Speech Controlled Wireless Elevator System

[1]S.S.Patil, [2]Bhavesh Patkar, [3]Arunkumar Padyachi, [4]Tushar Patil

[1]Assistant Professor, [234]B.E. IV
[1234]Electronics and Telecommunication Engineering,
[1234]Bharati Vidyapeeth College of Engineering, Navi Mumbai, India

Abstract: Elevators are controller devices that uses switch mechanism for operation. Either the person desires to go in down or upward direction uses the keypad or even for an emergency stop or to open & close the elevator door. In today's life we can find vast variety of apartment complex crowded in close by location with multi storage building capacity. This project better fits for blind, paralyzed and physically challenged individuals, as well as regular individuals to move from one floor to other without the use of switches. The essential cause of designing this system is to perform elevator operation via voice instructions. Speech recognition system is the crucial part of the project. The speech recognition of the elevator system allows the communication mechanism between the user and the Arduino based mechanism.

Index Terms - **Arduino, Elevator, Speech recognition, Motor.**

I. INTRODUCTION

With the increase of high-rise buildings, there has been increasing demand for elevator system. It is used on daily basis as a transport device for people as well as for moving goods. Elevator is an important part of everyone's daily life living in big buildings or any huge property having large number of floors. Elevator is an exceedingly useful device that moves individuals in the shortest amount of time to required floor.

In present situation elevator has become an important part of our daily life. We are aiming to make it more convenient through our proposed work. The main objective of the proposed system is to design and implement a speech operated elevator system. Speech recognition can be explained as the process of identifying the uttered words to take the required action accordingly. Speech is a great and ideal approach for controlling the elevator. Speech recognition system provides the communication between the control mechanism and the user. The system uses DC motors for operating the elevator according to the voice command. Embedded C programming language is used for Arduino programming. The Arduino communicates with all input and output ports. The input to the Arduino is the voice recognition system, it takes the user voice instructions as input and then the controller decides if the instruction is to move in upward or downward direction, and according to the users command the control mechanism moves the lift. For visual information LCD display is made available.

The main objectives of the proposed system are:
1. Voice based command operation of the elevator.
2. Voice based operation of device in lift.
3. To avoid physical contact with the elevator.

II. RELATED WORK

Huggins-Daines explained the accessibility of real-time continual speech recognition on cell phones and embedded gadgets and the technical challenges of computational requirements of continuous speech recognition. In this paper they have presented work on porting and development of CMU SPHINX-II, a largely used non-proprietary large vocabulary continual speech recognition (LVCSR) system, for portable devices.[1]

P. Cernys, V. Kubilius reports the study of voice and sensor-controlled lift model in this paper. The structure is build with the help of standard powered controller; it includes speech recognition system, configurable ports and

analytical lift program, which links all of them. The moderation of the popular DTW (Dynamic Time Warping) process was used.[2]

Zhang Yajun presented a control model for lift positioning. The structure is build with the help of AT89S52 microcontroller. The structural model gives an instinctive and in-depth explanation for fabrication and ideal concept of elevator and provides a base for future research of the new elevator control technologies.[3]

This paper Athanaselis, T., talk about the development of voice recognition when additional noise is present, when we use a method of signal amplification. This article looks after the comparison of the SVD-based noise eradication method with the Non-Linear Spectrum method so that to improve weakened speech before it is given to the speech recognition system.[4]

