

Selected Readings in  
**COMPUTING AND  
TELECOMMUNICATIONS**

Editors  
Mira Kartiwi  
Teddy Surya Gunawan  
Aisha Hassan Abdalla Hashim



IIUM Press  
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

**SELECTED READINGS IN  
COMPUTING AND  
TELECOMMUNICATIONS**

---

**Editors**

Mira Kartiwi

Teddy Surya Gunawan

Aisha Hassan Abdalla Hashim



**IIUM Press**

Published by:  
IIUM Press  
International Islamic University Malaysia

First Edition, 2011  
©IIUM Press, IIUM

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without any prior written permission of the publisher.

Perpustakaan Negara Malaysia

Cataloguing-in-Publication Data

Mira Kartiwi, Teddy Surya Gunawan, Aisha Hassan Abdalla Hashim:  
Selected Readings in Computing and Telecommunications

**ISBN: 978-967-0225-81-4**

Member of Majlis Penerbitan Ilmiah Malaysia – MAPIM  
(Malaysian Scholarly Publishing Council)

Printed by:  
**IIUM PRINTING SDN. BHD.**  
No. 1, Jalan Industri Batu Caves 1/3  
Taman Perindustrian Batu Caves  
Batu Caves Centre Point  
68100 Batu Caves  
Selangor Darul Ehsan

## TABLE OF CONTENT

---

|  |           |
|--|-----------|
| <b>PREFACE .....</b>   | <b>X</b>  |
| <b>1. MANUSCRIPT PROCESSES MONITORING SYSTEM FOR RESEARCH MANAGEMENT CENTER</b>                          |           |
| Aznan Zuhid bin Saidin, Mira Kartiwi and Husam bin Latih @ Abdullatif ..                                 | <b>1</b>  |
| <b>2. IIUM STUDENTS FORUM SYSTEM</b>   |           |
| Mira Kartiwi and Waleed Mohamed Ibrahim .....  | <b>9</b>  |
| <b>3. SABA DECORATION FACTORY (SDF) SYSTEM</b>   |           |
| Mira Kartiwi and Abdulaziz Omar .....  | <b>17</b> |
| <b>4. TAKAFUL AGENCY WEB PORTAL</b>  |           |
| Mira Kartiwi and Mohd. Hafiz Zairin bin Ayop .....   | <b>27</b> |
| <b>5. HUMAN CAPITAL BUSINESS PARTNER INFORMATION TECHNOLOGY &amp; NETWORK TECHNOLOGY MAN POWER MODEL</b> |           |
| Akram M. Z. Khedher and Siti Sarah binti Abdul Halim .....   | <b>39</b> |
| <b>6. DEVELOPMENT OF ENERGY ASSESSMENT TOOLS FOR SINGLE PHASE APPLIANCES</b>                             |           |
| Musse Mohamud Ahmed and Siti Nor Amiza bt Massere.....   | <b>52</b> |
| <b>7. FINGERPRINT AUTHENTICATION SYSTEM USING MATLAB</b>   |           |
| Teddy Surya Gunawan and Mohd. Hanis bin Jenalis .....  | <b>66</b> |
| <b>8. PERFORMANCE EVALUATION OF LOSSLESS SPEECH AND AUDIO COMPRESSION ALGORITHMS</b>                     |           |

