ABSTRACT

Many motorized vehicles have now been created, one of which is a motorcycle. However, many motorcycle owners modify their vehicle parts, for example in the exhaust which is converted into a racing type exhaust. The noise from the exhaust of this motorcycle can disturb the comfort and concentration of the community. This study aims to provide a clearer view of potential solutions to this problem, focusing on identifying the optimal distance to place sensors to measure racing exhaust noise levels. This study used a KY-038 type sound sensor to measure racing exhaust noise. This sensor is placed at certain distances, namely 100 cm, 150 cm, 200 cm, 250 cm, 300 cm, 350 cm, and 400 cm from the sound source. The noise data obtained by this sound sensor will be processed by the Arduino microcontroller board. The system is also equipped with a camera feature that uses the ESP32CAM module to take pictures of the vehicle when the exhaust noise level exceeds the 80 dB threshold. Data collection is carried out by measuring the noise level of the motor exhaust when the vehicle is stationary. The test results show that the optimal distance for motor exhaust noise measurement using the KY-038 sound sensor is 150 cm. With an accuracy rate of up to 97%, this system is able to provide accurate information about the noise level of motor vehicles. This research can be concluded that the design of the system made is able to measure the noise level of the motor exhaust precisely at varying distances.

Keywords: *Racing Exhaust, KY-038 Sensor, ESP32-CAM, Distance, Arduino*