

## Traffic Analysis and Prediction Using Closed-Circuit Television Systems

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**Abstract :** Road traffic congestion is continually deteriorating in Hong Kong. The largest contributing factor is the increase in vehicle fleet size, resulting in higher competition over the utilisation of road space. This study proposes a project that can process closed-circuit television images and videos to provide real-time traffic detection and prediction capabilities. Specifically, a deep-learning model involving computer vision techniques for video and image-based vehicle counting, then a separate model to detect and predict traffic congestion levels based on said data. State-of-the-art object detection models such as You Only Look Once and Faster Region-based Convolutional Neural Networks are tested and compared on closed-circuit television data from various major roads in Hong Kong. It is then used for training in long short-term memory networks to be able to predict traffic conditions in the near future, in an effort to provide more precise and quicker overviews of current and future traffic conditions relative to current solutions such as navigation apps.

**Keywords :** intelligent transportation system, vehicle detection, traffic analysis, deep learning, machine learning, computer vision, traffic prediction

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