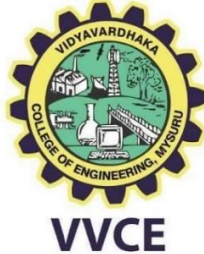# Vidyavardhaka College of Engineering,

**Autonomous Institute, Affiliated to Visveswaraya Technological University, Belagavi.
Accredited by NBA, New Delhi (2017-18 to 2019-20) & NAAC with 'A' Grade
Gokulam 3rd Stage, Mysuru - 570002, Karnataka, India**

A Project Report on

"Voice Recognition Based Lift using Arduino Uno & Voice Recognition Module"

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Finally, we would like to thank our Parents and all our beloved ones for supporting us in many ways that meant.

ABSTRACT

This project presents the design and construction of voice operated lift/elevator control system. This system acts as human-machine communication system. Speech recognition is the process of recognizing the spoken words to take the necessary actions accordingly. User can also control the electrical devices like fan, door etc with the help of voice recognition system. The main purpose of designing this project is to operate the Elevator by using voice commands. This device is very helpful for paralysis, short height people and physically challenged persons.

Contents

INTRODUCTION

❖ Elevator has over the time become an important part of our day to day life.

❖ It is used as an everyday transport device- useful to move goods as well as persons.

❖ In modern word, city and crowded area require multi floor buildings.

❖ According to wheelchair access laws, elevators/lifts are a must requirement in new multi-storied buildings.

❖ The main purpose of this project is to operate elevator by voice command.

❖ Therefore, we have decided to come up with a new idea, which is fascinating as well as helpful.

❖ It is tried to make it more automatic through our project. Speech recognition is the method by which the elevator can be controlled using voice.

❖ Whenever it is dealth with voice control, the first term come in our mind is Speech Recognition.

❖ Speech recognition is a technology in which the system will understand the words but not its meaning of the words.

❖ Speech is a best and ideal method to controlling the elevator. Automatic speech Recognition is a technique by which a computer takes a speech signal and Converts it into words.

BASIC COMPONENTS

| |
|---|
| ❖ Arduino Uno |
| ❖ Breadboard |
| ❖ Stepper Motor |
| ❖ Bluetooth Module |

Arduino Uno

Specifications

- ❖ Microcontroller: ATmega328
- ❖ Operating Voltage: 5V
- ❖ Input Voltage (recommended): 7-12V
- ❖ Input Voltage (limits): 6-20V
- ❖ Digital I/O Pins: 14 (of which 6 provide PWM output)
- ❖ Analog Input Pins: 6
- ❖ DC Current per I/O Pin: 40 mA
- ❖ DC Current for 3.3V Pin: 50 mA
- ❖ Flash Memory: 32 KB of which 0.5 KB used by bootloader
- ❖ SRAM: 2 KB (ATmega328)
- ❖ EEPROM: 1 KB (ATmega328)
- ❖ Clock Speed: 16 MHz
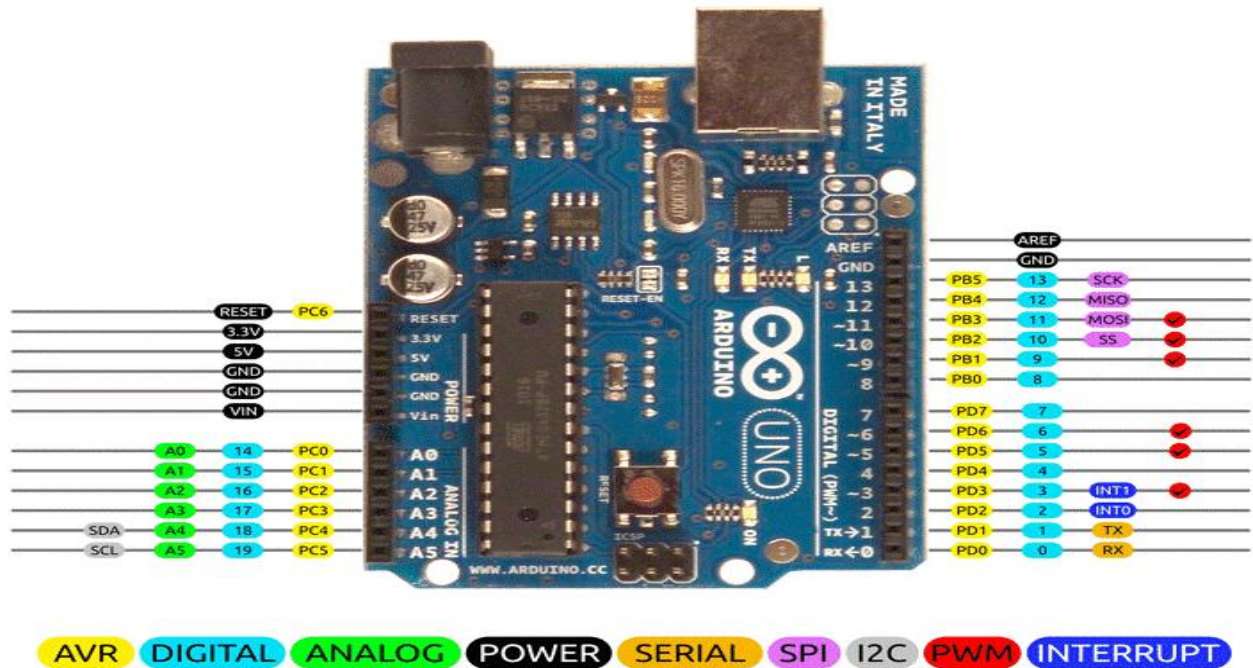
Breadboard

