
BASIC OF
CONTROLLER
DESIGN
THEORY AND APPLICATIONS
ZAMBERI JAMALUDIN
LOKMAN ABDULLAH
NUR AIDAWATY RAFAN

ISBN: 978-629-7741-89-5

FIRST PUBLISHED 2025

Member of the Malaysian Scholarly Publishing Council (MAPIM)
Member of the Malaysian Book Publishers Association (MABOPA)
Member of Clarivate Analytics

Editor and Proof Reader
Syed Najib Syed Salim

Manuscript Editor
Rahizah Abdul Rahman

Book Cover Designer and Typesetter
Ahmad Masmuliyadi Mohd Yusof

Published and Printed in Malaysia by
Penerbit UTeM Press
Universiti Teknikal Malaysia Melaka
Hang Tuah Jaya, 76100 Durian Tunggal, Melaka, Malaysia.
Phone: +606 270 1241 Fax: +606 270 1038

Cataloguing-in-Publication Data

Perpustakaan Negara Malaysia

A catalogue record for this book is available from the National Library of Malaysia

ISBN 978-629-7741-89-5

TABLE OF CONTENTS

BASIC OF CONTROLLER DESIGN
THEORY AND APPLICATIONS

Rapid advancement in technology has enabling applications of new complex processes and machineries with greater efficiency and productivity. At the heart of these various technological break-through is the ability of the systems to function in the best possible manner with the least errors deemed possible. For these mechatronic systems, well designed motion controller is essential. Control system theory and design are fundamental knowledge in engineering education and highly important to those practicing in the field of robotics and automation.

Mastering the control theory and the tools necessary to realise a good controller design is essential for any mechatronics system designer and engineer. However, this can be of great challenge to many aspiring mechatronics engineers. With so many advanced control theory books and references in the market, the choice can be a challenge in itself. An easy-to-follow step-by-step approach to a complete controller design with minimal understanding on the often-complicated control theory would be an attractive option to many in the field.

ZAMBERI JAMALUDIN, received his Bachelor Degree in Chemical Engineering from Lakehead University, Canada in 1997 before completing his Master of Engineering (Manufacturing System) from National University of Malaysia in 2001. In 2008, the author completed his PhD study in the field of Control Engineering from Katholieke Universiteit Leuven, Belgium. The author is currently a Professor at the Faculty of Industrial and Manufacturing Technology and Engineering, Universiti Teknikal Malaysia Melaka (UTeM)-Malaysia since 2002. The author areas of specializations are control system, robotics, automation and machining.

LOKMAN ABDULLAH, received the BEng degree in Manufacturing Engineering from International Islamic University of Malaysia (IIUM), in 2005, the MSc degree in Manufacturing Systems Engineering from Coventry University, UK, in 2008, and the PhD degree in Control Systems Engineering from Universiti Teknikal Malaysia Melaka (UTeM), Malaysia, in 2014. He is currently an Associate Professor at Faculty of Industrial and Manufacturing Technology and Engineering, Universiti Teknikal Malaysia Melaka, Malaysia. His fields of interest are in control systems, Multiple Criteria Decision Making (MCDM), Mechatronics and Industrial Automation.

NUR AIDAWATY RAFAN, received PhD in Control Engineering from Universiti Teknikal Malaysia Melaka in 2017, MEng in Manufacturing Engineering from Universiti Malaya in 2008 and BEng in Mechanical Engineering from Universiti Teknologi PETRONAS in 2003. She is currently a senior lecturer in Faculty of Industrial and Manufacturing Technology and Engineering, Universiti Teknikal Malaysia Melaka. With her wide knowledge in Mechanical Engineering and Control Systems Engineering, her research is in control systems in drive system, sensor and instrumentation, machine vision inspection system and industrial automation. Dr. Nur Aidawaty has been in academics for more than 10 years and published bookchapters and technical papers in local and international journal publications.

UTeM
UNIVERSITI TEKNIKAL MALAYSIA MELAKA
PENERBIT UTeM *Press*

Website : **https://penerbit.utem.edu.my**
Books Online : **https://utembooks.utem.edu.my**
Email : **penerbit@utem.edu.my**

ISBN 978-629-7741-89-5
05000