

# **TRAIN ROBOT TO CLIMB STAIRS: MOVE ROBOT'S LEGS ON THE STAIRCASE**

21\_22-J 34

Project Proposal Report

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## Declaration

I declare that this is my own work and this proposal does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any other university or Institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

Name	Student ID	Signature
Wijethilaka R.G.K.H	IT18220834	 _____

The above candidate is carrying out research for the undergraduate Dissertation under my supervision.

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Signature of the supervisor:

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Date:

## **Abstract**

To climbing stairs robot, use legs. The main technical issue of robot while climbing stairs is speed. So, sensors are used to move legs same speed with each step.

Then robot identified the height and width of stairs according to the range, it would do some calculations regarding how much distance the legs should move with steps.

It would do some calculations regarding how much the legs should move. After that robot use real-time controller and predict motion control to go to next step of staircase.

Real time controller approach dimension of staircases and motion controller use go to next step of staircase.

Keyword – speed, move, distance, sensors

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# 1. Introduction

## 1.1. Background and literature survey

Technology focuses on the present and the future. Technology has increased productivity in every industry in the world. Therefore, Introduction Robots help and work easier every work. This main purpose of this study is robot move staircases with legs.

When use walking pattern and sensors for it robot have motor that can help to climb staircases databases use to store some temp data for speed of legs , distance of legs, how to manage weight moving legs that data using database

How to man climb staircase that scenario use to climb staircases , how to man walk that pattern how far man legs move climb staircase that ways help that robot climb staircases and these days robot help to people work their work that concept is help to reduce man time and easy for their works .

Every robot can't climb staircases because that is not easy so that robot can easily climb staircases .

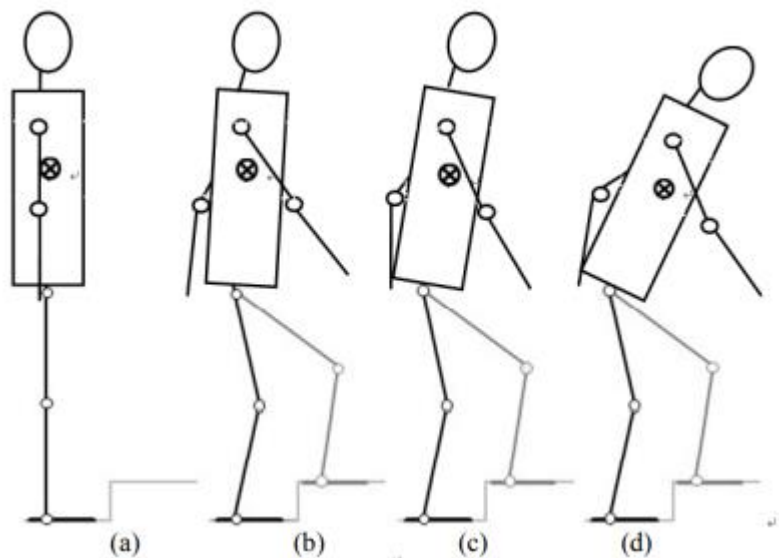


Figure [1]



This one show how to robot climb staircase . robot hip , ankle and knee motors working use sensors like that way robot climb staircase.

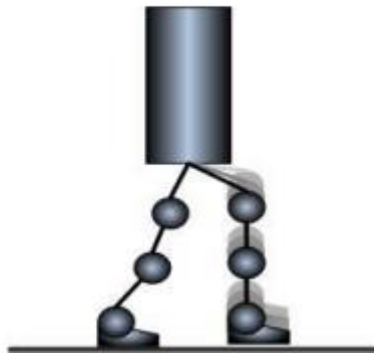


Figure [2]

## Research Gap

There are many research doesn't implements how to climb robot using legs. There have many legs like spider and like a tank using chain systems that types but using same scenario for climb staircases so that things we can consider about it

- **Speed of Legs moving**
- **Distance of legs moving**
- **Which angle Ankle Moving?**

According to the available research papers motion capture system utilized and measure of database and use speed, loads environment. Kinematics method it is used joint of support leg and which position can be prevalent onward kinematics anytime.

Walking pattern every man have walking pattern because they want to move one place to another place so that type walking pattern natural kinematics walking pattern robot use to same scenario go to move another place so how to move like a man that concept this paper have it.

