

# Elevator Control Using Speech Recognition For People With Physical Disabilities

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**Abstract-** This proposed system will that can be useful for people with incapacities, to be specific lifts constrained by voice. The research combines speech recognition technology with machine learning to make the elevator control equipment that can be controlled by voice. Speech Recognition is a system that functions to convert spoken language into input data. The system input is human speech. Control of this hardware requires an exact word and can only recognize some words. These proposed systems are usually more accurate and more easily trained, but could not recognize words that are beyond vocabulary ever taught. This system uses a python programming language and machine learning libraries with Raspberry pi 3B+. The word can be trained for more than hundreds of words.

**Keywords-** Raspberry Pi 3B+, speech recognition, elevator, Machine Learning.

## I. INTRODUCTION

In this rapid world of innovation where a voice starts, its time of domination to replace the touch screens from smartphones to huge computer systems, bringing voice in day-to-day affairs becomes significant. Elevators is one of the system which is used in daily life serves this purpose of making future generations hands free which also becomes a advantage for the disabled.

The essential working guideline of the lift depends on the elevator algorithm, where a lift can choose to stop dependent on two conditions. The elevator is generally made up of cables, motor, pulleys based on traction, climbing, or hydraulic system. To serve project purposes it can also be designed by connecting the elevator system to a raspberry pi to accept input voice. The voice control option is attractive for several reasons. It is potentially appropriate for a large number of elevator users since the system can be used by any individual capable of consistent and distinguishable vocalization [7]. Voice control also reduces physical requirements. However, the recognition accuracy of the Automatic Speech Recognition (ASR) system is a constraint in the deployment of many voice-controlled systems in a real-world application.

In this proposed architecture, a voice-operated elevator system is proposed where the user's input commands to control the movement of the elevator system are kept convenient for the users. The commands include voice input for the floor operations, elevator door operation, and a special option for a call of speaker's choice in case of any unexpected event that requires immediate action.

The paper is organized as follows: Section II mentions briefly a review of some of the related earlier works. Section III describes proposed architecture for this project and also explains various features of speech recognition. Section IV explains the experimental setup for the proposed model. Section V discusses the experimental results that are obtained on performing the tests under laboratory conditions.

## Ease of Use

This system is speech recognition based user friendly.

This system involves touchless interfacing. The presence of human outside elevator will be detected by motion sensors and door will open.

Now human has to tell floor number by voice command. After receiving it, processing will be performed internally.

After successful detection of destination floor, the lift will operate and reach the floor.

## II. LITERATURE SURVEY

Speech recognition have been effectively considered since the 1950s, however late improvements in Personal Computer (PC) and telecommunication technology have magnified speech recognition abilities [1]. From a valuable viewpoint, discourse acknowledgment has handled issues, improved advantages, and purchased a more leading transformation in the current situation [1]. The function of a push-button can be effectively replaced by the Voice control [2]. Speech recognition is a very complex issue. It includes many calculations that oblige high computational necessities [2]. The combination of the utilization of programmed speech recognition systems, human PC interfaces, telephony, or

robotics have managed the exploration of a vast academic group over decades ago [3]. In various areas such as medical transcription, game control, call center dialogue systems, data recovery Automatic speech recognition is frequently used [4]. This automatic speech recognition process is used in most voice-controlled systems. The voice-controlled wheelchair for the physically challenged was proposed in 2002 [7]. This paper had portrayed an investigation that thought about the presentation of abled and impaired individuals utilizing voice control to work a force wheelchair both with and without route help, where the navigations were assisted by the sensors to identify and avoid obstacles in the wheelchair's path [7].

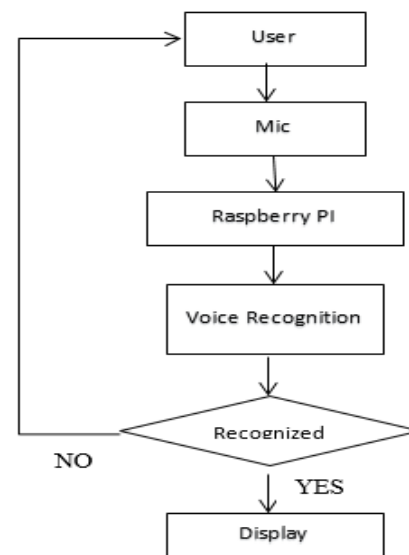
The intelligent elevator control model that uses voice recognition was proposed in 2003 [8]. This proposed elevator system had been controlled by speech and sensor panel [8]. The modification of the renowned DTW (Dynamic Time Warping) algorithm was used [8]. The set of various voice commands for the model consisted of eight Lithuanian words [8]. The model was specifically designed for the convenience of the people.

### III. OBJECTIVES OF THIS PROJECT

1. Make it convenient for people who are handicap.
2. Speech recognition system based user-friendly interfacing.
3. Integration of data for smart report generation for future.
4. To highlight use of voice operated lift.
5. The main objective of this project is to design and construct speech operated elevator control system.

### IV. FLOWCHART FOR SYSTEM

4.1 Flowchart for Speech recognized Voice system.



### Hardware requirement

1. Controller – Raspberry Pi 3B+
2. Sensor – Microphone, Motion Sensors(Optional)
3. Power Supply (12v DC)
4. Other – Speaker, Display

### Software requirement

1. Programming language – Python
2. Tool – PyCharm, PuTTY, WinSCP
3. Protocol – MQTT / HTTP
4. Cloud – Amazon AWS
5. Web – HTML, CSS, JavaScript, Bootstrap, Flask

### Advantages

1. Avoid spread of corona virus
2. Voice / touchless interface
3. Easy for blind and handicap person

### Existing System Limitations

1. No touchless Interface
2. Difficult for handicap and blind people to operate.
3. Metal switches - Transmission risk can also breach high from the utility buttons and metal surfaces

### Applications

This system will be beneficial in the commercial buildings, large towers, residential buildings, etc.

## V. CONCLUSION

This paper explains how voice control can become a boon in the future in everyday life utilizing an elevator simulation. The proposed work shows the practicability of developing an elevator system based on voice control. It also includes a voice feedback system in placing emergency calls, which helps the user to validate the correctness of the number. In the future, the size of the experiment can be improvised to make this model a real-time system. Also, the accuracy can be maximized by making the speech recognition system speaker-dependent also by including the aspect of robustness to noise.

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