

الآية

قال تعالى:

(وَقُلْ رَبِّ زِدْنِي عِلْمًا)

[سورة طه: 114]

(وَقُلِ اعْمَلُوا فَسَيَرَى اللَّهُ عَمَلَكُمْ وَرَسُولُهُ وَالْمُؤْمِنُونَ)

[سورة التوبة: 105]

صدق الله العظيم

DEDICATION

This project is dedicated to the souls of all parents. May Allah have mercy upon them and forgive their sins. And to all the hard working parents. May Allah bless them with peace and prosperity. And to all people who prayed for us.

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To Ust. Gaffer Babiker Osman our supervisor who helped and guided us with his professional supervisory that led us to complete the project, To Madam Taiseer Ismail, Eng. Ahmed Mohamed Osman, Abd Elrahman Al-Hafian, And to anyone who gave us a helping hand.

ABSTRACT

Using robots have become more and more common in modern era. Robotics technology is involved in almost every field such as medical, military, engineering and industrial fields. They fulfill the tasks they are designed for with accuracy and efficiency. However, some of these uses require to accomplish tasks that demand moving through rough terrains which is hard to do with conventional moving mechanism. A solution is provided for this problem in this project. The hexapod is a robot that uses six legs to maneuver over almost all terrains, allowing uses that require moving over these terrains to be accomplished. A practical approach is made to make this robot and it was based on robotics researches. By studying robots locomotion and observing the legged robots mechanism the hexapod is built to overcome all types of terrain and adapt to all these types by using multiple walking gaits and make it ready for different tasks.

المستخلص

استخدام الروبوتات أصبح أكثر شيوعاً في العصر الحديث و إن تكنولوجيا الروبوتيات أصبحت مساهمة في شتى المجالات كمجال الطب، المجال العسكري، المجال الهندسي و المجال الصناعي. حيث أنها تقوم بأداء المهام التي صممت من أجلها بدقة وكفاءة. بعض من هذه الاستخدامات تتمثل في أداء مهام تتطلب العبور عبر طرق ذات وعورة شديدة والتي من الصعب عبورها أو اجتيازها باستخدام وسائل الحركة الاعتيادية. في هذا المشروع تم تقديم حل لهذه المشكلة وذلك باستخدام الروبوت سداسي الأرجل، وهو عبارة عن روبوت يستخدم ستة أرجل لاجتياز هذه الوعورة مما يسمح بإنجاز المهام التي تتطلب الحركة عبر هذه الطرق الوعرة. تم عمل مقارنة عملية لصنع هذا الروبوت وذلك اعتماداً على البحوث عن الروبوتيات، وأيضاً عن طريق دراسة حركة الروبوتات ومراقبة ميكانيكية الحركة للروبوتات ذات الأرجل ومن ثم تم تصميم الروبوت سداسي الأرجل لاجتياز كل أنواع الطرق الوعرة والتأقلم معها باستخدام أنماط الحركة المختلفة وجعله جاهز للمهام المختلفة.

TABLE OF CONTENTS

	Page No.
الآية	i
DEDICATION	ii
ACKNOWLEDGMENT	iii
ABSTRACT	iv
المستخلص	v
TABLE OF CONTENTS	vi
LIST OF FIGURES	x
LIST OF TABLES	xii
LIST OF ABBREVIATIONS	xiii
CHAPTER ONE	
INTRODUCTION	
1.1 Overview	1
1.2 Problem Statement	1
1.3 Objectives	1
1.4 Methodology	2
1.5 Project Layout	2
CHAPTER TWO	
ROBOTS CONSTRUCTION AND APPLICATIONS	
2.1 Introduction	3
2.2 Robot Construction	3
2.2.1 Body structure	3
2.2.2 Robot actuators	4
2.2.3 Robots sensory	7
2.2.4 Power supply system	8
2.2.5 Brain system	8

2.3 Purposes of Robots	10
2.3.1 Exploration	9
2.3.2 Industrial robots	9
2.3.3 Design and prototyping	10
2.3.4 Fire-fighting robots	10
2.3.5 Maintenance	10
2.3.6 War robots	10
2.3.7 Civilian uses	11
2.3.8 Domestic	11
2.4 Control Systems	11
2.5 Control Techniques	12
CHAPTER THREE	
ROBOTS LOCOMOTION AND APPLICATION	
3.1 Introduction	13
3.2 Types of Robots Locomotion	13
3.2.1 Wheeled robots locomotion	13
3.2.2 Crawler robots locomotion	13
3.2.3 Legged robots locomotion	14
3.2.4 Special types locomotion	14
3.3 The Advantages of Legged Robot Locomotion	14
3.3.1 Mobility	14
3.3.2 Overcoming obstacles	15
3.3.3 Active suspension	16
3.3.4 Energy efficiency	16
3.3.5 Slippage and jamming	16
3.3.6 Natural terrain	16
3.3.7 Environmental damage	16

