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Motorbike assistance tool using image processing technique

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Accidents involving motor vehicles account for a significant number of deaths and injuries that occur each year in Sri Lanka. The rider's failure to be aware of vehicles following him and his inability to accurately estimate whether or not they will pass are two factors that frequently lead to collisions involving motorcycles. Even though there are several different technologies that can detect vehicles and lanes, the vast majority of them are not built for motorcyclists and even those that have additional drawbacks. This study proposed to create and develop a motorbike assistance tool that makes use of image processing techniques for road line recognition and behind vehicle detection in order to lower the average number of accidents that involve motorbikes each day. The novelty of this motorbike assistant tool is its ability of behind vehicle detection with the middle line detection. The Python programming language and the Open-CV library were utilized during the creation of this auxiliary tool. This program used the Counter Operation algorithm, which includes the open-cv library, to detect the behind lines. The open-cv package was also a part of this detection process. The TensorFlow object detection module was utilized largely for the purpose of recognizing vehicles from the back. A mobile application was created with Flutter to display those data. Using an ESP 32 camera, the hardware for video capture was developed. The ESP 32 camera and the mobile application were connected for final output. In addition to displaying the names of vehicles that were following the motorcycle, it also displayed the distance between the motorcycle and the center line of the road. According to the results, ninety percent of the attempts to detect the road lines were successful. Nevertheless, the identification of vehicles left behind was successful in a total of seventy percent of the cases. Some improvements such as solving the problem of detecting vehicles that pass the motorbike while coming from the front side should be done to this assistance tool.

Keywords: Image processing technique; Motorbike assistance; Road line detection; Vehicle detection