

ABSTRACT

The increase in infrastructure development in Indonesia has contributed to a higher risk of traffic accidents. According to data from Statistics Indonesia (BPS), a total of 1922 accidents occurred on toll roads in Jakarta and its surrounding areas between 2019 and 2021, with 86% caused by driver negligence. One common form of negligence is disobedience to traffic signs. To reduce the risk of accidents caused by human factors, the application of Computer Vision and Machine Learning technologies offers a potential solution, particularly for the automatic recognition of traffic signs. This study compares two image feature extraction methods, namely Histogram of Oriented Gradient (HOG) and Local Binary Pattern (LBP), combined with the Support Vector Machine (SVM) classification algorithm. The dataset used is sourced from the Semarang–Solo road. Evaluation results from 452 test data show that the HOG-SVM method achieved the highest accuracy of 98,45%, with a precision of 100%, recall of 96,92%, and F1-score of 98,43%. Meanwhile, the LBP-SVM method only reached a maximum accuracy of 84,95%, with a precision of 84,71%, recall of 85,46%, and F1-score of 85,08%. Based on these results, HOG proved to be more accurate in classifying traffic signs compared to LBP. However, since LBP has the advantage of lower computational complexity, the choice of feature extraction method should be adjusted according to system requirements, whether prioritizing accuracy or processing efficiency.

Keywords : Feature Extraction, HOG, LBP, Semarang, Solo, SVM, Traffic Signs