

Raghvendra Kumar
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Prasant Kumar Pattnaik *Editors*

Multimedia
Technologies in
the Internet of Things
Environment, Volume 2

Studies in Big Data

Volume 93

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Raghvendra Kumar · Rohit Sharma ·
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Editors

Multimedia Technologies in the Internet of Things Environment, Volume 2

 Springer

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Preface

The main objective of this book publication is to explore the concepts of Internet of Things, biomedical, and cyber-physical systems along with the recent research and development. It also includes various real-time applications and case studies in the field of engineering and technologies used. As populations grow and resources become scarcer, the efficient usage of these limited goods becomes more important.

Chapter “[An Overview of Multimedia Technologies in Current Era of Internet of Things \(IoT\)](#)” gives an insight into the use of cryptographic schemes along with some automated watermarking techniques. Watermarking has not been a recent phenomenon except in the area of protection for distributed digital data for quite a few years, but in the past, it has not been discussed and not mentioned for its robustness, trust, and imperceptibility in all forms of media.

Chapter “[A Deeper Look into Wind-Powered IoT Based Sustainable Organic Compost Machine](#)” analyzes the distribution of wind power across the states of India and puts forth the benefits of wind-powered IoT-based sustainable organic compost machine to the Indian agriculture.

Chapter “[An Intelligent Music Recommendation Framework for Multimedia Big Data: A Journey of Entertainment Industry](#)” proposed a hybridized algorithm, namely particle swarm optimization-based crow search algorithm, for music recommendation system. The proposed model performed statistical analysis for a real data set and took into account the most recent as well as past ratings of the users.

Chapter “[A Survey on Multimedia Technology and Internet of Things](#)” provides a survey work of IoT, and then, we discuss its characteristics. After that the author shall discuss different issues involved with each of these fields. Multimedia data generated by IoT system are very huge in size and needs a lot of bandwidth to communicate from one system to another.

Chapter “[The Latest Emerging Technologies in Big Data](#)” suggests a structure, which consist of two primary components, namely data analysis and data transmission. Constantly, streaming heterogeneous sensors input data that show different characteristics of the train gear is attained by an IoT data managing device. Within the onboard IoT data management module, primarily, all incoming data are handled and categorized into two groups: maintenance critical data and maintenance non-critical data.

Chapter “[Realtime Accident Detection and Alarm Generation System Over IoT](#)” presented a model, which is based on IoT devices that can sense and predict the pre-accident/pre-collision state and generates an alarm message about the collision is going to occur. This model is designed to extract image/video features to determine the possibility of occurrence of a collision. This model is also efficient for post-collision.

Chapter “[Smart Automobile Health Monitoring System](#)” presents the role of artificial intelligence (AI), machine learning (ML), and the Internet of things (IoT) in automobile monitoring specifically for fuel efficiency monitoring, air inflation monitoring, and suspension adjustment. Further, various kinds of existing technologies recently developed regarding suspension adjustment monitoring, fuel-efficiency monitoring, and air inflation monitoring have been discussed.

Chapter “[Fault Detection and Data Management for IIoT](#)” implemented an efficient SELF-TEL architecture which is based on fog for an industrial scenario which can detect and classify the sensor faults with less delay and data loss. The developed method provided better accuracy when tested with the existing machine learning algorithms. An effective method for data management, namely delay-aware concurrent data management (DCDM), was developed for mobile edge computing environment (MEC) which can categorize the requests generated and the data at the edge layer by implementing optimization based on request density and timeout.

Chapter “[Theoretical and Instructional Aspects of Using Multimedia Resources in Language Education: A Cognitive View](#)” aims to provide a set of theoretical frameworks and a realistic planning structure designed to inform the planning and design of more efficient digital content integration into language teaching and learning contexts. Based on the cognitive linguistics view supported with dual coding and cognitive load theory, the chapter critically reviews and presents the differences in the way verbal and visual representations represent knowledge for language learners.

Chapter “[Data Mining Techniques for Producing Clustering in Big Data with MapReduce Function](#)” mainly focused on challenges of big data, how to extract the required data from large volume of data, and also various clustering algorithm. For the extraction of data, MapReduce function is used which is mainly used in Google search engine.

Chapter “[Machine Learning Techniques for Biometric Fingerprint Recognition Using the Magnitudes to Provide Privacy and Integrity](#)” will check for advanced alternatives that will replace the less secure ancient methods of logging into computers. The benefits of using this technology in aging secrecy, tokens, or open-end credit technology will appear a lot and obvious and will set the stage for facing the security and authentication challenges of the twenty-first century.

Chapter “[Study and Develop an Effective Interfaces to Upload Data into Enterprise Resource Planning System](#)” proposed a target-based data transformation. The proposed work performs an efficient data transfer between source and designation system and ensures data transfer without any loss and with proper validation based on designation system data model.

The aim of this book is to support the computational studies at the research and postgraduation level with open problem-solving technique; we are confident that it

will bridge the gap for them by supporting novel solution to support in their problem solving. At the end, editors have taken utmost care while finalizing the chapter to the book, but we are open to receive your constructive feedback, which will enable us to carry out necessary points in our forthcoming books.

Gunupur, India
Ghaziabad, India
Bhubaneswar, India

Raghvendra Kumar
Rohit Sharma
Prasant Kumar Pattnaik

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An Overview of Multimedia Technologies in Current Era of Internet of Things (IoT)



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Abstract Throughout the digital era of internet of things, various forms of media such as email, audio, picture, and video have been able to reach the network arena. Reasons behind this include easier data transmission and storage over a longer span of time, and this is amply assisted by the vast cheap availability of services such as large frequencies. This progression has raised numerous difficulties contradicting the previous' prosperity. One of the most testing issues is the absence of security of the information. Numerous strategies in computerized watermarking were created as and when required, to counter this test, yet one single methodology that would take care of the security issues for all the media types has neglected to exist till now. We have recommended a few strategies which fulfill the previously mentioned need. They are spread range watermarking, non-disavowal absent watermarking, and assault portrayal. The main strategy is tied in with inserting the watermark in any indispensable areas of the archive so that watermark can't be evacuated subtly, while the subsequent one proposes watermarking plans for information dispersion and the last technique improves the strength of the watermark by portraying the assault utilizing reference watermark.

Keywords Cryptography · Database Security · Metadata · Multimedia Filters · Multimedia Information · Multimedia Processing · Relational Databases · Watermarking

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