IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 10, Issue 12, December 2023

DOI: 10.17148/IARJSET.2023.101208

SMART ELEVATOR

Varsha N[1], Ramya T[2], Neha Nagraj Airani[3]

4th year students Department of ECE, KSIT, Bengaluru, India[1-3]

Abstract: This paper presents the design and construction of a voice operated elevator control system. As we normally see an elevator which might not deal with many safety issues, this system acts as a human-machine communication system. Speech recognition is the process of recognizing the spoken words to take the necessary actions accordingly. Users can also control the electrical devices like fan, door etc. with the help of voice recognition system. This system is extremely beneficial to those who are paralyzed, limited of stature, or severely impaired. The idea for this project is elevator system that accepts destination input via use an external microphone to ride the elevator there target accordingly. The elevator also receives the following inputs: Easy-to-use speed control for different users People with disabilities. With this system, residence and Commercial facilities to minimize elevator costs. Thus, elevator provides experience for people with disabilities and short stature people.

Keywords: Voice control, voice input, microphone, automated elevator, disabled friendly.

I. INTRODUCTION

Elevator system is common but voice-based elevator system is one of the rarest approaches to serve the humanity. Voice based elevator control system acts as a communication system between humans and machines. Speech recognition is the process of recognizing spoken words. We will take necessary measures accordingly. Users can also control electrical equipment such as fans and doors using their voice. Voice recognition system is extreme beneficial for people with paralysis or limited height or people with severe disabilities. Elevators are very common in most places. Elevator usage is increasing in many areas uses such as square measure for carrying around vertical transportation of products and people in high-rise buildings, etc. Offices, search center and alternative skyscrapers and as technology advances, the need for it increases the number of devices is increasing every day. So, this project Emphasis is placed on the design and modernization of existing elevators infrastructure that remembers voice commands. Automatic speech recognition is a method of converting speech. A computer is used to convert audio signals into words. These words are in turn used by microcontroller to provide acceptable results instructions to all connected devices. With support for people with disabilities will also be enhanced. Ensuring contactless transportation of people and goods in elevators by accepting input via voice commands, i.e. It is also beneficial in times of COVID-19.

I. LITERATURE SURVEY

This paper 1 focuses on voice recognition project. The speech recognition model is elevator control, and from this model, you can control the elevator by receiving feedback. When we are thinking about the first concept to appear: voice control what I'm thinking of is voice recognition. Machines must be able to recognize and interpret human's speech as input to a speech recognition model. Voice recognition is done by machines I can understand the words, but I can't understand the context of the words. Anyone can speak using the speech recognition module.[1]

The arduino microcontroller works checking all input ports ensures proper connectivity. The same applies to the power connections for the outputs of the pins. This can be used to connect with external devices. Arduino you can run the program using the software. Programs and software workwith C and C programs. C++ programming language. These programs can be used to upload to the Arduino microcontroller. What I noticed here is that this is a very efficient method of deployment. Speed control is implemented using PWM. Pulse width modulation is a type of modulation in the digital domain you can modify the signal using pulse width modulation effectively change the operating cycle and elevator speed engine. The method used in this article is reliable and Variable speed is easy to implement which was noticed in this paper.[2]

The Sphinx4, a Java-based speech recognition library, is employed for accurate speech recognition. The recognition platform includes high-level interfaces like Live Speech Recognizer, Stream Speech Recognizer, Speech Aligner, and Speech Result. In the Live Speech Recognizer, the microphone serves as the speech source, utilizing start and end

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 10, Issue 12, December 2023

DOI: 10.17148/IARJSET.2023.101208

recording features for identification. On the other hand, Stream Speech Recognizer utilizes an Input Stream as the speech source, capable of receiving data from a file or network socket. Speech aligner aligns text and audio voice, while Speech Result offers links to various aspects of the recognition result, such as the recognized utterance, a list of terms with time stamps, and the recognition lattice. [3]

The architecture incorporates Sinusoidal Pulse Width Modulation (SPWM) technology and utilizes a photoelectric encoder to acquire speed data. It compares the provided speed curve with closed-loop power, continuously adjusting the elevator's speed in real-time. The typical trajectory of the elevator involves three stages: initiation, consistent running, and deceleration. The repeated starting and stopping actions of the elevatorpose a potential challenge to the motor's speed control. Ensuring a fast, secure, and comfortable elevator requires precise control of its speed, with an integrator predominantly regulating the speed of an older elevator, and timing governing the starting and deceleration processes.[4]

