Studies in Big Data 60

Shiho Kim
Ganesh Chandra Deka *Editors*

Advanced Applications of Blockchain Technology

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Advanced Applications of Blockchain Technology

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Preface

The initial and the most popular application of Blockchain was cryptocurrency. Blockchain technology is likely to revolutionize various domains by providing a secure and fast end-to-end users' transaction without the intervention of any trusted third party or central authorities. Although there are various technical and security threats associated with Blockchain technology, they can be tackled with the novel technology, tools, and frameworks. A holistic and coordinated effort between the government, business, and academia will take Blockchain technology to higher standards. This edited book having 13 chapters contributed by academia, practitioners, and researchers from reputed universities/organizations from various countries deliberates upon the different aspects of Blockchain technology.

Chapter "Introduction to Blockchain and IoT" discusses the technical aspects of Blockchain and IoT. Some of the use cases of the Blockchain technology are also discussed in this chapter. Chapter "IoT, AI, and Blockchain: Implementation Perspectives" presents an implementation perspective of AI, IoT, and Blockchain. Four important Blockchain platforms such as *Bitcoin, Ethereum, Hyperledger*, and *Stellar* are also discussed. Chapter "Blockchain Technologies for IoT" describes the potential benefits and challenges of using Blockchain technology for IoT applications and provides some use case, while Chapter "Blockchain Technology Use Cases" is a list of use cases which could rely on Blockchain and smart contracts, the most potential application of Blockchain technology. Chapter "Blockchain Meets Cybersecurity: Security, Privacy, Challenges and Opportunity" reviews the main IoT security issues associated with the adoption of Blockchain technology. The chapter also presents a comprehensive overview of blockchain as it relates to IoT security. Chapter "On the Role of Blockchain Technology in Internet of Things" *deliberates about the* private Blockchain in terms of scalability in different IoT devices. Chapter "Blockchain of Things (BCoT): The Fusion of Blockchain and IoT Technologies" is a survey on recent research articles and projects/applications on the implementation of the Blockchain for IoT Security and identifies associated challenges. Chapter "Blockchain Architecture" *is about* the issues in designing the Blockchain application development process and to identify the key participants in the Blockchain environments.

Chapter "Authenticating IoT Devices with Blockchain" is about the privacy and security concerns of IoT device authentication and authorization flaws in the heterogeneous deployment. Chapter "Security and Privacy Issues of Blockchain Technology" discusses the security and the privacy of Blockchain along with their impact with regard to different trends and applications. The chapter is intended to discuss key security attacks and the enhancements that will help develop better Blockchain systems. Chapter "Supply Chain Management in Agriculture Using Blockchain and IoT" *discusses the* implementation of a user-friendly Web-based platform in agricultural supply chain management using Blockchain technology to enhance agriculture-based product quality. Chapter "Blockchain Technologies and Artificial Intelligence" *is about* the capabilities of the intersection of AI and Blockchain and also discusses the standard definitions, benefits, and challenges of this alliance. Finally, Chapter "Blockchain Hands on for Developing Genesis Block" discusses the data processing models which are applicable in the Blockchain technology.

We hope the reader of the book will be benefited by it's diverse coverage of topics on Blockchain and IoT.

New Delhi, India — Prof. Shiho Kim
Incheon, Korea (Republic of) — Ganesh Chandra Deka

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Shiho Kim is Professor at the College of Engineering, Yonsei University. He completed his M.S. and Ph.D. at the Department of Electrical Engineering, KAIST and he has more than 15 years of teaching experience. His research interests include intelligent vehicles, virtual reality, reinforcement learning, sensors for wireless environmental monitoring, thermoelectric sensors, thermoelectric power generators, and energy harvesting techniques. He has received the Korean Prime Minister and Presidential award in the International Robot Contest in 2008 and 2010 respectively. He was founder and Head Director of the Research Center for Advanced Hybrid Electric Vehicle Energy Recovery Systems (RAVERS) from 2009 to 2010. He was Chair of Vehicle Electronics Research Group from 2013 to 2014 and IEEE Solid-State Circuit Society Seoul Chapter from 2013 to 2015. Currently, he is Vice-chair of the Korean Institute of Next Generation Computing and has been an IEEE VR standard Advisory Board member since 2018. He has filed numerous patents in his area of research.

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