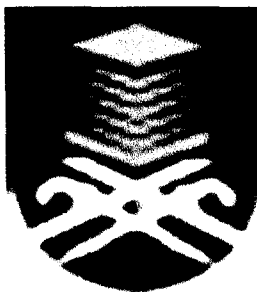


# **INTELLIGENT ROBOT ARM USING AVR MICROCONTROLLER**

**This thesis is presented as a partial fulfillment for the award of the  
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## **ABSTRACT**

This project is a development of robot arm using ATmega8535 microcontroller. The robot arm capable to grasp, hold, lift and put any object from one place to another place. This low cost prototype of robot arm is designed to pick up an unused paper on the floor. The robot arm systems utilize a keypad and implementation of C language programming to control its movement. It is an open loop system with two degrees of freedom (DOF) and two reliable axes which are able to move up, down, right and left. It also consists of four design parts including the base, elbow, wrist and the gripper. The robotic arm that is programmed from AVR Microcontroller chip is connected to three servo motors. The servo motor acts as an actuator which will move according to the angular position required.

# TABLE OF CONTENTS

<b>DECLARATION.....</b>	<b>i</b>
<b>ACKNOWLEDGEMENT.....</b>	<b>ii</b>
<b>ABSTRACT.....</b>	<b>iii</b>
<b>TABLE OF CONTENTS.....</b>	<b>iv</b>
<b>LIST OF FIGURES.....</b>	<b>vii</b>
<b>LIST OF TABLES.....</b>	<b>ix</b>
<b>LIST OF ABBREVIATIONS.....</b>	<b>x</b>

## CHAPTER 1

<b>INTRODUCTION.....</b>	<b>1</b>
1.1 Background of the project.....	1
1.2 Objectives.....	2
1.3 Scope of project.....	2
1.4 Organization of thesis.....	3

## CHAPTER 2

<b>SYSTEM DESIGN AND METHODOLOGY.....</b>	<b>5</b>
2.1 Project implementation.....	5
2.2 Design procedure.....	5
2.3 Methodology.....	6
2.4 Design operation of the robot arm.....	7

## CHAPTER 3

<b>LITERATURE REVIEW.....</b>	<b>9</b>
3.1 Introduction.....	9
3.2 Robot Arm.....	9

# CHAPTER 1

## INTRODUCTION

### 1.1 BACKGROUND OF THE PROJECT

Recently, robot arm is widely used in industrial world, at home or for education purpose due to its efficiency. Some of the applications are pick and place, soldering, welding, cutting, drilling, loading, handling, holding, inspection and painting. A typical robot system can be subdivided into seven principal parts: the manipulator, end effector, actuators, sensors, controller, processor and software [1].

Basically in designing the robot arm, Degree of freedom (DOF) is the important criteria to show the number of coordinates needed in which a robot can move [1, 2]. There are several basic of robot coordinate systems such as articulated robot, cylindrical robot, spherical (polar) robot and Cartesian robot [1]. The muscle of the robot is actuators which convert supplied power into mechanical motion. Based on the industrial applications the types of actuators been used in robot are electric, hydraulic and pneumatic [3]. The types of end effector or grippers designed for industrial based applications such as double gripper, multiple grippers, a gripper with two parallel fingers, dual vacuum grippers and others.

The purpose of this project is based on the literature review and observation made to create application in untidy room where papers everywhere on the floor. It is cheaper than industrial robot which only aims for 2DOF, move in two axes X, Y and maximum load capacity below than 1kg which varies between 100g and 700g. The paper is picked up by the gripper and the shape is like a hook. The movement of each angle for robotic arm can be control by keypad and programming. The used of keypad is based on the interruption concept. It is when the system of the robot arm is being interrupted which by pressing the keypad number, the servo motor will move according to position required.