

## **Image processing-based algorithm and system development for multi-vehicle speed estimation.**

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Inappropriate speeding continues to be a major contributing factor to road accidents which claim millions of lives every year. This has raised a demand for vehicle speed estimation as a means to assist in speed enforcement. Lidar technology among others has been widely used despite their several shortfalls including the cosine error, shading and interference. This study considered the use of image processing techniques to simultaneously estimate speed of multiple vehicles and overcome some of the major shortfalls in existing technologies. In this study, the algorithm for multi-vehicle speed estimation using image processing was developed and a system implemented using client-server architecture as an ICT solution for processing and storage. The developed system was tested to ensure its accuracy in multi-vehicle detection and speed estimation. During test, system capability to simultaneously detect and process speed of up to six (6) vehicles was observed. Speed estimation accuracy of 2.7% was obtained when compared to the actual vehicle speed measured by the speedometer. It was also seen that the error in vehicle speed estimation was inversely proportional to vehicle speed, that means higher error were observed at lower speeds.