- ❖ 2 Distribution Strips, 200 tie-points.

- ❖ 630 tie-points in IC/ circuit areas.

- ❖ ABS plastic with colour legend.

- ❖ Dimension: 6.5*4.4*0.3 **inch**.

- ❖ Hole/Pitch Style: Square wire holes (2.54mm)

- ❖ ABS heat Distortion Temperature: 84° C (183° F)

- ❖ Rating: 300/3 to 5Amps.

- ❖ Insulation Resistance : 500MΩ / DC500V.
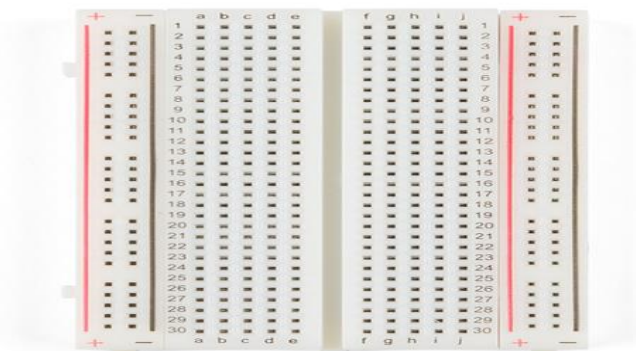
Stepper Motor

NEMA 23 Stepper Motor Specifications

- ❖ Voltage Rating: 3.2V

- ❖ Current Rating: 2.8A

- ❖ Holding Torque: 270 oz. in

- ❖ Step Angle: 1.8 deg.

