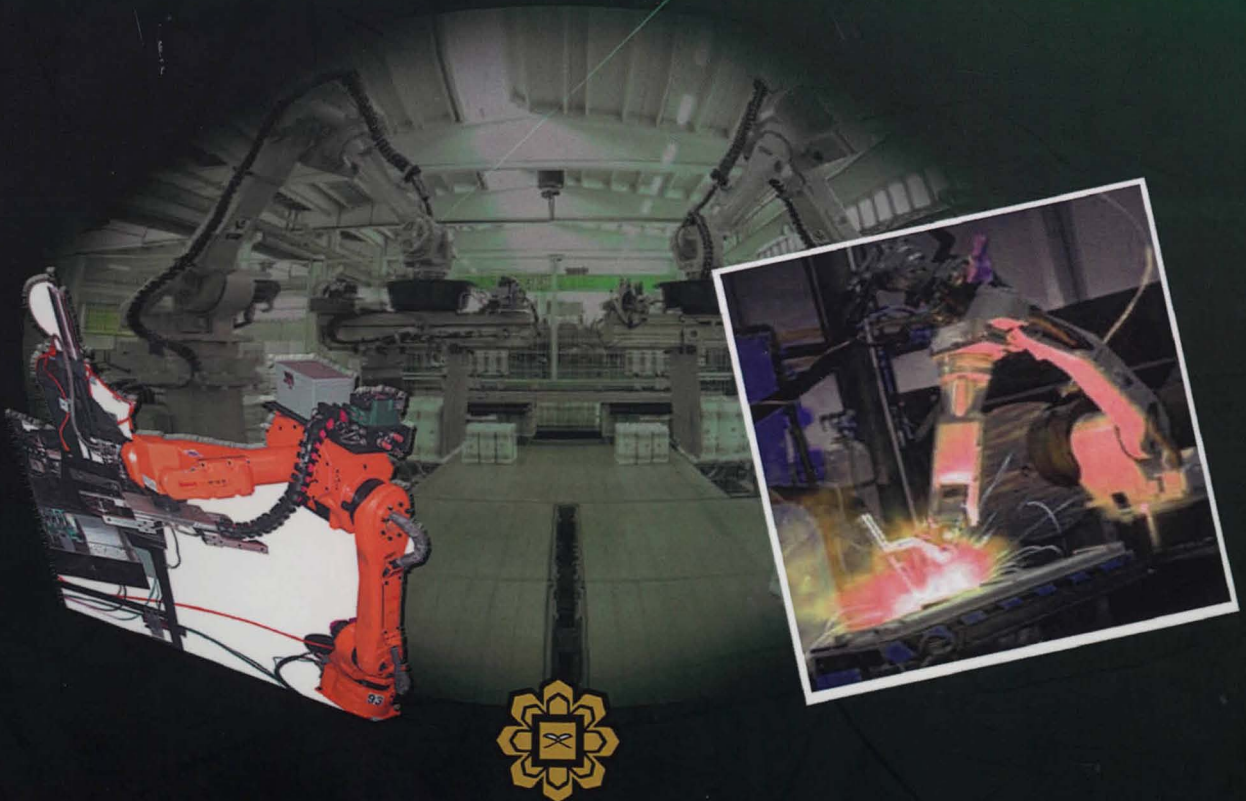


MECHATRONICS BOOK SERIES

ROBOTICS AND AUTOMATION

Rini Akmeliawati
Wahju Sediono
Nahrul Khair Alang Md. Rashid



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Editors

Rini Akmeliawati
Wahju Sediono
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EMAIL: iiumprinting@yahoo.com

TABLE OF CONTENTS

Preface	i
Acknowledgement	ii
Editor	iii
Table of Content	v
1. Visual Tracking for Human Face A.A. Shafie, Iqbal and M.R. Khan	1
2. Robot Design : A Case Study of Team Learning Experience and Outcome A.A. Shafie	7
3. Development Neck Support for Humanoid Robot Head A. A. Shafie, M.N. Kasyfi and N. I. Taufik Y	14
4. Development of Cooperative Mini Robot Amir A. Shafie , Siti E.M.Z and Shazeela A	21
5. Humanoid Robot Arm Amir A. Shafie and Mohd N. Y.	26
6. Designing Human Robot Interaction for Emotionally Expressive Robotic Hear AMIR-III A. Iqbal, A. A. Shafie, and M. R. Khan	32
7. An Overview of Fuzzy Based Person Following Robot T. Alamgir, I. J. Alfar and M. M. Rashid	38
8. Mechanical Design of a Person Following Robot Tarik Bin Alamgir, Ibrahim Jawad Alfar and Muhammad Mahbubur Rashid	43

9. Development of Fuzzy Based Person Following Robot part 2	49
Tarik Bin Alamgir, Ibrahim Jawad Alfar and Muhammad Mahbubur Rashid	
10. Mobile Robot for Fined Tube Inspection	56
Muhammad Mahbubur Rashid	
11. Robot Aided Upper Limb Rehabilitation System: Mechanical Design	
Shahrul Na'im Sidek, Hidayatullah Mohamed Nawi	64
12. Robot Aided Upper Limb Rehabilitation System: Electronics for Sensors and Actuators	69
Shahrul Na'im Sidek, Khairul Anwar Khalid	
13. Robot Aided Upper Limb Rehabilitation System: Results and Analysis	73
Shahrul Na'im Sidek	
14. Snake Robot Locomotion in Narrow Space: A Review	79
Raisuddin Khan, Mitsuru Watanabe and Masum Billah	
15. Multiple Hexapod Robot and Collaborative communication	86
Raisuddin Khan, Masum Billah and Mohiuddin Ahmed	
16. Autonomous Unicycle Robot Using Reaction Wheel Pendulum: Mechanical Design	94
Atika Adrina Teepol, Nur Fadhilah Mohd Fauzey, Shahrul Na'im Sidek, Yasir Mohd Mustafah	
17. Autonomous Unicycle Robot Using Reaction Wheel Pendulum: Controller Design	103
Nur Fadhilah Mohd Fauzey, Atika Adrina Teepol, Shahrul Na'im Sidek, Yasir Mohd Mustafah	