3.3.8 Average speed	16
3.4 Stability	18
3.5 Speed of a Walking Robot	19
3.6 Hexapods	19
3.7 Hexapods Walking Gaits	20
3.7.1 Wave gait	20
3.7.2 Ripple gait	20
3.7.3 Tripod gait	20
3.8 Potential and Real Uses for Walking Robots	24
3.8.1 Military applications	22
3.8.2 Inspection of nuclear power plants	22
3.8.3 Land, submarine and planetary exploration	22
3.8.4 Forestry and agricultural tasks	22
3.8.5 Construction	23
3.8.6 Help for disabled people	23
3.8.7 Support for AI techniques	23
3.8.8 Study of living creatures	24
3.8.9 Humanitarian de-mining	24
3.8.10 Cargo application	24
3.8.11 Underwater operation	25
3.9 Examples of Existing Legged Robots	25
3.9.1 One-leg hopper	25
3.9.2 Two legged robots	26
3.9.3 Four legged (quadruped) robots	26
3.9.4 The six legged (hexapod) robots	27
3.10 Arduino Mega 2560	29
3.11 SSC-32U Servo Controller	29

3.12 HiTEC HS-645MG Servomotor	30
3.13 LM7806 Voltage Regulator	31
CHAPTER FOUR	
DESIGN AND IMPLEMENTATION OF HEXAPOD ROBOT	
4.1 Introduction	32
4.2 System Components	32
4.3 Robot Platform	33
4.4 Power Supply Circuit	34
4.4.1 MJE13005 transistor	35
4.4.2 Circuit operation	36
4.5 Arduino Connection to SSC-32U	36
4.6 Arduino Connections to PS2 Receiver	37
4.7 Hexapod Movement	38
4.7.1 Legs range of motion	38
4.7.2 Tripod gait movement planning	39
CHAPTER FIVE	
CONCLUSION AND RECOMMENDATIONS	
5.1 Conclusion	41
5.2 Recommendations	41
REFERENCES	42

LIST OF FIGURES

Figure No.	Title	Page No.
2.1	Air muscles	4
2.2	Solenoid	5
2.3	Stepper motor	5
2.4	HiTEC servomotor	6
2.5	DC motor and DC gearhead motor	7
3.1	Mobility	15
3.2	Overcoming an obstacle	15
3.3	Active suspension	16
3.4	Motion in soft terrain	16
3.5	Motion in unpaved surfaces	17
3.6	Environmental effect	17
3.7	Motion in unprepared surfaces	18
3.8	Hexapod walking gaits	21
3.9	Timberjack hexapod robot	23
3.10	One-leg hopper	25
3.11	ASIMO	26
3.12	AIBO	26
3.13	BigDog	27
3.14	RHex	27
3.15	ATHELETE	28
3.16	COMET-IV	28
3.17	Arduino Mega 2560	29
3.18	SSC-32U Servo controller	30
4.1	Upper frame	33

4.2	Lower frame	33
4.3	Leg anatomy	34
4.4	Femur	34
4.5	Tibia	34
4.6	Servo bracket	34
4.7	18650 Lithium-ion battery cell	35
4.8	Common collector circuit	35
4.9	Power supply circuit	36
4.10	Arduino connection to the SSC-32U	37
4.11	Arduino connection to PS2 receiver	38
4.12	Hexapod robot fully assembled	38
4.13	Legs range of motion in degrees	40
4.14	Tripod gait leg grouping	41
4.15	Sleep mode	42
4.16	Idle mode	42
4.17	Hexapod robot walking	42
4.18	Hexapod robot turning	42
4.19	Hexapod maneuvering over various types of terrain	43

LIST OF TABLES

Table No.	Title	Page No.
3.1	HiTEC HS-645MG servomotor specifications	30
4.1	Legs servomotors range of motion in PWM	38

LIST OF ABBREVIATIONS

DC	Direct Current
CAD	Computer Aided Design
CAM	Computer Aided Manufacturing
CNC	Computer Numerical Control
DOF	Degree Of Freedom
COG	Center Of Gravity
PWM	Pulse Width Modulation
PS2	Play Station 2
UART	Universal Asynchronous Receiver Transmitter