- ❖ Steps Per Revolution: 200

- ❖ No. of Phases: 4

- ❖ Motor Length: 3.1 inches

- ❖ No. of Leads: 4

- ❖ Inductance Per Phase: 3.6mH
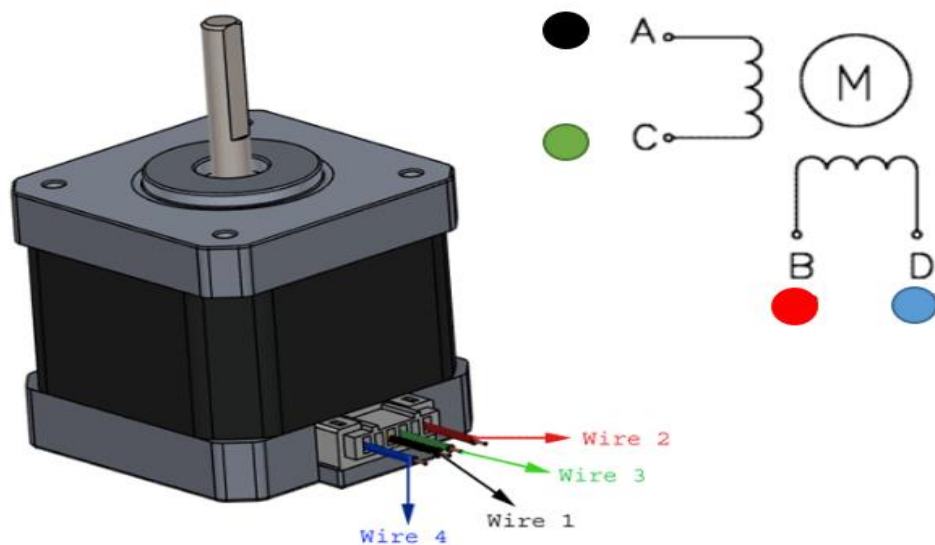

Bluetooth Module

Specifation

- ❖ **Bluetooth** protocal: **Bluetooth Specification** v2. ...

- ❖ Frequency: 2.4GHz ISM band.

- ❖ Modulation: GFSK(Gaussian Frequency Shift Keying)

- ❖ Emission power: ≤4dBm, Class 2.

- ❖ Sensitivity: ≤-84dBm at 0.1% BER.

- ❖ Speed: Asynchronous: 2.1Mbps(Max) / 160 kbps, Synchronous: 1Mbps/1Mbps.

- ❖ Security: Authentication and encryption.