HISTORICAL BACKGROUND AND EDUCATION

19. **Develop an Algorithm for Goal Finding Robot using Reinforcement Learning** 118
M. Kamal, R. Khan, S. Bazuhair and M. Billah

20. **Design and Development of 2 Fingers Robotic Hand Actuated by Active Grasping Data** 126
MdMozasser Rahman¹, MohdZoolfadli B MdSalleh

21. **Design and Development of Interactive Fish Robot** 144
MdMozasser Rahman¹, RizaMuhida and Mohammad Zukhair b MohdNazmi

22. **Design and Development of A Digger Robot** 154
MdMozasser Rahman, MohdRuzaini Bin AbdRahim and Others

23. **Glass Wall Cleaning Robot: A Review** 170
Md Mozasser Rahman, Ahmed Murgab Mohammed Mahil, Norsofiana Bt Umar and Nurul Izzati Bt Samsuddin

24. **Glass Wall Cleaning Robot: -Electrical design and control** 177
Md Mozasser Rahman, Ahmed Murgab Mohammed Mahil, Norsofiana Bt Umar and Nurul Izzati Bt Samsuddin

25. **Glass Wall Cleaning Robot: -Electrical design and control** 187
M. M. Rahman, M. R. b A. Ralim

- ✓ 26. **Development of Robotic Manipulator to assist human using brain Signal** 198
Mahbuba Hossain, Raisuddin Khan, and Masum Billah

- ↳ 27. **Glass Wall Cleaning Robot: Mechanical Design** 204
Mahbuba Hossain Raisuddin Khan, and Masum Billah

28. Intelligent SCADA Based Monitoring Scheme for Low Voltage Distribution System	210
M. J. E. Salami, A. M. Aibinua, Mohd Shafie Bin Sani and Nurfaizal Bin Wahi	
29. Intelligent SCADA Based Monitoring Scheme for Low Voltage Distribution System	218
Abdullateef Ayodele Isqeel and Momoh Jimoh Eyiomika Salami.	
30. Autonomous Goal Finding Robot	227
M. Kamal, Md. R. Khan, Faisal and M. Billah	
31. Intelligent SCADA Based Pipe Monitoring System	236
M. J. E. Salami, A. M. Aibinua, Mohd Shafie Bin Sani and Nurfaizal Bin Wahi	
32. Path Tracking of Car Like Mobile Robot	250
A. A. Isqeela and M. J. E. Salami	
33. A New Energy Efficient Building System	255
M. J. E. Salami, Md. R. Khan, O. A. Abdulquadric	
34. Automatic Car Parking System	262
M. J. E. Salami, Md. R. Khan and O. A. Abdulquadria	
35. Anthropomorphic biped robot	267
A. A. Shafie, M. F. Baharudin	

Design and Development of Digger Robot

Md Mozasser Rahman, Mohd Ruzaini Bin Abd Ralim

Department of Mechatronics Engineering, IIUM, Malaysia

¹mozasser@iium.edu.my

22.1 Introduction

Increasing the construction site to be dug cause problem since there are less number of persons who have the expertise to handle the excavator machine. Moreover, this project also can solve many other problems such as to dig the graveyard and ease the farmer to hole the soil to plant their crops. According to ability of this robot, it can dig various type of soil with different force. Furthermore, it very easy to operate since it just needs parameter from the users to insert and it will run automatically.

This prototype of “Automatic Mobile Digger” has been guided by using C Programming (CCS C). The main part of the robot consists of mobile platform and robotic arm. The purpose of mobile platform is to carry the arm to desired location for digging operation. The robot arm has 4 degree of freedom where all the joints are revolute. The joints are located at base, shoulder, elbow and wrist.

This digger uses several number of DC motors and servo motors which act as the joint to move the wheel and the link and also the potentiometer as a sensor. The circuits consist of interface circuit, motor driver circuit and also 12 Volt power supply unit. The basic coding about the C language, circuits, servo motor, dc motor and also potentiometer will implement in this project. PIC 16877A work as a main controller will guide all movement of the Robot Arm and will performs as a brain of the system.

Our aim is to ensure that the robot not only can move and dig the soil but to also dig the soil according to the desired parameters required by the user. Thus, this robot will help us or lease us especially for disable human being from the terrible task; “digging soil”.

Several objectives are aimed by designing and developing this automatic mobile digger which could be used in various applications, as example:

- Holes for plant.
- Digging graveyard
- Soil re-arrangement
- Digging basement for the building
- Digging quarry and etc.

The product design specifications for this design are as below:

- Able to dig various type of soil
- Dig according to the user desired parameters such as height, length and width

There are three main parts need to be investigated in order this project will be successful, namely autonomous vehicle, robotic arm which is the main part of the our project. The theory of mechanism for robot also must be learnt to achieve the goal of this project.

Locomotion: The mobile or robot locomotion is the process of causing a robot to move. In order to produce motion, forces must be applied to the robot. For this robot it must follow some mobility characteristics to move on land which are: