

A Smart Electric Power Wheelchair Controlled by Head Motion

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Abstract : The aim of this paper was to design a smart electric power wheelchair (SEPW) with a novel control system for quadriplegics with head and neck mobility. Head movement has been used as a control interface for people with motor impairments in a range of applications. Acquiring measurements from the module is simplified through a synchronous a motor. Axis measures the two directions namely X,Y and Z. The model of a DC motor is considered as a speed control by selection of a PID parameters using genetic algorithm. An experimental set-up constructed, which consists of micro controller Arduino ATmega32u4 as controllers, a DC motor driven SEPW and feedback elements. And this paper is tuning methods of parameter for a pulse width modulation (PWM) control system. A speed controller has been designed successfully for closed loop of the DC motor so that the motor runs very closed to the reference speed and angle. SEPW controller can be used to ensure the person's head is attending the direction of travel asserted by a conventional, direction and speed control.

Keywords : wheelchair, quadriplegia, rehabilitation, medical devices, speed control

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