

Voice Control Smart Lift

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Abstract— The proposed system, which will be useful for people with disabilities, will be specific lifts that are limited by voice. Disability is someone who does not have a complete hand organ or hand organs but does not function properly, but the person can still use voice to control the elevator. The research intends to develop elevator control systems which can be controlled by voice using speech recognition technology and machine learning. Speech Recognition is a system that functions to convert spoken language into input data. The system input is human speech. For the input of data for control equipment, the System will be able to detect spoken words. A precise word is required to control the equipment, and there are only a few words you can recognize. The systems proposed are usually more reliable and easy to learn, yet they fail to detect words beyond the vocabulary taught.

Keywords— speech recognition, elevator, voice control.

I. INTRODUCTION

The elevator has become an integral part of our daily lives, serving as a means to vertically transport goods and people in high-rise buildings such as shopping centers, offices, and hotels. This device efficiently transports individuals to their desired floors in minimal time. Nowadays, elevators have become a ubiquitous mode of transportation, widely used for vertical movement in various settings. They play a crucial role in our lives, particularly in large structures where they facilitate movement between different levels. In today's society, elevators are indispensable in shopping malls, markets, schools, hospitals, and hotels. As automation and ease of operation are increasingly valued, there is a growing demand for more automated and user-friendly machinery and electronic devices.

It is common for people to adhere to established protocols without considering the potential for innovation based on their own capabilities. The desire for increased automation continues to persist, leading individuals to rely heavily on digital devices and conform to their instructions. However, as technological advancements progress, the reliability of some

inventions has diminished. Certain devices are not portable and require significant effort to operate effectively. In light of these challenges, we have conceived an intriguing and practical new idea to address these issues. [1]

II. Literature Survey

We have developed a voice-operated elevator, which is easy to use and particularly beneficial for individuals with disabilities, especially the visually impaired. This elevator operates through voice commands, reducing maintenance costs associated with keypads. By utilizing a voice recognition program connected to the elevator controller, the necessary commands for elevator control are supplied, optimizing its operation. Traditional elevators had drawbacks such as key press issues and increased time required for input. The voice-operated elevator saves time by eliminating these issues. It is especially advantageous for individuals who lack full use of their limbs or other body organs. In the current elevator systems, individuals must push buttons for the desired floor, or keypads are available in the elevator panel room [6]. The human voice operates within the Audio Frequency (AF) range, which spans from 300 Hz to 3500 Hz. One hertz represents one wave per second, and one kilohertz (kHz) is equivalent to 1000 Hz or 1000 waves per second.

Although voice recognition systems have been on the market for some time, they have not yet reached their full potential. Voice-controlled systems are particularly useful for disabled individuals. By employing a speaker-dependent projection-based recognition algorithm, accurate recognition of voice commands is ensured. The recognition accuracy can be further enhanced by increasing the number of references and selecting acoustically distinct voice commands. References can be collected from multiple speakers and averaged. This approach can transform the presented recognition algorithm into a "multi-speaker independent" one. [2]

III. BLOCK DIAGRAM AND WORKING

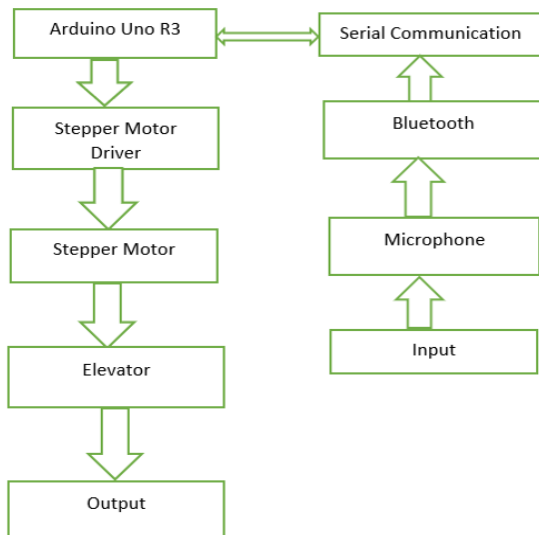


Fig.1 Block Diagram

When We send our voice command through the app Voice bot to Bluetooth module, the Module will send its regarding data to Arduino. Arduino receive the data through Bluetooth module and process it. According to the data the Arduino gives signal to the IC L298N. The IC L298N 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 programed Arduino Uno board uses that binary code and give proper task to stepper motor. When any person entered into lift and if he say floor1, floor2 and 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 which gives command to stepper motor to rotate and go to floo1. 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 L298N motor driver to drive stepper motor. [3]

A. DESIGN

1. **Hardware Setup:** Connect the Bluetooth module to the Arduino Uno R3. This will enable wireless communication between the lift control system and external devices such as smartphones or tablets for voice command input. Connect the motor driver to the Arduino Uno R3. The motor driver will control the stepper motor's movement based on the received

- commands. Connect the stepper motor to the motor driver. The stepper motor will be responsible for moving the lift car. Ensure all connections are secure and follow the pin configuration specified by the components' datasheets.
2. **Voice Recognition and Control:** Use a voice recognition library or module compatible with the Arduino Uno R3, such as the Easy VR Shield or a speech recognition module. Train the voice recognition system with a set of voice commands relevant to lift operations, such as "Go to floor X," "Open doors" or "Close doors." Program the Arduino Uno R3 to listen for voice commands from the Bluetooth module and process the recognized commands. Implement logic in the Arduino code to map the recognized voice commands to the corresponding actions, such as controlling the motor driver to move the lift to the specified floor or open/close the lift doors.
4. **Power Supply:** Ensure you have a stable power supply for the Arduino Uno R3, motor driver, and stepper motor. Consider using separate power sources for the Arduino and motor components to prevent voltage fluctuations and interference.
5. **Safety Features:** Incorporate safety measures such as limit switches to detect the upper and lower floors, preventing the motor from moving beyond those limits. Implement emergency stop functionality that can be triggered by a specific voice command or a physical button. [5]

Conclusion

The voice recognition systems available on the market have not yet reached their full potential. However, in this paper, we have harnessed their potential and reliability. By utilizing a voice recognition program connected to the controller, a significant number of commands required for lift control can be supplied. This model of a lift serves as a valuable tool for training students in automation, voice signal recognition, control technologies, and for enhancing the qualifications of specialists in similar fields.

Voice-controlled systems are particularly beneficial for individuals with disabilities. A speaker-dependent projection-based recognition algorithm ensures a satisfactory level of accuracy in recognizing voice commands. This accuracy can be further improved by increasing the number of references and selecting voice commands with distinct acoustic characteristics. Through these enhancements, the presented recognition algorithm can be transformed into a "multi-speaker independent" system. [6]

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