

## **ABSTRACT**

Bicycles are vehicles that have been known since time immemorial. In ancient times, bicycles were the main means of transportation. And for now the bike is used only for exercising on the weekends or just traveling short distances. Due to daily vehicles, the position of bicycles has been replaced by motorized vehicles.

To design this electric bicycle using the main components, namely BLDC 350W, controller, lithium ion battery as a power supply, relay as an automatic switch to turn on the electric motor, Arduino Uno as a data processor and heart rate sensor as a trigger to turn on the bike which is connected to an automatic relay. by reading the user's heart rate. The speed controller component is using a controller.

Based on the results of the design of an electric bicycle equipped with a heart rate sensor, it can be concluded that the speed of this electric bicycle is very dependent on the battery voltage, the battery used is a battery with a maximum voltage of 42 volts with a current of 5 Ampere and a capacity of 13 Ah. When the heart rate sensor on the system touches a number  $>120$  BPM, the system on the electric bicycle will turn on and can be used, then testing is carried out when the body is doing heavy activities using a bicycle. And for testing the sensor function is done when the heart rate is not heavy activity  $> 120$  BPM.

Keywords: Electric bicycle, BLDC motor, arduino uno, Heart Rate Sensor, relay, Lithium Ion.