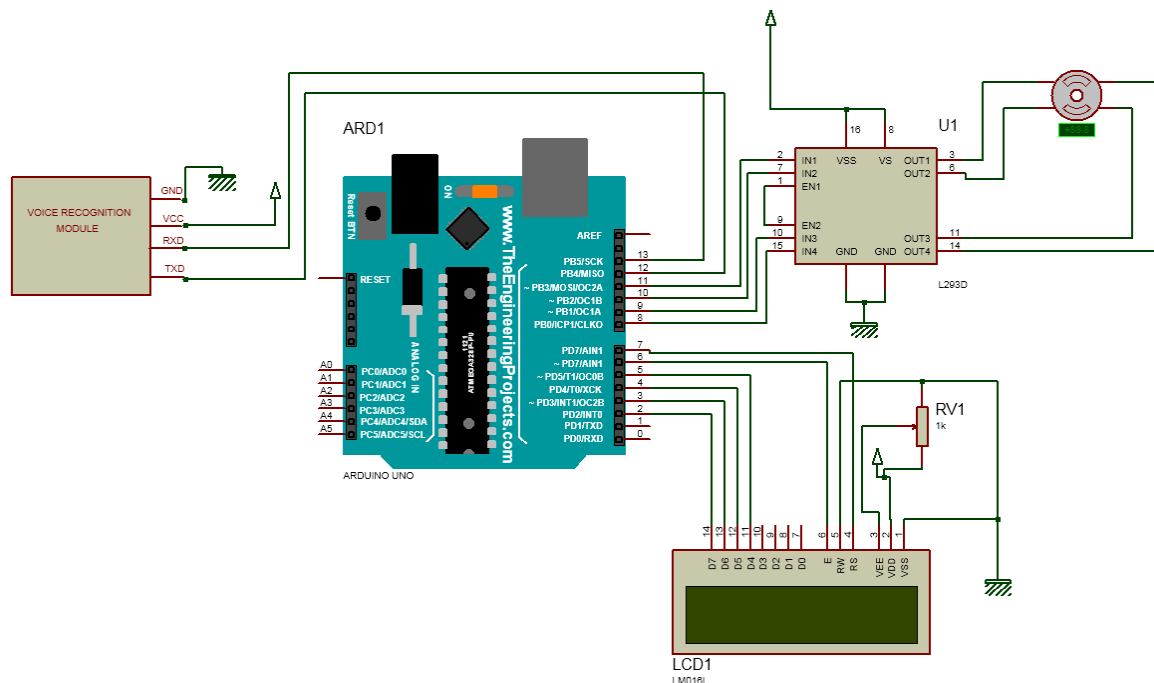# METHODOLOGY & WORKING PRINCIPLE

Block Diagram
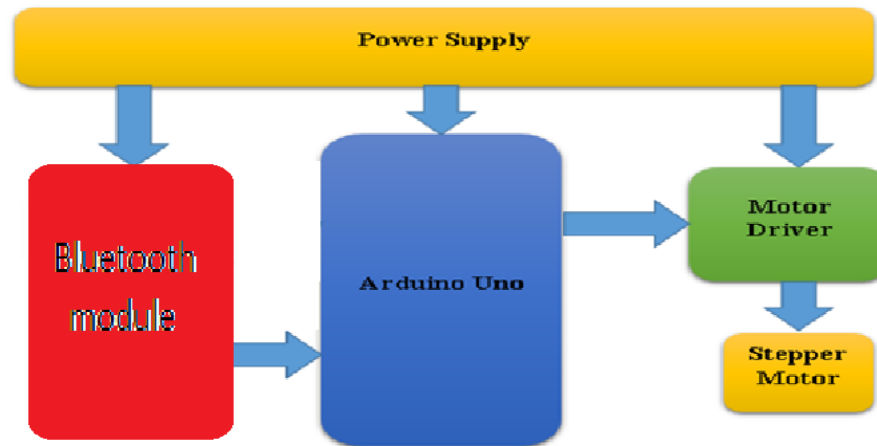
Circuit Diagram

- ❖ When We send our voice command to the voice recognition module, the Module will Send its regarding data to Arduino.

- ❖ Arduino receive the data through voice recognition module and process it.

- ❖ According to the data the Arduino gives signal to the IC L293D.

- ❖ The IC L293D is a motor Driver IC used to Drive the Stepper motor according to the received pulses from Arduino.

- ❖ This system is operated on the basis of voice, so that the voice of any person can be used to control the elevator, the voice signal of any person is converted in to Digital binary by Voice module V2.

- ❖ The programed Arduino uno board uses that binary code and give proper task to stepper motor.

- ❖ LCD is to display the present status of the lift.

- ❖ When any person entered into lift and if he say floor1 , floor 2, ground floor etc. commands then lift will go to appropriate positions.

- ❖ When person say floor 1 then mic attached to voice module receives that physical voice signal and convert it into electrical signal this electrical signal is then processed by voice module and convert into binary.

- ❖ This binary signal is sent to Arduino microcontroller (ATmega382) which gives command to stepper motor to rotate and go to floor 1.

- ❖ As well as microcontroller also sends command to LCD to display recent position of floor.

- ❖ To control 12v stepper motor Arduino not able to produce that much voltage and current so a another circuit is require that names driver. Here we use l293d motor driver to drive stepper motor.

COST ESTIMATION

Sl no.	Particulars	Quantity	Total price (INR)
1	Arduino UNO R3 board	1	680
2	IR sensor	1	70
3	Stepper motor	1	200
4	Stepper motor driver	1	100
5	Jumper wires	Lump sum	80
6	Bluetooth module	1	240
		TOTAL	1370

CONCLUSION

❖ The voice-controlled elevator is of a great use as it works effortlessly.

❖ This project tries to throw a light on voice recognition system, which can be used to modify the conventional elevator and make it more efficient and usable for physically challenged people.

❖ The prototype of elevator is useful instrument for research in specialization of voice signal acknowledgment, computerization and control advances as well useful in finding potential applications in this field.

❖ This project acts as a human-machine communication system.

SCOPE FOR FUTURE WORK

The performance parameters can be sufficiently improved if it is planned to be a real world solution.

The suggested improvements that can be performed are,

- ❖ Usage of Servo Motor instead of Stepper Motor, so that all parameters are within our control and so we can modify them easily.
- ❖ Usage of a high-end Controller, so that high speeds and dedicated technologies could be delivered.
- ❖ Usage of multiple command based systems, using speech plus button and inclusion of a few sensors to improve result.

Applications

- ❖ It is used as an everyday transport device- useful to move goods as well as persons.
- ❖ In modern word, city and crowded area require multi floor buildings.
- ❖ According to wheelchair access laws, elevators/lifts are a must requirement in new multi-storied buildings.
- ❖ For Paralyzed people: It can use for paralyzed people to move from one place to other place. It can use for those people who handicapped their hand, eye etc.
- ❖ For Home Automation: It can be used in-home automation to control Fans, light other home appliances.
- ❖ For military: It is used in army when the soldiers can't enter into some restricted area.
- ❖ For Industry: It can be used in industry to move the object from one place to another.

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