## Comparison of Former Research papers

<b>Research</b>	<b>Speed of Legs moving</b>	<b>Distance of legs moving</b>	<b>Which angle Ankle moving</b>
<b>[1]</b>	No	Yes	Yes
<b>[2]</b>	No	Yes	No
<b>[3]</b>	No	Yes	No
<b>[4]</b>	No	No	Yes
<b>[5]</b>	Yes	Yes	Yes
<b>[6]</b>	Yes	No	Yes
<b>Proposed system</b>	Yes	Yes	Yes

## **Research Problem**

robot is not man and he can't think like man so Research have many question for that first one How to move robot with legs that scenario use natural kinematic walking system for that database can store temp data for that we have use to store that data for database that data can get out use algorithms second one how to control speed between legs that also use same scenario get temp data. Normal climb staircase slowly that data store database for it. It implement robot.

Third one how to correctly move between steps and how to manage distance between legs. Normally step dimension are available database it help to get to know about height and width that can help robot leg how far up distance data also use temp data in the database it help then implement robot correctly move between steps of staircases. Fourth one is how to manage weight between legs it is can't hold one legs whole weight because use database get temp data for this it is easy for how many time robot want to up his leg and control his other leg for easy .

## **2. Objectives**

### **2.1 Main Objectives**

The main objective of this system robot move using legs on the staircases. Robot have two legs the other papers have not that type that papers using many legs and using sensor for climb staircase our project mainly focus function is how to move using legs that type not easy because robot how far leg move , how to manage speed , how to calculate between legs distance that is not easy my main objective is move legs .

### **Specific Objectives**

1. How to move ankle, knee and hip

Data storage store temp data so that data send using algorithm after sensor use start motor then ankle knee and hip work that happened end of staircases

2. How to manage weight between moving legs

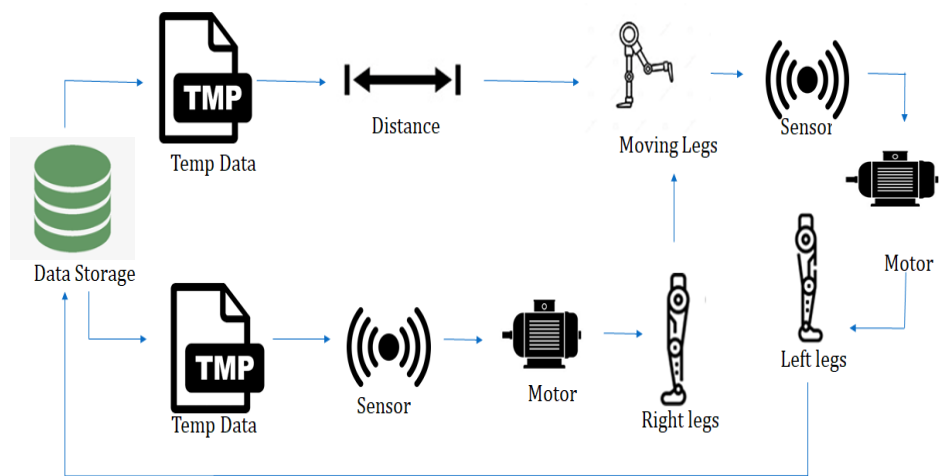
Data storage store temp data that data are send Right leg move after using algorithms

3. How to manage swing in the right direction legs

Head have sensor so that are used for detect staircase that sensor help to get dimension of staircase so that data using robot help which side swing.

4. How to manage speed of legs Normal man climb staircases pattern data use for it that data store on database and help to manage speed of legs .that data use same algorithms and help to move normal speed of legs

## Methodology



Firstly Data storage sends temp data using sensor after work motor therefore right leg move first step.

Again data storage sends temp data for distance

(How far 2<sup>nd</sup> leg move and how much speed of 2<sup>nd</sup> leg)

After move using sensor and motor left leg same scenario

Happened climb staircases.

## Budget and Budget Justification (if any)

Component	Amount (USD)	Amount (LKR)
Frameworks and libraries	Free (0\$)	0 LKR
Internet Package	15\$	1500 LKR
Total	15\$	1500 LKR

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