constructive feedback was provided to the authors. We also had participants and presentations from Australia, Malaysia, Pakistan, Japan and Korea.

APRES 2017 was held for two days during November 9–10, 2017. The symposium hosted two keynote speakers who each presented a topic relevant to the current development of RE. The first speaker, Professor Didar Zowghi from Australia, highlighted the sociotechnical perspectives in RE, while the second speaker, Professor Madhusudan Singh from Korea, discussed Blockchain Technology in RE. Both topics are relevant to the changing work practice and research in RE.

The paper presentations at APRES 2017 were organized into five main topics, i.e., big data, cyber security, crowd-sourcing, automation, and requirements challenges. APRES 2017 also attracted a good number of participants and enriched the overall offering of the conference for the discussions of real-world problems and sharing of industry experiences and practices in RE.

Our greatest thanks go to the authors and presenters whose contributions made APRES 2017 a success. We are grateful to the Program Committee members for their thorough and timely reviews of the submissions. We thank the Steering Committee for their valuable guidance.

Our thanks also go to Springer, publisher of the APRES proceedings, for their continuous support. Finally, thanks to EasyChair for making the conference management such an efficient task.

We hope you all enjoy the APRES 2017 proceedings.

November 2017

Massila Kamalrudin
Sabrina Ahmad
Naveed Ikram

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Abstracts of Keynote Talks

Old and New Directions in Requirements Elicitation Research and Practice: A Sociotechnical Perspective

Didar Zowghi

University of Technology Sydney, Australia

Requirements elicitation is the most communication rich and iterative activity in requirements engineering that relies heavily on the skills and the cooperation of all stakeholders. It represents an early but continuous and critical stage in the development of software systems. Requirements are elicited rather than just captured or collected and there are elements of discovery, creativity, emergence, and development in the whole elicitation process. All these diverse elements have presented many challenges for requirements elicitation research, training and practice. In this keynote, I will look at the past and present directions of research and practice in requirements elicitation and highlight the thorniest issues revealed and addressed so far. I will argue that we do not have any real theory that can adequately explain the requirements elicitation process. I will then review some of the important lessons that I have learnt from my two decades of requirements engineering research to posit that ultimately this theory would have to be a "reconciliation of social and technical". I will also speculate a sociotechnical approach that could address the fundamental challenges of requirements elicitation.

Role of Blockchain Technology in Requirement Engineering

Madhusudan Singh

Yonsei Institute of Convergence Technology

In the requirements elicitation phase of requirements gathering, a lot of information is collected and documented from the stakeholders and customers. The information is sometimes miscommunicated due to inconsistency, incompleteness, non-verifiability and difference of opinion among different stakeholders. Every new discussion with customers, and stakeholders brings up new ideas, which is very challenging for the requirements engineer to maintain the consistency and verifiability with the previously recorded information. Neither the customers nor stakeholders account for what they said, what they are saying and what they actually want. Using the systematic manual analysis or an executable model to check requirements is not enough. There is an emergent need of an open transparent and verifiable platform network like blockchain for customers, stakeholders, and requirements engineers for communicating, collaborating and collecting their ideas, thoughts and requirements clearly and coming up to a consensus. This will help requirements engineer to clearly analyse and elicit verifiable, traceable, comprehensible requirements for the system, which can maximally comply with the needs of all the customers and stakeholders involved with the software system. Therefore, Blockchain can play a very important role in requirements engineering domain. The blockchain technology has four key points (Consensus, Cryptography, Smart contract and ledger) they can build the secure distributed and decentralised bond during the requirement engineering process. In this keynote, I will discuss followings:

1. Introduce Requirements Engineering with Blockchain technology.
2. Blockchain based Requirements engineering for software engineering.
3. Blockchain based Security requirements challenges and solution for software engineering.
4. Discuss the blockchain based requirement engineering for emerging technologies (Artificial Technology, IoT, Big data etc.).

Contents

Requirements Challenges

Automation