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Voice-Operated Intelligent elevator using Arduino

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ABSTRACT- The Elevator has over time become an integral part of oour daily lives. It is used as a daily commute device to move goodsand people. The main purpose of this project is to cash by voice command. This project works on the basis of voice, which can help short people, people with disabilities or young people to move from one place to another without the help of someone else. The use of a microcontroller to control different devices and integrate each module, namely voice module, motor module. Motors are used to move the lift up and down as per the request from the user. Voice module is used to take the request from the user. Request from user can be in any language. The input then can be translated into English using translator which will be coded into the microcontroller.

KEYWORDS *:* Arduinoo Microcontroller, Smart Elevator, Motor driver, Motor, IR Sensor

I.INTRODUCTION

An elevator is a type of cable-assisted, hydraulic cylinder-assisted machine, or roller-track track that carries people vertically or horizontally between floors, levels, or decks of a building, ship, or other structure. They are usually powered by electric motors that drive grains and anti-weight systems such as a heist, although some liquids pump water that uses water to lift a cylindrical piston like a jug.

Elevator is important for patients, guests, guardians, small children, visitors. It makes oour life easier; lets us work and go to different floors faster, allows us to transport goods with ease, and helps us feel comfortable and relaxed all throughout the ride.

But usage of elevators by physically handicapped people, people with short height, or dwarf people has always been a difficult task. And even in this covid situation where touching commonly used surfaces which can spread the disease brings great threat to a person's life.

Manual work which might give an ease to the user to achieve their destined floor throughout peak hours and can conjointly provides a ease to physically-challenged individuals. Elevators are controller devices that use switch mechanism for operation. Either the person wishes to travel in down or upward direction, uses the computer keyboard or perhaps for Associate in emergency stop or to open & shut the elevator door. In today's life we will notice a colossal kind of housing complexes packed in procurable location with multi-storage building capability. This project higher fits for blind, unfit and physically challenged people. trying towards current scenarioo of CoVID-19.Manually ooperated elevate encompasses a high rate of spreading the virus. The essential explanation for planning this method is to perform elevator operation via voice directions. Speech recognition systems are the crucial a part of the project. The speech recognition of the elevator system permits the communication mechanism between the user and alsoo the Arduinoo primarily based mechanism.

In the previous implementation, we have observed different methods of implementing voice-controlled using DWT technique, artificial intelligence, sphinx library, microphones, speakers.

DWT being effective at one side, it was very difficult or complex to implement in the real world. It is a technique to understand the statement even if spoken at different pace or pitch. It has ability to differentiate multiple statement at oonce.But as discussed it is very difficult to implement.

on the oother side artificial intelligence requires a larger size of hardware as it needs to store lmore data so that it can learn continuously from previous data inputs. Hence it is a drawback for the system.

Sphinx library works same as the artificial intelligence and requires a large data storage area. As observed this was particularly used for elevators with maximum 2 floors as the

inputs that the system decoded was oonly 'up' and 'down'.

And in the speaker implementation of the voice elevator, it was difficult to take the input because it could not differentiate multiple inputs at once and each person had to speak one by one. It took too much time for taking all the inputs which delayed the process.

So, our project aims to solve all the above problems by adding a new feature to the elevator, which is taking input by voice. Input can be in words like floor number, or direction (Up or Down).

Elevator can be used by the public everywhere, they can also be used to permit use only to certain certified people to avoid misuse or for emergencies. Hence we have implemented voice-operated elevator using Bluetooth module. For the prototype the components that we are going to use are Arduino uno, DC motor, motor driver, IR sensors, Bluetooth module. Also we are going to use an mobile application to communicate with the interface of the Lift.

Arduino act as the brain of the complete system which will be responsible for the processing of the input and output of data.

Motor driver is responsible for taking input from the Arduino and rotate clockwise or anti clockwise according to the requirement.

IR sensors are placed at each floor to detect the presence of lift i.e it tell us at which floor the lift is present. Bluetooth module is responsible for taking input from the user and pass it to the Arduino for the further processing of the data.

