

DEVELOPMENT OF THE ANDROID BASED MONITORING SYSTEM FOR TWO WHEELS ELECTRIC-BIKE WITH BRUSHLESS DC MOTOR

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ABSTRACT

Today, two wheels electric-bike are commonly not yet equipped with an electronic control system which is able to make more comfort and safety for the biker. For examples, the electric-bike can be turned-on or turned-off using android smartphone, and the battery voltage level can be displayed on the android smartphone's screen. This research is purposed to design and to develop an electronic control and monitoring systems for a DC motor that used to operate a two wheels electric-bike by integrating microcontroller, Bluetooth module and android smartphone.

The overall research passed through four phases: (1) needs analysis and identification, (2) the design of the system, (3) implementation and development, and (4) testing the developed-system. The needs analysis phase includes the analysis of the needs of the technical components both hardware and software. The core component of this control system is a microcontroller Atmega 328. The design phase includes the design of an electronic circuit systems that can integrate the functionalities of the Atmega 328, Bluetooth module and an android smartphones. In the implementation and development phase, writing the codes that can be run in Atmega 328 for controlling and monitoring the DC motor, than developing an android application using App Inventor 2.

The results of this research is an electronic system that able to integrate a microcontroller Atmega 328, Bluetooth devices and android smartphones for controlling and monitoring the DC motor of such two wheels electric-bike. The general performance of the data communication between android smartphone and the electronic control system based on Atmega 328 (via Bluetooth) will be effective and work properly within 0 to 15 meters. The android application can be installed in various brands of android smartphone and versions of the android operating system. In simple reusability testing, the vast majority of respondents (1) agree that these developed electronic control system facilitate and assist the user (biker) during operating the electric-bike; (2) state that the electronic control system is easy to understand and to operate, (3) getting excited, interested, wanted to have and would recommend it to others.

Kata Kunci: *electric-bike, Bluetooth, microcontroller, android*