Voice recognition systems have been available in the market for a considerable duration, yet their full potential remains unrealized. This paper explores the optimal and reliable utilization of these systems.
Voice-controlled systems, particularly beneficial for individuals with disabilities, employ a speaker-dependent projection-based recognition algorithm to achieve commendable accuracy in recognizing voice commands. Enhancements can be achieved by expanding the reference pool and selecting acoustically diverse voice commands, transforming the recognition algorithm into a "multi-speaker independent" one.
The universal model of a voice-controlled elevator presented in this paper allows the realization of real working lift scenarios using contemporary technology.
Demonstrated in this paper is a voice recognition program and its integration with the controller, providing an ample array of commands essential for effective lift control.[5]

The voice-controlled elevator is very useful. This project tries to shed 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 that can be needed to make sure that the services provided by it make the system independent. It will make it easier for users to use the elevator service and will be of great benefit to physically-impaired people, reducing their reliance on others to use 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.[6]

This article explores the current strides in technology contributing to the advancement of "smarter" elevator systems. An emerging trend gaining prominence is the development of energy-generating elevators, a result of recent technological breakthroughs. The success of a shared environment within a vertical city hinges on meticulous planning of the vertical transportation system. The planning team needs a comprehensive understanding of the varied demands posed bya mixed-use skyscraper with diverse purposes. Thoughtful planning can enhance transparency in logistical operations for the general public, tenants, and residents. The most optimal logistical operations are those that aresmooth and inconspicuous. Utilizing "smart" designs to delve into cutting-edge elevator technologies has the potential to foster more environmentally friendly skyscraper architecture. Early collaboration among elevator manufacturers, builders, architects, urban designers, interior designers, and computer scientists may lead to effective solutions that result in cost savings, improved performance, and increased efficiencies.[7]

provide an overview of the elevator control system's structure, design, and simulation using PLC simulation software. The primary objective is to replace traditional relay logic elevator control systems with modern PLC- based counterparts. The implementation involves the utilization of ladder diagram logic for sensor interfacing. The paper details the application of an AC motor to drive the elevator cabin, automated through PLC, along withthe presentation of circuit diagrams and the development of ladder logic. The authors conclude that PLC-based control systems for elevators outperform other control systems. Additionally, the paper includes explanations of the flow chart of operation, as well as the development of hardware and software for interfacing PLC with elevators.[8]

The authors explore the extension of a proposed system for the synchronization of multiple elevators operating simultaneously. The paper emphasizes the efficiency of servinga larger number of people in a shorter time, allowing individuals to utilize their valuable time for more important matters instead of waiting for elevators. The system employs wireless sensors to detect and transmit information about the number of people requesting elevator transport. The smart elevator then analyzes this information to determine one or more optimal transport paths, providing a beneficial solution for individuals awaiting elevator services.[10]

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 10, Issue 12, December 2023

DOI: 10.17148/IARJSET.2023.101208

In the present day, elevators have become a crucial aspect of our daily lives. Nevertheless, there are inherent risks associated with elevator usage, stemming from system malfunctions or the absence of safety parameters, which can lead to severe injuries or, in some cases, loss of life. The implementation of a "Smart Protective System for Elevators" holds the potential to mitigate accidents. Utilizing sensors, this system identifies faults, thereby reducing the likelihood of accidents. IP cameras continuously monitor potential threats, and the collected data is displayed for assessment. Particularly in smaller apartments or complexes lacking generators or DG sets, a power outage can result in elevators being stuck between floors. In such scenarios, this system serves as an alternative or supplementary solution, facilitating safe floor-to-floor navigation. Amid the on-going global pandemic, where minimizing physical touch at public places is imperative, the android app 'Blynk' proves effective. It allows individuals to summon the elevator without physically touching the buttons. Numerous additional safety features and tools have been integrated into this system to enhance elevator safety. In conclusion, the adoption of this system significantly reduces the risks associated with elevators compared to the current scenario, instilling a sense of safety for individuals using elevators.[10]

While speech recognition systems have been accessible for application purposes for quite some time, their comprehensive utilization remains unrealized. The prospect of a Speech Controlled Elevator System emerges as a substantial alternative to traditional elevator systems, providing enhanced effectiveness andserviceability for individuals with disabilities on a broader scale. The suggested prototype model of the elevator stands as a foundation for comprehending advancements in voice signal recognition, mechanization, and control, exploring potential applications in related fields.[11]

II. GAP ANALYSIS

[1]. In this paper, the microphone is located externally and needs smart phone for implementation. Anyone can speak exceptional words using microphone.
[2]. In this system the code is not modular, so changes cannot be made in it and its difficult to add new features as this system mainly relies on the use of C++ programing language. As embedded C is more convenient to upload the code into the microcontroller.
[3]. This system needs to be further developed in terms of efficiency of elevator algorithm. This system uses java as its coding language which is difficult and they are also using different voice recognition devices which are very expensive.
[4]. In this proposed system of a smart elevator it relies onvoice recognition technology may not function on if the technology fails or not available. In this system we have to continuously adjust the speed of the elevator as it leads to loss of time.