II. LITERATURE SURVEY

In December 2016, D. Meenatchi, R. Aishwarya, A.Shashina[1] published a paper titled "A voice Recognizing Elevator System". The paper proposes a voice-controlled, simulated elevator system for the benefit of differently-abled persons, such as those who are visually impaired or are paraplegics. They have used a java-based library that implements artificial Intelligence. The only drawback of this system is learning curve of the machine is very low and it requires a larger size of the database to store all the data inputs from the users.

In 2018, Archana Mahajan, Divya Patil, and Aswini Pawar[2] published a paper titled "Voice operated Lift/Elevator in Emergency". This project presents the design and construction of a voice-operated lift/elevator control system. This system acts as the human-machine communication system. Speech recognition is a technique in which a machine understands the words but not the context of the words spoken to a speech recognition module by any individual. The only drawback in the system is in this the module recognizes only few registered words which were already coded into the microcontroller.

In December 2019, Rajiya Khan, Shehzeen Shaikh, Shaista Khan[3] published a paper titled "Voice Automation For Elevator". The paper tells us about the Dynamic Time Wrapping Technique. It consists of words such as up, down, etc. The speech recognition system is the main part of this project along with this microcontroller, motor etc. also plays an important role. Implementing the DWT is a complex process and it recognizes only commands like up, down, etc.

In September 2020 ,B.K. Srilatha and B. Reeshma[4] published a paper titled "Automated elevator-an attentive elevator to elevate using speech recognition". They have mainly worked on speed control of elevator. A very efficient way of providing speed control by using PWM was implemented. Pulse width modulation is a type of modulation in digital signals, using pulse width modulation, we can modify the duty cycles, effectively changing the speed of the elevator motor. The method used in this paper is reliable and variable speed can be implemented easily using this. They have used a very basic way of the voice recognizing as the main goal they wanted to achieve speed control of the elevator.

III. PROPOSED SYSTEM

The proposed system in this project is to cash by voice command. This project works using Bluetooth technology which establishes a connection between the elevators interface and users mobile. This system can be used in both secured places and public places.

Using Arduino microcontroller makes it more efficient as it can process 32bits at a time which makes the process faster. It can take multiple inputs at a time because the inputs will be from

user phones and there will be no miss match or the ooverlappingof the voices of the users.

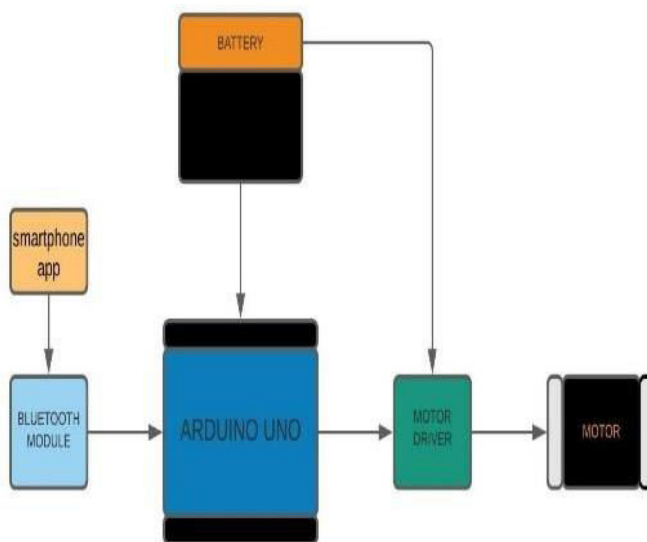Block diagram of voice controlled elevator:

Fig 1: Block diagram of voice controlled elevator

Block diagram consists of the components used in the project. It contains battery to supply power to every component in the system. Every system gets driven by the power consumed from the battery. It contains Arduino Uno a microcontroller to for processing and maintaining the input and output peripherals. Itprocesses the commands from the user and controls the elements connected to it. Here, the whole process starts from the Bluetooth application. In the user side, a Bluetooth application is installed and commands are given as inputs which in turn received by the Bluetooth module. Bluetooth module sends the information or commands received from the user to the Arduino uno microcontroller. Now, Motor driver is connected directly to the Arduino uno and controls the DC motors. At last, the processed information is used to move the elevator the floor number as required by the user. IR sensors areused to find the initial position of the lift.

