UNIVERSITI TEKNIKAL MALAYSIA MELAKA

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TAJUK: **Development Of All Terrain Wheeled Robot Prototype For Military Purpose**

SESI PENGAJIAN: 2010/11 Semester 2

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UNIVERSITI TEKNIKAL MALAYSIA MELAKA

DEVELOPMENT OF ALL TERRAIN WHEELED ROBOT PROTOTYPE FOR MILITARY PURPOSE

This report submitted in accordance with requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor Degree of Manufacturing Engineering (Robotic and Automation) with Honors.

by

MOHD ISKANDARED'ZUAN BIN MOHD PAROK

FACULTY OF MANUFACTURING ENGINEERING

2011

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DECLARATION

I hereby, declared this report entitled "Development of All Terrain Wheeled Robot Prototype for Military Purpose" is the results of my own research except as cited in references.

Signature	:	…….
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Date	:	19 MAY 2011

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APPROVAL

This report is submitted to the Faculty of Manufacturing Engineering of UTeM as a partial fulfillment of the degree of Bachelor of Manufacturing Engineering (Automation and Robotics) with Honours. The member of the supervisory committee is as follow:

……

Supervisor

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ABSTRAK

Sebuah robot beroda mudah alih adalah mesin yang mampu bergerak dalam suatu persekitaran tertentu. Projek ini menyampaikan berkenaan perkembangan prototaip robot beroda mudah alih untuk keperluan ketenteraan. Tujuan utama projek ini adalah untuk menghasilkan robot kawalan mudah alih beroda yang mampu bergerak di atas permukaan rata, pasir, dan rumput. Projek ini memfokuskan kepada penghasilan rekabentuk prototaip untuk roda robot mudah alih. Pembangunan bermula dengan pemilihan roda untuk digunakan pada robot. Dalam projek ini, tiga rekabentuk konseptual dicadangkan dan rekaan yang terbaik dipilih untuk dihasilkan. Perisian Solidworks 2009 telah digunakan untuk mereka rekabentuk dan dokumentasi robot mudah alih. Mikrokontroler PIC16F877A tertanam dengan program secara manual untuk mengendalikan sistem robot. Pembuatan program robot mudah alih telah dibuat dengan menggunakan perisian MicroC PRO untuk PIC. Program ini akan menghubungkan ke mikrokontroler dengan menggunakan pengaturcara IUC00A. Untuk menganalisis fungsi dan kecekapan, robot mudah alih telah diuji untuk bergerak di atas permukaan yang tidak sekata seperti lantai, rumput, pasir dan di jalan raya. Keputusan dari ujian yg dilakukan menunjukan bahawa robot mudah alih boleh bergerak di atas permukaan yang diuji. Prototaip dari robot mudah alih beroda sesuai untuk aplikasi tentera.

Kata Kunci: *Robot Mudah Alih Beroda, Robot Ketenteraan, Medan*

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ABSTRACT

A mobile robot is a machine that is capable of movement in a given environment. This project presents the development of an all terrain wheel mobile robot prototype for military purpose. The main aim of this project is to develop manual wheeled mobile robot that is able to move on the flat surface, sand, and grass. This project focuses on develop the prototype design for wheel mobile robot. The development starts with wheel selection to be used on the robot. In this project, three conceptual designs were suggested and the best design was selected to be fabricated. Solidworks 2009 software had been used for detail design and documentation of the mobile robot. Microcontroller PIC16F877A is embedded with the manual programmed to operate the system of the robot. The programming of the mobile robot are been made by using the MikroC PRO for PIC software. The program will interface to the microcontroller with the IUC00A programmer. To analyze its functionality and efficiency, the mobile robot had been tested to move at terrain surfaces which are flat surface, grass, sand and on the tar road. Results confirmed that the mobile robot can move on all tested terrains. The prototype of the wheeled mobile robot is suitable for military platform.

Keywords: *Wheel Mobile Robot, Military Robot., Terrain*

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DEDICATION

This report is dedicated

to my father *(Mohd Parok Bin Abdullah)*,

my lovely mother *(Latipah Bin Zainal Abidin)*,

and

my supervisor for this project *(Madam Syamimi Binti Shamsuddin)*

for every possible kind of help and support.

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LIST OF ABBREVIATIONS

AC	-	Alternating Current
AGV	-	Automated Guided Vehicle
BLDC	-	Brushless Direct Current
CAD	-	Computer Aided Design
DC	-	Direct Current
GPS	-	Global Positioning System
IC	-	Integrated Circuit
IDE	-	Integrated Development Environment
Krpm	-	Kilometer Rotation Per Minutes
LCD	-	Liquid Crystal Display
LED	-	Light-Emitting Diode
MER	-	Mars Exploration Rovers
NASA	-	National Aeronautics and Space Administration
PC	-	Personal Computer
PCB	-	Printed Circuit Board
PIC	-	Programmable Integrated Circuit
PSM	-	Projek Sarjana Muda
PWM	-	Pulse Width Modulation

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