ABSTRACT

The design of a data transmission system for monitoring cars has significant relevance in the development of modern automotive technology. Several key factors underlie this design, with driving safety as the main focus, emphasizing the importance of quick response to emergencies and detecting potential dangers as an essential element to improve safety. Cars are equipped with various sensors that produce data, such as caliper temperature, engine temperature, vehicle emissions, and transmission temperature. Integrating data from multiple sensors is a challenge and an excellent opportunity to improve car intelligence and performance. So, designing an intelligent data transmission system will have a crucial role in enhancing car safety, efficiency, and performance.

The solutions offered in designing a car safety data transmission system aim to reduce traffic accidents caused by errors or abnormal conditions in the car. This system is designed to detect potential dangers and provide a quick response to emergencies, thereby improving driving safety by integrating data from various sensors in the car. This system is also designed to be stable and reliable in multiple operational conditions, such as varying weather situations. With the integration of these sensors, the system can monitor data in real-time, providing accurate and timely information to users. This makes it easier to detect anomalies in the car and increases the ease and speed of monitoring the car's condition.

Testing of the developed system shows adequate performance in automatically and accurately detecting and monitoring the health of the car using the features of Blynk, which is very supportive in maintaining vehicle safety and efficiency. The test results recorded an average transmission temperature of 28℃ at idle and 70℃ when the vehicle was running, engine temperature of 54℃ at idle and 81℃ when running, and caliper temperature of 27℃ at idle and increased to 31℃ when running. In addition, the average vehicle emissions were measured at 946 ppm at idle and 1235 ppm when the vehicle was running. For further development, several aspects need to be considered, such as temperature management on the ESP32 microcontroller, sensor resistance to various terrain and temperature conditions, and improved device durability to ensure long-term operation without performance degradation. Future development can also include adding sensors for additional safety parameters as well as improving the software to make it more user-friendly. This research not only resulted in satisfactory testing, but also provided important recommendations for further development, to ensure these systems and devices continue to contribute effectively and efficiently to keeping vehicles safe and healthy.

Keyword: Health, Blynk, Microcontroller, Sensor, Monitoring