ABSTRACT

The condition of vehicle tires is a crucial factor in ensuring driving safety and vehicle maintenance efficiency. Excessive tire wear can increase the risk of accidents, fuel consumption, and operational costs. This research develops a Fuzzy Logic-based tire condition prediction system by utilizing data from the Tire Pressure Monitoring System (TPMS) and Light Detection and Ranging (LiDAR). TPMS is used to measure tire pressure and temperature, while LiDAR is used to measure tire thread thickness. The data obtained from both sensors is processed through a preprocessing stage, then analyzed using fuzzy logic to classify the tire condition into three categories: Good, Medium, and Poor. Test results show that the system can detect changes in tire condition adaptively and accurately. The system is expected to provide relevant information to users regarding the condition of vehicle tires, to support more informed decision-making in terms of maintenance and driving safety.

Keywords: Fuzzy Logic, Tire Condition Prediction, Classification System.