Flow chart of voice controlled elevator:
This flowchart describes about the working of our developed voice controlled elevator. Input is taken from the IR sensor to find the current position of the lift and then the user input is taken to know which floor he wants to travel to. A list of inputsis created and then with respect to the current position of the liftand the first input of the user.
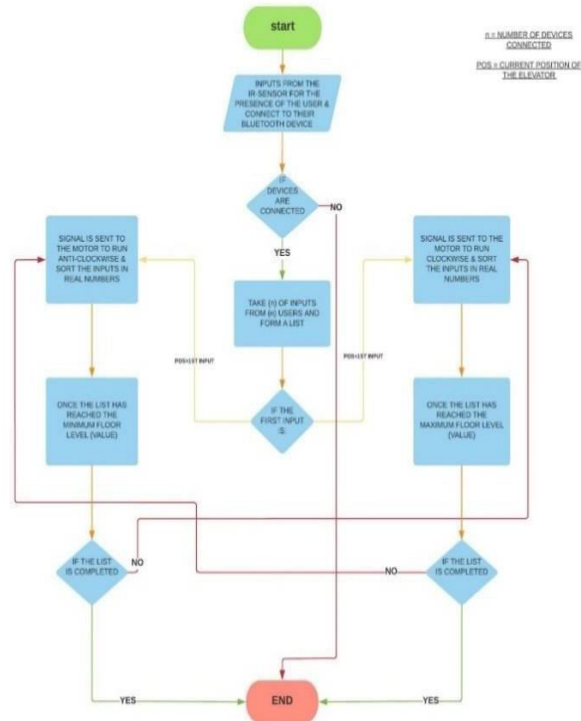
Fig 2: Flow chart of voice controlled elevator

The required information is sent to motor driver and then motordriver rotates the DC motor clock wise or anticlockwise to makethe lift move up or down until all the numbers from the list hasbeen visited.
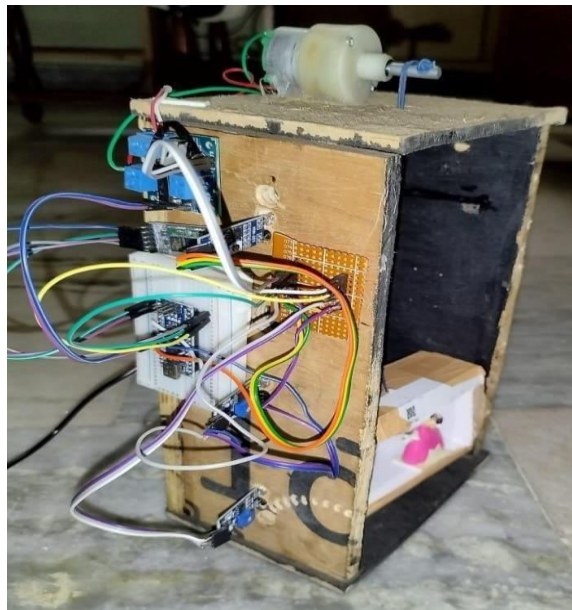
IV. RESULT
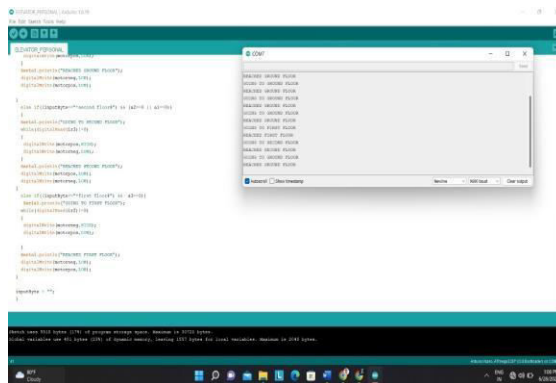

Fig 3: Prototype of design

Fig 4: Output of voice controlled elevator

V.CONCLUSION

The voice-controlled elevator is of great use. This project tries to throw light on the voice recognition system which can be used to modify the conventional elevator and make it more efficient and usable for physically challenged people. This implementation brings together all the features which can be needed to make sure that the services provided by it make the system independent. It will provide ease to the user for using the elevator service and would also provide great benefit to physically-impaired people thereby resolving their dependencies on other for using the elevator. It resolves the issue of pressing the switches all the time for moving up or down which becomes quite difficult in crowded hours.

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