VI. PROPOSED SYSTEM

To overcome the gap analysis we are making use of a system which will control the elevator through voice commands and provide hands free communication.
This system automatically informs the user which floor they are heading to without the touching the manual override buttons.
This system aims to use both hardware and software in a modular way to inculcate in the future.
The proposed system is considered to be more powerful as it runs on ESP32 microcontroller.
This system fails to take multiple voice inputs simultaneously as it depends on only on the microcontroller which voice can it recognize first.

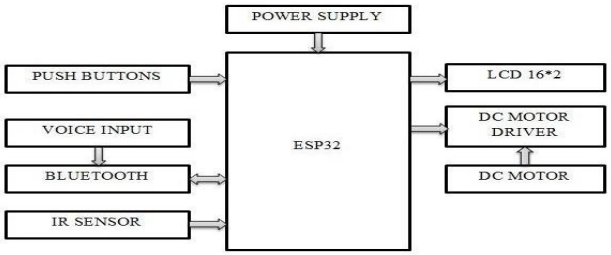

Figure 1. Block Diagram

V. APPLICATIONS

• Users can operate the elevator entirely through voice commands, eliminating the need to press buttons or touch surfaces. This is particularly useful in situations where hands-free operation is essential, such as during a pandemic or for

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 10, Issue 12, December 2023

DOI: 10.17148/IARJSET.2023.101208

individuals with mobility challenges.

• Voice-activated controls make elevators more accessible for individuals with disabilities. The system can recognize and respond to a diverse range of voices, accommodating users with different accents, languages, or speech patterns.

• The system can gather user feedback through voice interactions, helping building managers understand user preferences and continuously improve the elevator experience. Analytics derived from voice commands can also be used for performance optimization.

VI. CONCLUSION

The voice-controlled elevator is very useful. This project tries to shed 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 that can be needed to make sure that the services provided by it make the system independent. It will make it easier for users to use the elevator service and will be of great benefit to physically-impaired people, reducing their reliance on others to use 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.

REFERENCES

[1] Vipul Punjabi, Ibrahim Khatik, Rajhansa Wagh, Archana Mahajan, Divya Patil, Ashwini Pawar. “VoiceOperated Lift/Elevator in Emergency”, November, 2018

[2] B. K. Srilatha1, B. Reeshma2, “Automated elevator-an attentive elevator to elevate using speechrecognition”, February, 2020.

[3] "D. Meenatchi, R. Aishwarya, `A Voice Recognizing Elevator System”, December, 2016. [4]. D. Haojun Qin “Elevator Drive Control system based on single Chip Microcomputer”

[5]. Malim Huzaifa Salim, Sami Jaitapkar, Faki Ziyaan, Kazi Ibrahim “Voice based lift control”- IJRASET.

[6]. “Smart Elevator” Ms. Kavita Jadhav1, Mr. Piyush Dhamne2, Ms. Prachi Matsagar3, Ms. SujataSuryavanshi – 2022

[7]. Smart Elevator System Kheir Al - Kodmany – 2023

[8]. "International Journal of Advance Research in Electrical, Electronics, and Instrumentation Engineering," theauthors, Omkar M. Shete, Divyani V. Shete, and Saurabh G. Pise,

[9]. ISO 3297:2007 titled "International Journal of Advanced Research in Computer and CommunicationEngineering," presented by the Shri Madhwa Vadiraja Institute of Technology and Management in Udupi, India

[10]. “ Smart Protective System for elevators” International Journal of Engineering Applied Sciencesand Technology, 2021 Vol. 6, Issue 1, ISSN No. 2455-2143, Pages 206-213 Rajendra B. Sadafale

[11].” Speech Controlled Wireless Elevator System”- 1S.S.Patil, 2Bhavesh Patkar, 3Arunkumar Padyachi,4Tushar Patil 2020.