III. PROPOSED SYSTEM

The proposed system consists of mainly two components viz., speech recognition system and Arduino. The main part of the project is the speech recognition system. The exchange of instruction from the user to the control mechanism is delivered by the speech recognition system. Arduino is competent to communicate with all input and output devices simultaneously. To move the elevator in upward or downward direction according to the given user command DC motors are used. Embedded C programming is used to program the Arduino. The input voice module to the Arduino is the speech recognition system. The Arduino receives the voice command specified by the user as input. The controller decides if the command for the lift is to move in upward direction or downward direction, and the control mechanism moves the elevator according to the user's command. IR sensors are provided for continuous monitoring of the elevator floor position. According to the input from the IR sensors the Arduino decides which lift to be moved to the desired floor. In the proposed system, corroboration of the working of an elevator model is shown with the help of Arduino Board and with speech recognition module For visual information of the performed task LCD display is made available.
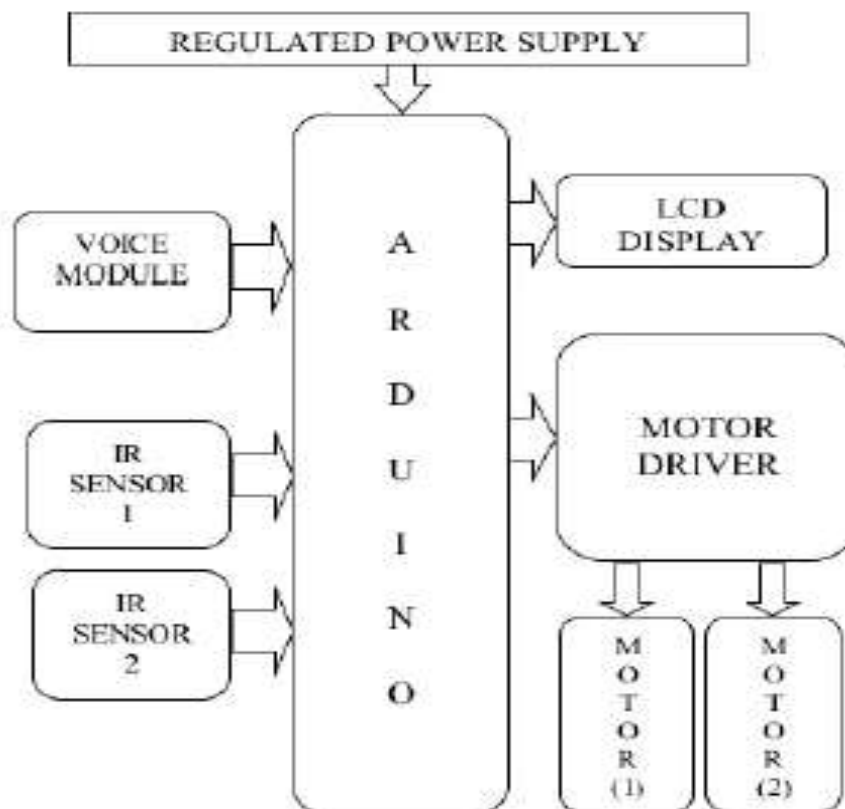
IV. BLOCK DIAGRAM

Fig.1 Block Diagram

V. IMPLEMENTATION

We have utilized Arduino for processing the instruction and added components such as speech recognition kit along with IR sensors, motor driver and LCD display. After power on the Arduino initialized the LCD and turns off the motor. The voice command given by the user are received by the speech recognition kit. IR sensors are placed behind the elevators for continuous monitoring of the elevator floor position.

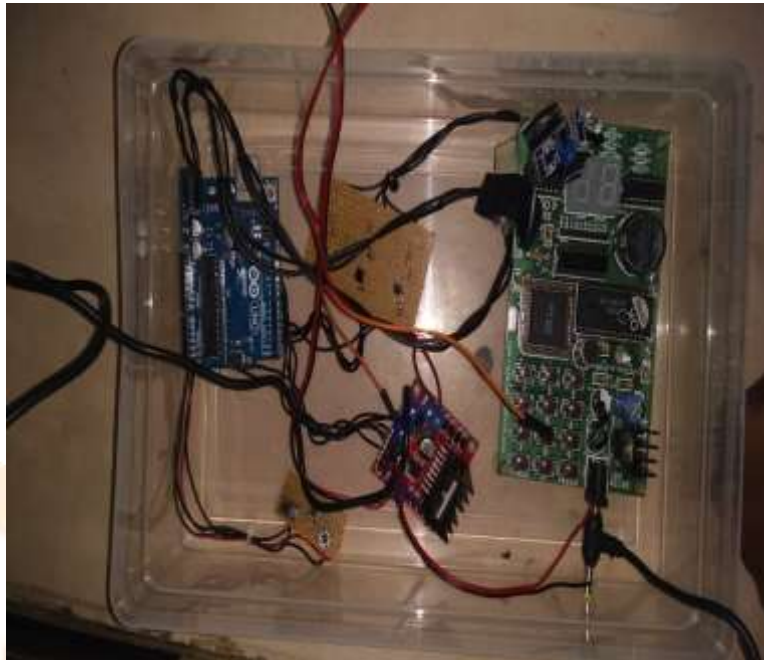Fig.2 Elevator Model   Fig.3 Implemented Circuit

Speech recognition kit accepts voice command through microphone. It analyzes the analog signal and compare it with prestored data in external RAM, then it processes the command and give it to the Arduino. The Arduino then receives the instruction from voice recognition kit and decides whether to move the elevator in upward or downward direction. DC motors of 100rpm are used for the motion of the elevator. Judging from the IR sensor data the Arduino decides which lift is closer to the user's location and move the elevator accordingly. The LCD display gives the floor positioning.

VI. RESULT

By using the speech recognition module, we have been able to eliminate the use of the keypad. Since the speech recognition module transform the spoken words into orders that the Arduino could comprehend. As for an example if the user said TWO the voice recognition module will transform that spoken word into 2 which is a trigger in the code of the proposed system, then the microcontroller will send the word 2 through the motor driver then it will start motor until it reaches 2nd floor .

VII. CONCLUSION

Speech recognition system are available for application purpose for quite some period time, but they have not been used for their full potential. Speech Controlled Elevator System can be implemented on a large scale as a replacement for the traditional elevator system to make it more effective and serviceable for disabled people. The proposed prototype model of elevator serves as a base for understanding voice signal recognition, mechanization and control advances as well as finding possible application in related filed.

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