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Smart Wheelchair

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Abstract: This project report presents the design and development of a smart wheelchair system powered by Arduino, integrating voice command control and obstacle detection to enhance mobility, independence and safety for individuals and physical disabilities. Traditional wheelchairs often require manual effort or complex control mechanisms, limiting usability for users with severe impairments. The proposed system leverages voice recognition technology to allow hands-free navigation, enabling users to control the wheelchair using simple spoken commands.

An ultrasonic sensor -based obstacle detection module ensures real time environmental awareness automatically halting movements to prevent collisions and accidents. The Arduino microcontroller serves as the processing unit, coordinating input from the voice recognition module and sensors to execute precise movement commands. The report outlines the systems hardware and software architecture, including motor control, sensor interfacing, voice command processing, It also discusses the advantages ,challenges ,and future improvement possibilities of the system. This smart wheelchair offers a low cost ,customizable ,and user friendly mobility solution with significant potential for application in assistive healthcare technologies.

Keywords: Smart Wheelchair, Arduino, Voice Command , Obstacle Detection, Ultrasonic Sensor, Assistive Technology, Mobility Aid



