**CHAPTER 1**

**1. INTODUCTION**

The history of elevators is long and fascinating. The first known elevator was invented by Archimedes in 236 BC. It was a simple hoist powered by human or animal labor. In 1852, Elisha Otis demonstrated the first safety-based elevator. This elevator had a brake that would engage if the cable broke, preventing the elevator from falling. Otis's invention revolutionized the elevator industry and made elevators safe for public use. In 1857, Otis installed the first passenger elevator in a New York City store. This elevator was powered by steam. In 1874, J.W. Meeker patented a method that allowed elevator doors to open and close safely. This invention made elevators more user-friendly and increased their efficiency. The first residential elevator was created by Clearance Conrad in 1929. This elevator was powered by electricity. In the 1950s, Otis introduced the Autotropic system, which was the first predictive elevator control system. This system could anticipate traffic patterns within a building and deploy elevators in the most efficient manner [1].

Blind people face many problems every day. One of these challenges is the use of elevators in many buildings. visually impaired should be able to enjoy using the elevator easily. Chapter To overcome this challenge for the blind, we must focus on the following issues: Make sure the blind person is at the elevator door Chapter Accept the idea of getting down for the blind person Chapter Attention coming into the elevator from the seat of the blind person [2].

Speech is the superior personality of the human beings gifted by the nature. Speech helps to deliver the thoughts and messages between human. Speech recognition is the process of the computer recognizing human speech to generate a string of words or commands. Sometimes it is known as automatic speech recognition. Speech recognition is becoming more perplexing and difficult task. The speech recognition research is focuses mainly on large vocabulary, continuous speech capabilities and speaker independence. The design of speech recognition requires cautious attention to some issues like speech representation, depiction of various types of speech Classes, techniques, and database and performance evaluation [3].

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, directions, elevator car’s door operation, and a special option to place a call of speaker’s choice in case of any unexpected event that requires immediate action[4]

This system is a modern elevator system equipped with voice recognition technology, allowing passengers to control the elevator using spoken commands. Additionally, it includes an emergency indicator system to ensure passenger safety during critical situations. This innovative lift not only enhances convenience but also prioritizes safety in vertical transportation.[11]

Elevator has over the time become an important part of our day-to-day life. It is used as an everyday transport device useful to move goods as well as persons. In the modern world, cities and crowded areas require multi-floor buildings. The main purpose of this project is to operate the elevator by voice command. Therefore, we have decided to come up with a new idea, which is fascinating as well as helpful. We have tried to develop an elevator system that accepts the destination input via a voice recognition module and taking the elevator to the destination accordingly. Speech recognition is the method by which the elevator can be controlled using voice.[12]

The elevator is extremely common for most places days. The employment of elevators is increasing in numerous applications like those square measure used in carrying product and carrying folks vertically in tall buildings like offices, searching malls, and alternative skyscrapers. With increasing technological advancement, the need of these devices is increasing day by day. Therefore, this project focuses on designing and upgrading the existing elevator infrastructure with the voice commands.[13]

The basic working principle of elevator is based on the elevator algorithm, where an elevator can decide to stop based on two conditions. The first one being the direction and second one based on the current floor and destination floor. The elevator is generally made up of rotors, cables, pulleys based on traction, climbing or hydraulic model. To serve laboratory purposes it can also be designed by connecting the elevator system to a desktop to accept input voice.[14]

A Voice Control Elevator using a microcontroller is a cutting-edge elevator management solution. It employs a microcontroller to process voice commands from passengers, enabling them to control the elevator without pressing buttons. This technology streamlines the user experience, making it more intuitive and accessible while incorporating advanced automation for efficient vertical transportation.[15]

The Voice Control Elevator for Prevention of Physical Touch is a forward-thinking elevator system designed to minimize the need for physical contact with elevator buttons and controls. By utilizing voice recognition technology, passengers can simply speak their desired floor or command, eliminating the necessity to press buttons, which can potentially transmit germs and viruses. This innovative solution prioritizes hygiene and safety in vertical transportation, especially in situations where maintaining a clean environment is crucial.[16]

**CHAPTER 2**

**2. LITERATURE SURVEY**

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| **SR.NO.** | **Title Of Research Paper** | **Author Name** | **Published Year** | **Proposed System** |
| 1. | Elevator Control Using Speech Recognition for People with Physical Disabilities[4] | Komal Mahajan, Riddhi Nahar, Dhanali Khairnar, Shrutika Kinge, Sujata Suryawanshi | 2021 | The research combines speech recognition technology with machine learning to make the elevator control equipment that can be controlled by voice. This system uses python-based machine learning libraries with Raspberry pi 3B+. The word can be trained for more than hundreds of words. |
| 2. | Voice Operated Intelligent Lift[5] | Rashmi P C, Amulya, A Karthik Shetty, Akshata, Dilip Kumar U K | 2019 | In this system the lift operates based on the input voice commands. In this project MATLAB coding is used for voice recognition and IR sensor is used for detecting the floors and stopping the motor rotation. The DC motor is used for controlling the lift. The microcontroller is programmed using Embedded C. |
| 3. | Voice Based Lift Control[7] | Malim Huzaifa Salim, Sami Jaitapkar, Faki Ziyaan, Kazi Ibrahim | 2022 | This system accepts input by microphone, and taking the elevator to the destination accordingly. It uses raspberry pi and a speech API to communicate with cloud for the voice recognition. |
| **Sr.no.** | **Title Of Research Paper** | **Author Name** | **Published Year** | **Proposed System** |
| 4. | Implementation of Voice based Touchless Lift System[10] | B. Swathi, Akshay S Prathap, Aiswarya V Kumar, Ranjitha R, Raviteja Kaki | 2021 | This system uses Arduino Mega and Elechouse V3 Voice Recognition Module to correctly detect the command given by user, and uses servo motor to lift up and down the elevator, and a servo motor to open and close the doors of the elevator. For all this motors, it uses a relay driver circuit for driving the motors. |
| 5. | Voice operated Intelligent Lift with Emergency Indicator[11] | Anu K.G, Anupriya K.S, Arathy Suresan, Arjun Biju,  Lekshmi M.S. | 2017 | This project presents the design and construction of voice operated lift with emergency indicator. This device acts as a human machine communication system. The main purpose of designing this system is to operate the Elevator by using voice commands by the user. |
| 6. | Voice Controlled Elevator[12] | S Rahul,  Rajath S Bhushan,  Mrs. Pooja S. | 2021 | 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 control mechanism is delivered by the speech recognition system. Arduino is the competent to communicate with all input and output device simultaneously. |
| **SR.NO** | **Title Of Research Paper** | **Author Name** | **Published Year** | **Proposed System** |
| 7. | Controlling of Electric Elevator by using Voice Announcement, Speed Control and Mini Lift Model system[13] | Omkar Jadhav,  Shubhanshu Bishwash,  Manisha Ganguly,  Omkar Nayak. | 2021 | The aim of this project is to develop an elevator model that works smoothly on voice input like an actual elevator model would. For this purpose, it is expected to have a powerful processing system. The idea of this project is to develop an elevator system that accepts the destination input via external microphone and taking the elevator to the destination accordingly. |
| 8. | A Voice Recognition Elevator System[14] | Meenatchi. D,  Aishwarya. R,  Shahina. A | 2016 | 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. The proposed approach for an eight-floor elevator system uses a speaker independent automatic speech recognition system to recognize spoken words which includes the floor numbers, directions, and door commands. |
| 9. | Voice operated lift control system using microcontroller.[15] | Pawar P.A.,  Pawar M.S.,  Prof. Jadhav P.M. | 2018 | This paper deals with programming and through it we can display the floors through the 7-segment display which the elevator is moving and stop. The voice command is generated at each stage of elevator. The IR sensor is used for the purpose of identify the lift location. |
| **SR.NO** | **Title Of Research Paper** | **Author Name** | **Published Year** | **Proposed System** |
| 10. | Voice Control Elevator for Prevention of Physical Touch[16] | Archana L. Rane,  Nikhil Patil, | 2020 | The main aim of elevator is to transport the things like person or goods in fraction of seconds. As it has number of advantages so we prefer to use elevator. This system helps to avoid a physical touch to the device and prevent a spread a virus like corona with the help of giving voice command to the system and accordingly system is worked. This is a long-term solution which operates independently. |

1. Dilip Mathuria, Aditya Gaur, Ashish Gupta, “FPGA Implementation of Biometric based Elevator Controller”, IJETSR Volume 5, Issue 3, March 2018
2. Farouk Salah Mohamed Saod, Dr Maher Abdel Aziz, “Elevator for blind people using voice recognition” International Journal of Scientific & Engineering Research vol 9 Issue 7,July 18
3. Kaladharan N, Assistant Professor ,Dept. of Electrical Engineering. Annamalai University, IJIRCCE, “A study of speech recognition” volume.3,issue 9,page 8030- 8034,September 2015.
4. Komal Mahajan, Riddhi Nahar, Dhanali Khairnar, Shrutika Kinge, Sujata Suryawanshi, “Elevator Control Using Speech Recognition for People with Physical Disabilities” IJARIIE Vol-7 Issue-3 2021
5. Rashmi P C, Amulya, A Karthik Shetty, “Voice Operated Intelligent Lift” JETIR February 2019, Volume 6, Issue 2
6. Thomas Mohan, Amrutha K, Anjana Anil Kumar, Helen Johson, Silsha K, “Voice Operated Intelligent Lift”, IRJET VOL. 05 Issue.06 June 2018.
7. Malim Huzaifa Salim, Sami Jaitapkar, Faki Ziyaan, Kazi Ibrahim, “Voice Based Lift Control” IJRASET Volume 10 Issue V May 2022
8. P.Cernys, V.Kubilius, V.Macerauskas, K.Ratkevicius, “Intelligent Control of the Lift Model” IEEE international Workshop on Intelligent Data Acquisition and Advanced Computing System: Technology and Applications 8-10 September 2003
9. Aishwarya Pokharkar, Niriksha Poojari, Harish Pawar , Amey Patil, “Voice Operated Elevator” IJISRT Volume 6, Issue 5, May – 2021
10. B. Swathi, Akshay S Prathap, Aiswarya V Kumar, Ranjitha R, Raviteja Kaki, “Implementation of Voice based Touchless Lift System” IJSRCSEIT Volume 7, Issue 4, July-August-2021
11. Anu K G, Anupriya K S, Lekshmi M S, Arathy Suresan, Arjun Biju, “Voice Operated Intelligent Lift With Emergency Indicator”, IJARTET Vol. 4, Special Issue 15, March 2017
12. S Rahul, Rajath S Bhushan, Mrs. Pooja S, “VOICE CONTROLLED ELEVATOR”, IJRPR, Vol 2, Issue 7, 2021
13. Omkar Jadhav, Shubhanshu Bishwash, Manisha Ganguly, Omkar Nayak, “Controlling of Electric Elevator by using Voice Announcement, Speed Control and Mini Lift Model System”, IRJET Volume 8, Issue 4, Apr 2021
14. Meenatchi.D, Aishwarya.R, Shahina.A, “A Voice Recognizing Elevator System”, ResearchGate, Chapter December 2016
15. Pawar P.A, Pawar M.S, Prof. Jadhav P M, “Voice operated lift control system using microcontroller”, IRJET Volume 5, Issue 4, Apr-2018
16. Archana L. Rane, Nikhil Patil, “Voice Control Elevator for Prevention of Physical Touch”, IJCEAE Volume 1, Issue 4, Dec 2020
17. Datasheet of Atmega 2560 microcontroller