

# Creative Approaches Towards Development of Computing and Multidisciplinary IT Solutions for Society



*Edited By*

Anchit Bijalwan,

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## Preface

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This book provides an insightful look at creative approaches toward the development of computing and multidisciplinary IT solutions for society. The exponential advancement of information technology is evident in almost all spheres of modern life. The subjects of IoT, cloud computing, network communication, creative processes, and artificial intelligence (AI) have enormous impacts on our daily lives. Smart houses, smart classrooms, AI in education, the application of satellite communications in space technologies, the use of image processing and AI in all professions, and application of this new technology in banking services are some examples how IT has gradually become an indispensable part of our life. Currently, AI, cyber security, and machine learning are being used to support decision making, gain insight into new techniques for the future of games, discover new creative and innovative approaches, and more. Therefore, this book covers all niche areas related to AI.

Covering seven different themes, this volume will help researchers and professionals to improve their understanding of the subject matter and will provide academicians with cutting-edge information to better deliver quality education. The first theme concerns the emerging research into next-generation computing like cloud computing, cyber security, and gaming. This theme spans nine chapters.

Chapter 1 concerns the deployment of virtual desktop infrastructure to open-source platforms for higher education. The second chapter explains how to enhance intrusion detection effectiveness through an enhanced hierarchical communication architecture. Chapter 3 outlines enhanced SDN security using mobile agents. The fourth chapter delves into the implications of Emagnet and Pastebin in cybersecurity.

Chapter 5 illustrates how to mitigate the threat of multi-factor authentication using evilginx2. The sixth chapter looks into the implementation of a rule-based DDoS solution in SDN. Chapter 7 covers the hybrid encryption technique for securing communication in unsecured physical media. The eighth chapter explores a robust authentication technique for client-server

secure login, and Chapter 9 focuses on a web-based food ordering platform to minimize waste and prevent theft.

The book's second theme pertains to IT in the textile industry, and it spans two Chapters 10 and 11. Chapter 10 shows a research design database for material inventory management in the garment industry, whereas the eleventh chapter is about a research design and machine maintenance management software module for the garment industry.

The third theme explores the adoption of ICT for digitalization, artificial intelligence, and machine learning, and this section contains eight chapters. Chapter 12 considers the performance comparison of predicting a hydraulic jump depth in a channel by using various machine learning models. The thirteenth chapter shows how to create a video from a facial image by using a conditional generative adversarial network. Chapter 14 concerns a deep-learning framework for detecting, classifying, and recognizing invoice metadata.

Chapter 15 shows the artificial neural network-based approach for molecules' bitter prediction. The sixteenth chapter addresses efficiency improvement of the n-beats model for the sale forecast problem. Chapter 17 reviews a generative pre-trained transformer for **answering** Vietnamese community-based COVID-19 questions. The eighteenth chapter deals with the identification and classification of plant leaf diseases using data augmentation and deep convolutional neural networks, and Chapter 19 concludes the theme with a tourists' perception of technology adoption in the tourism industry and innovative strategies for integration.

The fourth theme addresses online collaboration in the creative process and contains three chapters. Chapter 20 is about increasing the security of pseudorandom sequences that are used for 5G systems by generating very large pn-sequences with a linear shift register (hardware\_oriented languages, D\_transformation). The twenty-first chapter demonstrates how to navigate the digital information flow that influences the Internet and the choice of technology in creative processes of interactive art. Chapter 22 delves into the reconceptualization of the learning space using adaptive models.

Spanning five chapters, the book's fifth theme covers the development of computing and multidisciplinary ICT solutions for salient disciplines like education, governance, commerce, and business communication. Chapter 23 focuses on loan credit prediction using the deep learning approach. The twenty-fourth chapter pertains to reviewing user interface design and usability in information systems. Chapter 25 shows RobotGPT, which is a voice-based robot that is integrated with edge computing technology. The twenty-sixth chapter addresses peer-to-peer electricity trading, and a business solution based on blockchain for developing renewable energy

in Vietnam. Chapter 27 shows how to digitize data from the shirt-sewing technology process.

Security assessment and defense strategies for banking and financial institutions is the sixth theme, which contains three chapters. Chapter 28 is an analysis of the precondition for the introduction of a central bank digital currency and some recommendations for central banks. The twenty-ninth chapter is about efficient face mask detection for banking information systems. Chapter 30 is about corporate governance policies and practices, with special reference to private sector firms in Vietnam.

The seventh theme covers creative approaches towards implementation of the 4IR, and it contains four chapters. Chapter 31 is about leveraging BIM technology for design appraisal and fire safety management on construction sites in Vietnam. The thirty-second chapter delves into assessing a smart cities' feasibility and promoting intelligence in Vietnam's urban system. Chapter 33 digs into the design and implementation of a secured enterprise network infrastructure. Finally, the last chapter pertains to research and the development of platform software for building Web SCADA applications.

We are deeply grateful to everyone who helped with this book and greatly appreciate the dedicated support and valuable assistance rendered by Martin Scrivener and the Scrivener Publishing team during its publication.

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