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(71)**Name of Applicant :**
1)Dr. M. Jagadeesh Chandra Prasad
Address of Applicant :Professor, Hod of ECE Dept., ECE Department, Malla Reddy Engineering College (Autonomous) Dulapally Road, Maisammaguda (Post) via. Kompally, Secunderabad, Hyderabad, Rangareddy District, Telangana – 500100, India Maisammaguda ---------- ----------
2)Malla Reddy Engineering College
Name of Applicant : NA
Address of Applicant : NA
(72)**Name of Inventor :**
1)Dr. M. Jagadeesh Chandra Prasad
Address of Applicant :Professor, Hod of ECE Dept., ECE Department, Malla Reddy Engineering College (Autonomous) Dulapally Road, Maisammaguda (Post) via. Kompally, Secunderabad, Hyderabad, Rangareddy District, Telangana – 500100, India Maisammaguda ---------- ----------
2)Chowderpally Akhilesh
Address of Applicant :Student, Electronics and Communication Engineering Dept., Malla Reddy Engineering College, Maisammaguda (Post. Via. Kompally), Mechal-Malkajgiri-500100. Maisammaguda ---------- ----------
3)Sri Vaishnavi
Address of Applicant :Student, Electronics and communication Engineering Dept., Malla Reddy Engineering College, Maisammaguda (Post. Via. Kompally), Mechal-Malkajgiri-500100. Maisammaguda ---------- ----------
4)Bollam Teja
Address of Applicant :Student, Electronics and communication Engineering Dept., Malla Reddy Engineering College, Maisammaguda (Post. Via. Kompally), Mechal-Malkajgiri-500100 Maisammaguda ---------- ----------
5)S. Vasudha
Address of Applicant :Student, Electronics and communication engineering dept, mallareddy engineering college, Maisammaguda (post, Via, kompally) Mechal-malkajgiri-500100 Maisammaguda ---------- ----------
6)Dr.S.Sima Sahu
Address of Applicant :Associate Professor, ECE Department, Malla Reddy Engineering College (Autonomous) Dulapally Road, Maisammaguda (Post) via. Kompally, Secunderabad, Hyderabad, Rangareddy District, Telangana – 500100, India Maisammaguda ---------- ----------
7)Mrs. K.Uma Rani
Address of Applicant :Assistant Professor, ECE Department, Malla Reddy Engineering College (Autonomous) Dulapally Road, Maisammaguda (Post) via. Kompally, Secunderabad, Hyderabad, Rangareddy District, Telangana – 500100, India Maisammaguda ---------- ----------
8)Mrs.C.Harini
Address of Applicant :Assistant Professor, ECE Department, Malla Reddy Engineering College (Autonomous) Dulapally Road, Maisammaguda (Post) via. Kompally, Secunderabad, Hyderabad, Rangareddy District, Telangana – 500100, India Maisammaguda ---------- ----------
9)Mrs.L.Sailaja
Address of Applicant :Assistant Professor, ECE Department, Malla Reddy Engineering College (Autonomous) Dulapally Road, Maisammaguda (Post) via. Kompally, Secunderabad, Hyderabad, Rangareddy District, Telangana – 500100, India Maisammaguda ---------- ----------

(57) Abstract :
This invention presents the design, development, and evaluation of a prototype for an automated voice-controlled wheelchair using Arduino and a Bluetooth module. The objective of this work is to create a cost-effective and accessible solution for individuals with limited physical mobility, allowing them to navigate their surroundings using voice commands. The prototype utilizes an Arduino microcontroller as the central control unit, which communicates wirelessly with a Bluetooth module. The Bluetooth module enables seamless integration between the wheelchair and a user's smartphone or tablet, acting as a voice input device. In this prototype, an Arduino Board, Bluetooth module, Geared DC motors,12V 6Ah Lead acid Battery and the H-Bridge circuit made using Relay modules are used. The Arduino microcontroller processes the voice commands received via Bluetooth and translates them into appropriate control signals for the wheelchair's motors. The control signals are sent to motor driver circuits, enabling precise movement and navigation based on the user's instructions. The results of the evaluation demonstrated the feasibility and effectiveness of the voice-controlled wheelchair prototype. The system exhibited high accuracy in recognizing voice commands, allowing users to navigate their environment with minimal effort. The response time was measured to be within acceptable limits, ensuring real-time control and providing a smooth and responsive user experience. Future work involves exploring the integration of integrated medical devices into the voice-controlled wheelchair prototype. This integration aims to enhance the functionality and safety features of the wheelchair, providing added support for individuals with specific medical needs. Integration with medical devices such as heart rate monitors, blood pressure monitors, or oxygen level sensors can enable real-time health monitoring for wheelchair users. This data can be transmitted wirelessly to the user's mobile device or a centralized monitoring system, allowing caregivers or healthcare professionals to remotely track the user's vital signs and provide timely assistance if needed.

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