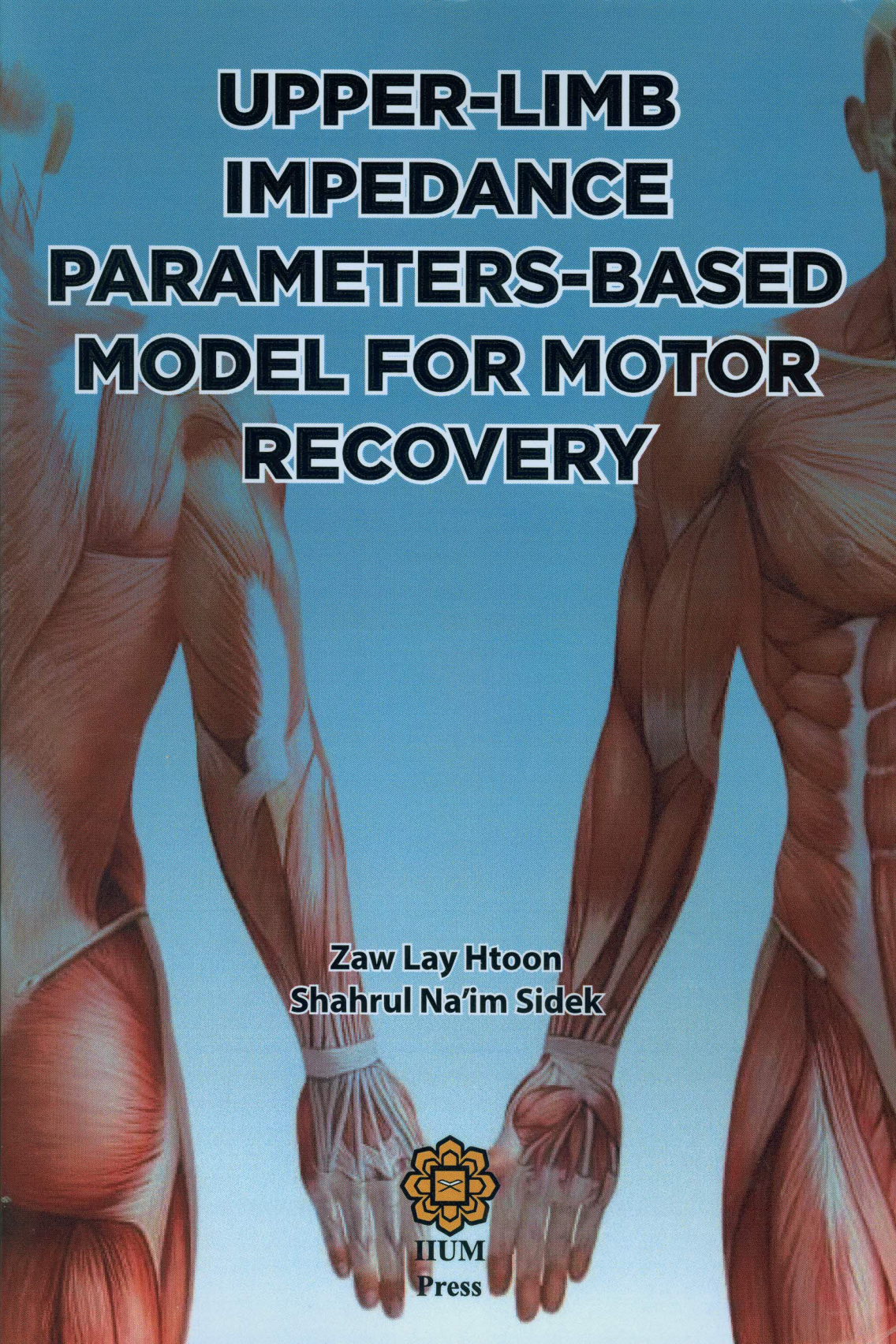
UPPER-LIMB IMPEDANCE PARAMETERS-BASED MODEL FOR MOTOR RECOVERY



Zaw Lay Htoon
Shahrul Na'im Sidek

IIUM
Press

UPPER-LIMB IMPEDANCE PARAMETERS-BASED MODEL FOR MOTOR RECOVERY

Zaw Lay Htoon
Shahrul Na'im Sidek

IIUM
Press
Gombak • 2017

First Print, 2017

IIUM Press is a member of Majlis Penerbitan Ilmiah Malaysia – MAPIM
(Malaysian Scholarly Publishing Council)

Perpustakaan Negara Malaysia Cataloguing-in-Publication Data

Zaw, Lay Htoon; Sidek, Shahrul Na'im
UPPER-LIMB IMPEDANCE PARAMETERS-BASED MODEL FOR MOTOR RECOVERY / ZAW LAY HTOON.
ISBN 978-967-418-476-6
1. Motor ability. 2. Mechanical impedance.
3. Human mechanics. 4 Movement-Physiology.
5. Cardiovascular disease--Patients.
I. Title.
612.04

Published & Printed in Malaysia by
IIUM Press
International Islamic University Malaysia
P.O. Box 10, 50728 Kuala Lumpur, Malaysia

CONTENTS

UPPER-LIMB IMPEDANCE PARAMETERS-BASED MODEL FOR MOTOR RECOVERY

Estimation of patients' muscle tones allow proper prescription of therapy and determination of physical recovery progress. The book proposes a strategy for the estimation of upper-limb mechanical impedance parameters as a mean for the prediction and assessment of subjects' muscle tone level and recovery state. The human upper-limb is modeled as a mass-spring-damper system and represented as an Auto Regressive eXogenous (ARX) dynamic equation for the estimation of upper-limb mechanical impedance parameters. The estimated impedance parameters are then fed as inputs to a trained Artificial Neural Network (ANN) which is used to predict, the subjects' muscle tone level and recovery state during rehabilitation exercise.

Z.L Htoon received the B. Eng. degree from Yangon Technological University, Myanmar in 2012 and M.Sc. degree in Mechatronics Engineering from the International Islamic University Malaysia, Kuala Lumpur Malaysia, in 2017. He is currently working in Accenture as system analyst. His research interests include analysis of bio-signals, prostheses design and robot-assisted rehabilitation.

S. N. Sidek received the B. Eng. and Ph.D. degrees from Vanderbilt University, USA, in 1998 and 2008, respectively. Currently, he serves as Associate Professor of Mechatronics Engineering at Department of Mechatronics Engineering, International Islamic University Malaysia. He is currently a senior member of IEEE. His research interests include human centered elctromechanical system, human robot interation and affective state computing.

ISBN 978-967-418-476-6

9 789674 184766

IIUM Press
Tel : +603 6196 5014 / 6196 5004
Fax : +603 6196 4862 / 6196 6298
Email : iiumbookshop@iium.edu.my
Website : http://iiumpress.iium.edu.my/bookshop