

MECHATRONICS

BOOK SERIES

SYSTEM DESIGN AND SIGNAL PROCESSING

VOLUME 2

Editors

Md. Raisuddin Khan

Md. Mozasser Rahman

Muhammad Mahbubur Rashid

Shahrul Na'im Sidek



IIUM PRESS

INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

**MECHATRONICS BOOK SERIES:
SYSTEM DESIGN AND SIGNAL
PROCESSING - VOLUME 2**

Editors

Md. Raisuddin Khan
Md. Mozasser Rahman
Muhammad Mahbubur Rashid
Shahrul Na'im Sidek

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

ISBN: 978-967-418-132-1

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
Tel: +603-6188 1542 / 44 / 45 Fax: +603-6188 1543
EMAIL: iiumprinting@yahoo.com

CONTENTS

Editorial Notes	v
About the Editors	vi
Contents	vii
1. A Brief Overview of Biomechatronics and Its Applications.....	1
<i>Nur Izatulnisha A.Rashid, Jamaliah Kassim and Asan G. A. Muthalif</i>	
2. Self-Powered Solar Tracking System Part 1: System Modeling and Hardware Selections.....	7
<i>Asan G. A. Muthalif, Dzairul Hafiz and Haris Shafiq</i>	
3. Self-Powered Solar Tracking System Part 2: System Design.....	14
<i>Asan G.A. Muthalif, Dzairul Hafiz and Haris Shafiq</i>	
4. Self-Powered Solar Tracking System Part 3: System Integration and Testing.....	19
<i>Asan G.A. Muthalif, Dzairul Hafiz and Haris Shafiq</i>	
5. Smart System For Monitoring Electrical Power Usage at Homes.....	25
<i>Kawthar A. Rahman, Asan G. A. Muthalif and Nurul F. Shua'ib</i>	
6. Vibration Based Predictive Maintenance: Common Rotating Machinery Faults and Their Signatures.....	30
<i>Siti F. Mansor, Asan G. A. Muthalif and Nurul 'I. Zaman</i>	
7. Modeling of Disc Rotor Induction Motor.....	38

M. M. Rashid, S. Abubakar and R.Tamjis

8. Computer Communication for a Smart Card Based Ordering System Via Visual Basic..... 52
Siti Fauziah Toha and Rosdiazli Ibrahim
9. Electronic Smart Ordering System: Graphical User Interface 59
Siti Fauziah Toha and Rosdiazli Ibrahim
10. Intruder Avoidance System Via Short Message Service (SMS)..... 65
Siti Fauziah Toha and Mohammad Zafran Haja Mohideen
11. Anti Skid Control System, A Tutorial..... 71
M. J. E. Salami, R. Khan, A.M. Aibinu, Syahrul Syazanizam Bin Md Said and Mohd Sofian Bin Basrah
12. Intelligent Anti Skid Control System..... 75
M. J. E. Salami, R. Khan, A.M. Aibinu, Syahrul Syazanizam Bin Md Said and Mohd Sofian Bin Basrah
13. Principles of FMCW Radar Signal Processing..... 91
Wahju Sediono and Andrian Andaya Lestari
14. Design and Implementation of a Simple Queueing System for Vehicle Traffic Simulator..... 99
Wahju Sediono
15. Determination of Target Speed from the FMCW Radar Data..... 107
Wahju Sediono and Andrian Andaya Lestari
16. Intelligent Egg Incubator: Introduction..... 116
Shahrul Na'im Sidek, Yasir Mohd Mustafah, Urwah Ismail, Nur Hasnaa Che Awang
17. Intelligent Egg Incubator: Mechanical Design..... 125

Shahrul Na'im Sidek, Yasir Mohd Mustafah, Urwah Ismail, Nur Hasnaa Che Awang

18. Intelligent Egg Incubator: System Integration And Results 137
Shahrul Na'im Sidek, Yasir Mohd Mustafah, Urwah Ismail, Nur Hasnaa Che Awang

19. Human Posture Recognition Classification And Recognition..... 157
Kyaw Kyaw Htike, Othman O. Khalifa and and Lai Weng Kin

20. Human Posture Recognition Preprocessing Techniques..... 162
Othman O. Khalifa, Kyaw Kyaw Htike, Lai Weng Kin and A. Albagoul

21. Path Detection Implementation Using Fuzzy Classifier 171
Imran Moez Khan, Yusof Zaw Zaw, Othman O. Khalifa and Lai Weng Kin

