

Algorithms for Intelligent Systems

Series Editors: Jagdish Chand Bansal · Kusum Deep · Atulya K. Nagar

Uma N. Dulhare

Essam Halim Houssein *Editors*

# Machine Learning and Metaheuristics: Methods and Analysis

 Springer

# **Algorithms for Intelligent Systems**

## **Series Editors**

Jagdish Chand Bansal, Department of Mathematics, South Asian University,  
New Delhi, Delhi, India

Kusum Deep, Department of Mathematics, Indian Institute of Technology Roorkee,  
Roorkee, Uttarakhand, India

Atulya K. Nagar, School of Mathematics, Computer Science and Engineering,  
Liverpool Hope University, Liverpool, UK

Uma N. Dulhare · Essam Halim Houssein  
Editors

# Machine Learning and Metaheuristics: Methods and Analysis

 Springer

*Editors*

Uma N. Dulhare  
Muffakham Jah College of Engineering  
and Technology  
Hyderabad, Telangana, India

Essam Halim Houssein  
Faculty of Computers and Information  
Minia University  
Minia, Egypt

ISSN 2524-7565                      ISSN 2524-7573 (electronic)  
Algorithms for Intelligent Systems  
ISBN 978-981-99-6644-8              ISBN 978-981-99-6645-5 (eBook)  
<https://doi.org/10.1007/978-981-99-6645-5>

© The Editor(s) (if applicable) and The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd. 2023

This work is subject to copyright. All rights are solely and exclusively licensed by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors, and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Singapore Pte Ltd. The registered company address is: 152 Beach Road, #21-01/04 Gateway East, Singapore 189721, Singapore

Paper in this product is recyclable.

## Chapter 9

# Artificial Intelligence-Based Internet of Things Security



Ramesh Chandra Goswami, Hiren Joshi, and Sunil Gautam

**Abstract** Internet of Things (IoT) is a network of interconnected, web-connected devices that can collect and transmit data across a wireless network without requiring human contact. People feel more at ease and relieved as a result of the Internet of Things. IoT devices give users the freedom to produce reports without constraints and access information even in remote locations. Additionally, they accurately direct people with wise judgements using communication technologies, as was already mentioned. Preprocessing is necessary since many linked devices gather a lot of raw sensed data. However, it only becomes something important since IoT devices require sufficient resources for edge computing. The essential tools for information inference in edge computing are AI-based algorithms. Additionally, the sensed data gathered by IoT applications is typically unstructured and requires further analysis, where AI-based models assist in extracting pertinent data. Additionally, there is a possibility for malicious attacks when data is transmitted from device to device. The use of Artificial Intelligence (AI) approaches to improve the security of Internet of Things (IoT) systems is explored in this chapter.

**Keywords** Internet of Things · Artificial intelligence · IoT protocols · Security and privacy · Intrusion detection systems

---

R. C. Goswami (✉)  
Kadi Sarva Vishwavidyalaya, Gandhinagar, India  
e-mail: [rameshd4@gmail.com](mailto:rameshd4@gmail.com)

H. Joshi  
Gujarat University, Ahmedabad, India  
e-mail: [hdjoshi@gujaratuniversity.ac.in](mailto:hdjoshi@gujaratuniversity.ac.in)

S. Gautam  
Department of Computer Science and Engineering, Institute of Technology, Nirma University,  
Ahmedabad, India  
e-mail: [gautamsunil.cmri@gmail.com](mailto:gautamsunil.cmri@gmail.com)

© The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd. 2023  
U. N. Dulhare and E. H. Houssein (eds.), *Machine Learning and Metaheuristics: Methods and Analysis*, Algorithms for Intelligent Systems,  
[https://doi.org/10.1007/978-981-99-6645-5\\_9](https://doi.org/10.1007/978-981-99-6645-5_9)

199