Developing a Power-Assisted Voice-Controlled Manual Wheelchair

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Wheelchairs are an essential need for individuals with disability. Low-cost manual wheelchairs The finalist wanted to test a uniquely designed voice-controlled wheelchair system which enhanced an ordinary powered wheelchair, and used sensors to perceive the wheelchair's surroundings and a speech interface to interpret commands. This wheelchair awarded the capability of mobility to the user, which gave the user a sense of independence and could improve their lifestyle. METHOD Components was tested individually before being connected. All electric components were connected to the breadboard and interfaced with each other. Coding for the system changed with every trial as it required different connections and different instructions. For the first prototype to test, a motor driver was used. For the second prototype, a MOSFET was used. The third prototype made use of a relay system. The latest, most suitable prototype which was the system with the motor driver, the Microcontroller, breadboard and all its connection were placed neatly into a box and then screwed securely onto the plate on the wheelchair. DATA/RESULTS In prototype 1, the motors ran in the desired directions and was reasonably quick with no load or pressure being applied. In prototype 2, the MOSFET didn’t work at its full capability as the motors were unable to reverse. In prototype 3, when the system was powered on and given an instruction, the motors did not operate. CONCLUSION Prototype 1 was selected as the best and most viable solution. The prototype worked as desired as it moved in the direction spoken by the user. It also was able to detect nearby objects in its surrounding and stopped automatically. Thus, achieved its purpose to award the capability of mobility.

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