

**SpringerBriefs in Applied Sciences
and Technology**

SpringerBriefs present concise summaries of cutting-edge research and practical applications across a wide spectrum of fields. Featuring compact volumes of 50 to 125 pages, the series covers a range of content from professional to academic.

Typical publications can be:

- A timely report of state-of-the art methods
- An introduction to or a manual for the application of mathematical or computer techniques
- A bridge between new research results, as published in journal articles
- A snapshot of a hot or emerging topic
- An in-depth case study
- A presentation of core concepts that students must understand in order to make independent contributions

SpringerBriefs are characterized by fast, global electronic dissemination, standard publishing contracts, standardized manuscript preparation and formatting guidelines, and expedited production schedules.

On the one hand, **SpringerBriefs in Applied Sciences and Technology** are devoted to the publication of fundamentals and applications within the different classical engineering disciplines as well as in interdisciplinary fields that recently emerged between these areas. On the other hand, as the boundary separating fundamental research and applied technology is more and more dissolving, this series is particularly open to trans-disciplinary topics between fundamental science and engineering.

Indexed by EI-Compendex, SCOPUS and Springerlink.

Azman Ismail · Fatin Nur Zulkipli ·
Mohd Amran Mohd Daril · Andreas Öchsner
Editors

Applied Problems Solved by Information Technology and Software

 Springer

Editors

Azman Ismail
Centre for Women Advancement
and Leadership
Universiti Kuala Lumpur, Malaysian
Institute of Marine Engineering Technology
Lumut, Perak, Malaysia

Mohd Amran Mohd Daril
Malaysian Institute of Industrial
Technology
Universiti Kuala Lumpur
Masai, Johor, Malaysia

Fatin Nur Zulkipli
College of Computing, Informatics
and Mathematics
Universiti Teknologi MARA
Machang, Kelantan, Malaysia

Andreas Öchsner
Faculty of Mechanical Engineering
Esslingen University of Applied Sciences
Esslingen am Neckar, Baden-Württemberg,
Germany

ISSN 2191-530X ISSN 2191-5318 (electronic)
SpringerBriefs in Applied Sciences and Technology
ISBN 978-3-031-47726-3 ISBN 978-3-031-47727-0 (eBook)
<https://doi.org/10.1007/978-3-031-47727-0>

© The Editor(s) (if applicable) and The Author(s), under exclusive license to Springer Nature Switzerland AG 2024

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 Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Paper in this product is recyclable.

Preface

This book explores a dynamic landscape where cutting-edge technologies are revolutionizing various domains. This captivating book delves into the advancements in security, communication, and environmental management, highlighting their profound impact on society. The developments bridge the gap between human needs and technological innovation. Readers will uncover the fascinating world of IoT-driven devices that seamlessly integrate into our lives, ensuring enhanced safety and communication efficiency. This book is a must-read for technology enthusiasts, researchers, and anyone curious about the transformative power of technology in shaping our present and future.

Lumut, Malaysia
Machang, Malaysia
Masai, Malaysia
Esslingen am Neckar, Germany

Azman Ismail
Fatin Nur Zulkipli
Mohd Amran Mohd Daril
Andreas Öchsner

Contents

Development of a Motion Activated Security Cam for Monitoring Applications	1
Noor Hidayah Mohd Yunus, Muhamad Ihsan Muhamad Zamri, and Norliana Yusof	
Development of a Sign Language Translator Based on Gestures-To-Words Using IoT	9
Siti Nor Zawani Ahmmad, Wan Alia Najiha Wan Mohammad, and Sairul Izwan Safie	
Energy Management System for ICU Wards	19
Muhammad Akram Rosli and Punithavathi Thirunavakkarasu	
Two Factor Authentication: Voice Biometric and Token-Based Authentication	27
Herny Ramadhani Mohd Husny Hamid, Nur Wazir Nordin, Norhaiza Ya Abdullah, Wan Hazimah Wan Ismail, and Dalilah Abdullah	
Development of a Forest Fire Prevention System Using Fuzzy Logic Control	37
Daniel Shafiq Faizal Parish, Mohd Aliff Afira Sani, Azavitra Zainal, Mohd Ismail Yusof, and Sairul Izwan Safie	
Smart Glove: The Sign Language Translator for Mute-Deaf Citizens	47
Syafiq Azman, Nadilah Mohd Ralim, Shahidatul Arfah Baharudin, Diyana Ab Kadir, and Nur Zaimah Ahmad	
The Application of Technology Organization Environment Framework in the Approaches for Smart Warehouse Adoption	57
Amirul Haqim Khalid, Hairul Rizad Md Sapry, Jimisiah Jaafar, and Abd Rahman Ahmad	

Promoting and Preserving Malaysian Folktales Through Augmented Reality Technology	63
Masyarah Zulhaida Masmuzidin, Muhammad Afif Mohd Yusof, and Nur Syahela Hussien	
The Development of a Self-Balancing Robot Based on Complementary Filter and Arduino	71
Mohd Aliff Afira Sani, Joshua Balan Anak David, Noor Huda Jaafar, Mohd Ismail Yusof, Nor Samsiah Sani, and Siti Fairuz Nurr Sadikan	
Development of Vertical Indoor Farming Using an Arduino and IoT ...	79
Muhammad Shafique Ashroff Md Nor, Mohd Aliff Afira Sani, Mohd Ismail Yusof, Ashraf Rohanim Asari, Sallaudin Hassan, and Nor Samsiah Sani	
Designing an Augmented Reality Application as a Tool for Entomophobia Treatment	87
Masyarah Zulhaida Masmuzidin, Nur Syahela Hussien, Suzidiana Sulaiman, Sharifah Nur Humaira Barakbah, and Wan Shazlina Wan Ismail	
The Readiness of Logistics Service Providers to Meet the Rapidly Growing Digital Economy in Malaysia	95
Wan Nor Azyan Dalilah Zamri, Hairul Rizad Md Sapry, Jimisiah Jaafar, and Abd Rahman Ahmad	
Review of the Use of Digital Media Products by Small and Medium Enterprises in Malaysia During the Covid-19 Pandemic Crisis	99
Farahwahida Mohd	
The Influence of Information Communication Technology Towards the Success of Ro-Ro Ferry Service at Penang Port	105
Siti Aisyah Wahab, Amayrol Zakaria, and Aminuddin Md Arof	
Pass Matrix Based Graphical Password Authentication on the Android Platform	113
Norhaiza Ya Abdullah, Irfani Syuhada Anizam, HERNY Ramadhani Mohd Husny Hamid, and Wan Hazimah Wan Ismail	
Development of a Driver Detection System for Somnolence and Alertness Based on Image Processing Techniques	123
Mohd Fauzi Abu Hassan, Ahmad Arifridhwan Yakcob, Anis Sofi Ahamad Saleh, Ahmad Shahrizan Abdul Ghani, and Mohd Helmy Abd Wahab	