

ELECTRICAL & ELECTRONIC ENGINEERING: Theory and Applications

**SERIES 5: Microelectronic, Medical
Electronic and Image Retrieval**

ELECTRICAL & ELECTRONIC ENGINEERING: Theory and Applications

**SERIES 5: Microelectronic, Medical
Electronic and Image Retrieval**

EDITORS:

SITI ZARINA MOHD MUJI

RAHMAT SANUDIN



2017

© Penerbit UTHM
First Published 2017

Copyright reserved. Reproduction of any articles, illustrations and content of this book in any form be it electronic, mechanical photocopy, recording or any other form without any prior written permission from The Publisher's Office of Universiti Tun Hussein Onn Malaysia, Parit Raja, Batu Pahat, Johor is prohibited. Any negotiations are subjected to calculations of royalty and honorarium.

Perpustakaan Negara Malaysia Cataloguing—in—Publication Data

ELECTRICAL & ELECTRONIC ENGINEERING : Theory and Applications.
SERIES 5 : Microelectronic, Medical Electronic and Image Retrieval / EDITORS:
SITI ZARINA MOHD MUJI, RAHMAT SANUDIN

Includes index

ISBN 978-967-2110-40-8

1. Programmable controllers. 2. Microcontrollers--Programming.
 3. Ultrasonics. 4. Government publications--Malaysia.
 - I. Siti Zarina Mohd Muji, 1978-. II. Rahmat Sanudin.
- 629.895

Published by:
Penerbit UTHM
Universiti Tun Hussein Onn Malaysia
86400 Parit Raja,
Batu Pahat, Johor
Tel: 07-453 7051 / 7454
Fax: 07-453 6145

Website: <http://penerbit.uthm.edu.my>
E-mail: pt@uthm.edu.my
<http://e-bookstore.uthm.edu.my>

Penerbit UTHM is a member of
Majlis Penerbitan Ilmiah Malaysia
(MAPIM)

Printed by:
PERCETAKAN IMPIAN SDN. BHD.
No. 10, Jalan Bukit 8,
Kawasan Perindustrian Miel,
Bandar Baru Seri Alam,
81750 Masai, Johor

Contents

<i>Preface</i>		<i>ix</i>
Chapter 1	Hyperspectral Imaging System and its Clinical Application	1
1.1	Introduction	1
1.2	The Operation of Point Spectroscopy, Multispectral and Hyperspectral Imaging	2
1.3	Hyperspectral Imaging System	4
	1.3.1 Experimental Instruments and Optical System	5
	1.3.2 Data Acquisition and Image Formation	6
	1.3.3 System and Wavelength Calibration	6
1.4	Spectroscopic Data Acquisition and Hyperspectral Image Processing	7
1.5	Clinical Application of Hyperspectral Imaging System	8
1.6	Conclusion	9
	References	10
Chapter 2	Application of Carbon Nanotube in Field Effect Transistor	13
2.1	Introduction	13
2.2	Mosfet Scaling And Its Limitation	14
	2.2.1 Scaling Process of MOSFET	14
	2.2.2 Limitation in MOSFET Scaling	15
2.3	Carbon Nanotube Structures, And Properties	16
	2.3.1 CNT Structure	16
	2.3.2 Properties of Carbon Nanotube	18

	2.3.3 Electron transport in SWNT	18
2.4	Carbon Nanotube Field-Effect Transistor	19
	2.4.1 Structure of CNFET	19
	2.4.2 Operation of CNFET	21
2.5	CNFET Simulation	22
	2.5.1 Methodology	22
	2.5.2 Result	25
2.6	Conclusion	27
	References	28
Chapter 3	Development of Fan Beam and Parallel Beam Hybrid Projections in Optical Tomography	31
3.1	Introduction	31
3.2	Mixed-Projection Optical Tomography	33
	3.2.1 LBP	33
	3.2.2 FLBP	35
3.3	Measurement Parameter	36
	3.3.1 Concentration Profile	36
	3.3.2 PSNR and NMSE	38
3.4	The Process	39
3.5	The Measurement Section	41
3.6	Results and Discussion	43
3.7	Conclusion	47
	References	47
Chapter 4	E-Book Content-Based Image Retrieval	51
4.1	Introduction	51
4.2	Overview of Content-Based Indexing and Retrieval	53
4.3	Approaches for Document Identification	55
4.4	Related Works	57
4.5	Digital Image Acquisition	57