|  |            |
|--|------------|
| <b>9. DESIGN AND IMPLEMENTATION OF VOICE SECURITY SYSTEM IN MATLAB AND JAVA</b>                            |            |
| Teddy Surya Gunawan and Siti Ruqayah bt. Mohd Akahsah.....   | <b>91</b>  |
| <b>10. DESIGN AND DEVELOPMENT OF RFID SECURITY MODEL</b>   |            |
| Ahmed Wathik Naji and Fatema-Tuz-Zohra .....   | <b>112</b> |
| <b>11. RADIO PROPAGATION MEASUREMENT AND CHANNEL MODELLING FOR WIRELESS BODY AREA NETWORK</b>              |            |
| Mimi Aminah bt. Wan Nordin and Norsyaidatul Fairuz bt. Fauziz .....  | <b>125</b> |
| <b>12. FEATURE EXTRACTION FOR AUTOMATIC FETUS AGE ESTIMATION FOR ULTRASOUND IMAGES USING ELLIPSE MODEL</b> |            |
| Teddy Surya Gunawan and Norakmal Abdullah .....  | <b>143</b> |
| <b>13. NOISE REDUCTION USING KALMAN FILTER</b>   |            |
| Teddy Surya Gunawan and Ismail Haji Hassan Dualeh.....   | <b>168</b> |
| <b>14. PARALLEL ALGORITHMS FOR EDGE DETECTION ON CLUSTER COMPUTER</b>                                      |            |
| Teddy Surya Gunawan and Elkabir Ansoya Bacar.....  | <b>189</b> |
| <b>15. PREDICTION OF PROBABILITY OF BIT ERROR RATE IN DIGITAL COMMUNICATION SYSTEM</b>                     |            |
| Saad Osman Bashir, Abdallah Mohammed Tawfeeq Zyoud and Besir Salah Eldin Mahmoud Sid Ahmed .....           | <b>209</b> |
| <b>16. COMPARATIVE ANALYSIS OF LOW POWER VLSI CIRCUITS TECHNIQUES</b>                                      |            |
| Anis Nurashikin Nordin and Fatin Alea bt. Talib .....  | <b>219</b> |

|   |            |
|---|------------|
| <b>17. SPHERICAL POV LED DISPLAY USING PIC 16F628</b>   |            |
| Teddy Surya Gunawan and Muhammad bin Ahmad .....  | <b>235</b> |
| <b>18. IMPLEMENTATION OF CAPACITANCE OF VOLTAGE CONVERTER FOR CAPACITIVE TRANSDUCERS</b>                  |            |
| A.H.M. Zahirul Alam and Nur Fadhila bt. Che Halim .....   | <b>255</b> |
| <b>19. PROTEIN CODING IDENTIFICATION OF HUMAN DNA SEQUENCE USING WAVELET</b>                              |            |
| Teddy Surya Gunawan and Norashikin Abdul Wahab .....  | <b>274</b> |
| <b>20. OPTIMIZATION OF ZAKAT MANAGEMENT SYSTEM IN INDONESIA USING GEOGRAPHIC INFORMATION SYSTEM (GIS)</b> |            |
| Muharman Lubis .....  | <b>292</b> |
| <b>21. IIUM CAR STICKER RECOGNITION USING PHASE BASED TEMPLATE MATCHING ALGORITHM</b>                     |            |
| Teddy Surya Gunawan and Siti Aisyah bt. Mohamad .....   | <b>308</b> |

## **10. DESIGN AND DEVELOPMENT OF RFID SECURITY MODEL**

---

Ahmed Wathik Naji and Fatema-Tuz-Zohra

### **ABSTRACT**

RFID stands for Radio Frequency Identification, a technology that has been used for many years in stock tracking and secure access applications. At the most basic level, RFID is a wireless link used to distinctively identify objects. RFID systems use electronic devices called transponders or tags, and readers to communicate. Unidirectional or bidirectional radio signals are used to carry data. Each day millions of securities are breached and electrical energy is wasted, to overcome this, a model needs to be developed that will control the entrance, exit and power supply automatically. In this work a RFID security model has been proposed, developed and implemented. The proposed model is composed of a RFID transponder, reader, and electromagnetic door lock and integrated lighting system. Methodology used is studying the background and theory of the project, propose the design, construct and implement the model. As an outcome, the security model allows only authentic users inside a room turning lights on for them, and lights are turned off when they exit. The principal objectives of the project have been fulfilled, the model is functional but it is always open to more contributions.

### **10.1 INTRODUCTION**

RF technology has been involved in markets in various applications such as access controls, sensors, metering applications, payment system, communications and transportation, parcel and document tracking, distribution logistics, automotive systems, livestock/pet tracking and