

Preface

Internet of Things and big data are two sides of the same coin. The advancement of Information Technology (IT) has increased daily leading to connecting the physical objects/devices to the Internet with the ability to identify themselves to other devices. This refers to the Internet of Things (IoT), which also may include other wireless technologies, sensor technologies, or QR codes resulting in massive datasets. This generated big data requires software computational intelligence techniques for data analysis and for keeping, retrieving, storing, and sending the information using a certain type of technology, such as computer, mobile phones, computer networks, and more. Thus, big data holds massive information generated by the IoT technology with the use of IT, which serves a wide range of applications in several domains. The use of big data analytics has grown tremendously in the past few years directing to next generation of intelligence for big data analytics and smart systems. At the same time, the Internet of Things (IoT) has entered the public consciousness, sparking people's imaginations on what a fully connected world can offer. Separately the IoT and big data trends give plenty of reasons for excitement, and combining the two only multiplies the anticipation. The world is running on data now, and pretty soon, the world will become fully immersed in the IoT.

This book involves 21 chapters, including an exhaustive introduction about the Internet-of-Things-based wireless body area network in health care with a brief overview of the IoT functionality and its connotation with the wireless and sensing techniques to implement the required healthcare applications. This is followed by another chapter that discussed the association between wireless sensor networks and the distributed robotics based on mobile sensor networks with reported applications of robotic sensor networks. Afterward, big data analytics was discussed in detail through four chapters. These chapters addressed an in-depth overview of the several commercial and open source tools being used for analyzing big data as well as the key roles of big data in a manufacturing industry, predominantly in the IoT environment. Furthermore, the big data Learning Management System (LMS) has been analyzed for student managing system, knowledge and information, documents, report, and administration purpose. Since business intelligence is considered one of the significant aspects, a chapter that examined open source applications, such as

Pentaho and JasperSoft, processing big data over six databases of diverse sizes is introduced.

Internet-of-Things-based smart life is an innovative research direction that attracts several authors; thus, 10 chapters are included to develop Industrial Internet of Things (IIoT) model using the devices which are already defined in open standard UPoS (Unified Point of Sale) devices in which they included all physical devices, such as sensors printer and scanner leading to advanced IIoT system. In addition, smart manufacturing in the IoT era is introduced to visualize the impact of IoT methodologies, big data, and predictive analytics toward the ceramics production. Another chapter is presented to introduce the home automation system using BASCOM including the components, flow of communication, implementation, and limitations, followed by another chapter that provided a prototype of IoT-based real-time smart street parking system for smart cities. Afterward, three chapters are introduced related to smart irrigation and green cities, where data from the cloud is collected and irrigation-related graph report for future use for farmer can be made to take decision about which crop is to be sown. Smart irrigation analysis as an IoT application is carried out for irrigation remote analysis, while the other chapter presented an analysis of the greening technologies' processes in maintainable development, discovering the principles and roles of G-IoT in the progress of the society to improve the life quality, environment, and economic growth. Then, cloud-based green IoT architecture is designed for smart cities. This is followed by a survey chapter on the IoT toward smart cities and two chapters on big data analytics for smart cities and in Industrial IoT, respectively. Moreover, this book contains another set of 5 chapters that interested with IoT and other selected topics. A proposed system for very high capacity and for secure medical image information embedding scheme to hide Electronic Patient Record imperceptibly of colored medical images as an IoT-driven healthcare setup is introduced including detailed experimentation that proved the efficiency of the proposed system, which is tested by attacks. Thereafter, another practical technique for securing the IoT against side channel attacks is reported. Three selected topics are then introduced to discuss the framework of temporal data stream mining by using incrementally optimized very fast decision forest, to address the problem classifying sentiments and develop the opinion system by combining theories of supervised learning and to introduce a comparative survey of Long-Term Evolution (LTE) technology with Wi-Max and TD-LTE with Wi-Max in 4G using Network Simulator (NS-2) in order to simulate the proposed structure.

This editing book is intended to present the state of the art in research on big data and IoT in several related areas and applications toward smart life based on intelligence techniques. It introduces big data analysis approaches supported by the research efforts with highlighting the challenges as new opening for further research areas. The main objective of this book is to prove the significant valuable role of the big data along with the IoT based on intelligence for smart life in several domains. It embraces inclusive publications in the IoT and big data with security issues, challenges, and related selected topics. Furthermore, this book discovers the technologies impact on home, street, and cities automation toward smart life.

In essence, this outstanding volume cannot be without the innovative contributions of the promising authors to whom we estimate and appreciate their efforts. Furthermore, it is unbelievable to realize this quality without the impact of the respected referees who supported us during the revision and acceptance process of the submitted chapters. Our gratitude is extended to them for their diligence in chapters reviewing. Special estimation is directed to our publisher, Springer, for the infinite prompt support and guidance.

We hope this book introduces capable concepts and outstanding research results to support further development of IoT and big data for smart life toward next-generation intelligence.

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