DESIGN OF AUTOMATIC WHEELCHAIR CONTROL USING BLUETOOTH BASED MICROCONTROLLER

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ABSTRACT

With the development of today's world of technology, daily human activities can be further assisted by robot technology so that daily human work or activities can be more efficient. A wheelchair is an assistive device used by someone who has difficulty walking on their feet, either due to illness or injury. To make it easier for users to operate a wheelchair to be more efficient and not consume a lot of energy, an electric wheelchair was created. This electric wheelchair uses a bluetooth-based microcontroller to control it, namely by installing a Flex Sensor on the user's neck whose neck movement direction is in accordance with the direction of movement of the electric wheelchair, without having to use hands to move it. The type of Bluetooth used is the Bluetooth Module HC-05, and the type of microcontroller used is Arduino Nano. In the results of the tilt angle test on the Flex Sensor, the results obtained, so that the prototype of the automatic wheelchair can respond to commands and move, the flex sensor must be at a minimum tilt angle of 20°. After testing the motion on the automatic wheelchair control design using a time of 3 seconds and a speed of 143.1 Rpm, the results obtained are the average distance for forward movement is 112.2 cm, backward movement is 112 cm, left movement is 108.6 cm, and right movement is 108.2. cm, then the maximum value of displacement distance error is 0.025% from all motion tests. The connection distance of the Bluetooth Module HC-05 on the control section with the prototype section of the automatic wheelchair, a maximum distance of 30 cm to stay connected to each other.

Keywords *: Wheelchair, Bluetooth HC-05, Arduino Nano, Fle Sensor*