22. Mechanical Design Of Unmanned Underwater Vehicle 180
Md. Raisuddin Khan, M. Zuhdi and Masum Billah

23. Design And Development Of An Automated Café System..... 187
Md. Raisuddin Khan, MAS Kamal and Masum Billah

24. Speech Coding Using Compressive Sensing On A Multicore System 194
T.S. Gunawan, Othman O. Khalifa, A. A. Shafie and E. Ambikairajah

25. A Case For Cooperative Vision System..... 202
A. A. Shafie and N. Samudin

26. Path Following Autonomous Vehicle Based On Vision System..... 208
A. A. Shafie, E. A. Syukur and N. I. Sidek

27. Trajectory Planning Using Gps For Unmanned Aerial Vehicle With Microcontroller Based System 215
A. A. Shafie, Md. Raisuddin Khan and M Shehzad Islam

28. Digital Hearing Aids Analysis And Implementation.....	224
<i>Othman O. Khalifa, Aisha H. Abdalla and Sheroz Khan</i>	
29. Automatic Intelligent Ordering System: Design And Tools Selection	233
<i>Siti Fauziah Toha and Rosdiazli Ibrahim</i>	
30. Automatic Smart Card Purchasing System for Express Kiosk.....	240
<i>Siti Fauziah Toha and Rosdiazli Ibrahim</i>	
31. Finite Element Formulation of Piezoelectric Laminated Composite Plate	247
<i>Iskandar Al-Thani Mahmood and Md. Raisuddin Khan</i>	
32. A Review on Modeling And Shape Control Of Piezoelectric Laminated Composite Plate Using Finite Element Method.....	257
<i>Iskandar Al-Thani Mahmood and Md. Raisuddin Khan</i>	
33. Development of Auto Parking System & Auto Billing System Using Image Processing Technique (Part 1).....	267
<i>M. M. Rashid</i>	
34. Development of Auto Parking System and Auto Billing System Using Image Processing Technique (Part 2)	274
<i>M. M. Rashid</i>	
35. Development of Auto Parking System& Auto Billing System Using Image Processing Technique (Part 3).....	281
<i>M. M. Rashid</i>	
36. Automatic Car Parking Management System for Large Parking Lot.....	289
<i>M. M. Rashid</i>	
37. Development of Wireless Home Power Monitoring System	296
<i>M. M. Rashid</i>	

CHAPTER 29

AUTOMATIC INTELLIGENT ORDERING SYSTEM: DESIGN AND TOOLS SELECTION

Siti Fauziah Toha^{1,a} and Rosdiazli Ibrahim^{2,b}

¹Department of Mechatronics, Faculty of Engineering, International Islamic University Malaysia, Malaysia

²Department of Electrical and Electronics Engineering, Faculty of Engineering, Universiti Teknologi PETRONAS, Malaysia

^atsfauziah@iium.edu.my, ^brosdiazli@petronas.com.my

29.1 Introduction

This chapter presents the essence of the design of software of Automatic Intelligent Card-Based Ordering System: a current scenario in Malaysia's fast-food service counter. It concerns three major phases which are Database Collection Centre, Menu Selection Base as well as the Prepaid Card Detector. A database system which contains of all related information on the menu and payment is build and available for user to access via the visual user interface. The Graphical User Interface (GUI) for both server and client application is developed using Visual Basic 6.0. An enormous demand for storage capacity and the amount of information that can be stored in a small space increased so therefore, a prepaid card system is introduced as the final stage. The endeavor of the study is to construct a networking application to a real basis life and also, the established system can minimize or eliminate the use of manhandling food counter at the fast food outlets. Moreover, as the research study is concerned Smart Card system [1] has met the requirement as an expended application field of electronic money. The objectives of this chapter are: 1) To establish a system where the fast food counter can be eliminated or its usage minimized. 2) To design a menu selection system that is located on the eating table so that customers can be assured of a seating location upon ordering. 3) To ascertain a data management where statistical data is available for the system and can be viewed easily. 4) To implement the use of prepaid card system using smart card application where customers do not need cash to pay for their food.

29.2 Proposed System

As stated in the objectives above, the project is done in response to a foreseeable problem encountered in our daily life. The fast food outlet is but one of the locations where a similar system can be implemented. It is hence one of the applications where cashless convenience could be enjoyed. By doing this project, the author is hoping to be able to come up with a stable and complete system which can be used at the outlets.

The project can be subdivided into several sections (Figure 29.1). The three main sections of the system are: