

# **VOICE RECOGNITION AI WHEEL CHAIR**

## **A PROJECT REPORT**

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# Abstract

## Voice Recognition Wheel Chair:

A voice-assisted wheelchair is a technologically advanced wheelchair that can be controlled using voice commands. It offers enhanced mobility and independence to wheelchair users. Voice recognition technology enables hands-free operation. It is a prototype which is constructed by voice recognition V3 module and L298N motor driver. The future developments such as Collision detection sensors to prevent accidents, Emergency stop functionality for immediate halting of the wheelchair, Integrated alarms and alerts for potential hazards, Backup power systems for uninterrupted operation and also AI and ML can enhance voice recognition technology. Improved user interfaces and integration with smart home devices can provide additional functionalities.



# 1.INTRODUCTION

The Voice Control AI Wheelchair (VCAIW) project aims to revolutionize mobility assistance for individuals with physical disabilities by integrating advanced voice recognition and artificial intelligence technologies into a motorized wheelchair platform. This report outlines the progress, development process, features, challenges, and future prospects of the VCAIW project.

## 2.PROJECT GOALS

- Develop a wheelchair interface that can be controlled entirely through voice commands.
- Implement intelligent navigation and obstacle avoidance capabilities to ensure safe and efficient movement.
- Enhance user experience and autonomy by providing personalized settings and customization options.
- Ensure reliability, accessibility, and user-friendliness of the VCAIW system.

## 3.DEVELOPMENT PROCESS

**Research:** Conducted extensive research on existing assistive technologies, user requirements, and technological advancements in AI and robotics. **(IN PROCESS)**

**Design:** Collaborated with experts in engineering, design, and accessibility to conceptualize the VCAIW system's architecture, user interface, and features. **(IN PROCESS )**

**Prototyping:** Developed iterative prototypes to test and refine core functionalities, including voice recognition, navigation, and safety mechanisms.

**Integration:** Integrated hardware components (sensors, actuators, microcontrollers) with software algorithms (voice recognition, AI navigation) to create a functional prototype.

## 4.FEATURES

**Voice Control:** Users can navigate the wheelchair, adjust speed, and activate various functions using natural language voice commands.

**Intelligent Navigation:** The wheelchair utilizes AI algorithms and sensor data to autonomously navigate through indoor and outdoor environments while avoiding obstacles.

**Personalization:** Users can customize settings such as speed, sensitivity, and voice commands to suit their preferences and needs.

**Safety Mechanisms:** The VCAIW includes built-in safety features such as collision avoidance, emergency stop, and fall detection to ensure user safety.

**Connectivity:** Integration with mobile devices allows users to remotely control the wheelchair, receive notifications, and access additional features.

## 5.CHALLENGES

**Technical Complexity:** Integrating diverse hardware and software components into a cohesive system posed technical challenges related to compatibility, reliability, and performance optimization.

**User Accessibility:** Ensuring the VCAIW is accessible and intuitive for users with varying abilities and preferences required iterative design improvements and user feedback sessions.

**Ethical Considerations:** Addressing privacy, security, and ethical implications of AI-powered assistive technologies necessitated careful consideration and compliance with regulations.

## 6.FUTURE PROSPECTS

**Advanced AI Capabilities:** Continued research and development efforts could enhance the VCAIW's AI capabilities, enabling it to learn from user interactions and provide more personalized assistance.

**Expanded Functionality:** Integration with smart home systems, environmental controls, and communication aids could further enhance the VCAIW's utility and accessibility.

**Accessibility Improvements:** Collaboration with accessibility experts and user communities can lead to further enhancements in usability, inclusivity, and user satisfaction.

## CONCLUSION

The Voice Control AI Wheelchair represents a significant advancement in assistive technology innovation, offering individuals with physical disabilities greater independence, mobility, and quality of life. Through ongoing collaboration, research, and development, the VCAIW project aims to continue improving accessibility, usability, and functionality to meet the diverse needs of its users.

## REFERENCE

[https://drive.google.com/drive/folders/1cR3ePirasExxzAeRNgCcCPSgoI6fNXBc?usp=drive\\_link](https://drive.google.com/drive/folders/1cR3ePirasExxzAeRNgCcCPSgoI6fNXBc?usp=drive_link)









