

Fabrication of a Locally Designed Solar-Powered Wheelchair

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(Received April 17, 2020; Revised May 17, 2020; Accepted June 02, 2020)

Abstract

Powered assistive technology has greatly restored ambulation of patients or persons with physical disability or impairments. Recharging the battery of the electrically powered wheelchairs can be challenging due to inadequacy of conventional energy sources in the developing nations. Due to WHO considerations, the work designed a solar powered wheelchair that is user- and environmentally-friendly. The main factors considered for the design were the weight, speed, cost, durability, width and height of the wheelchair. Two 24volt DC gear motors; two 12volt, 36AH batteries; and a solar panel of 18volt, 80 watt capacity were used among other electronic components to achieved the device. The microcontroller (atmega32) maximum consumable current is 200mA and it served as the processor. The inclusion of the ultrasonic obstruction monitoring sensor, solar panel roof and the recommended average speed of 1.79m/s made the vehicle safe for distant outdoor use. Its control commands included start/ stop, front, back, left, and right. The battery is recharged by the solar panel. The relatively low-cost solar powered wheelchair is proven to be an efficient mobility aid, improving life quality, and the dignity of the elderly and others with mobility difficulties arising from pathological disabilities and accident-related injuries.

Key words: *Fabrication, Locally-designed, Solar powered, Wheelchair, Disability*

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