

## Comprehensive Study on Intelligent Traffic Light System Using Image Processing and Machine Learning

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### Abstract

With increasing numbers of vehicles worldwide, urban traffic in Sri Lanka is also increasing. Due to this, traffic congestion and traffic accidents are on the rise. According to the statistics provided from the country's government, person's average waiting time at a traffic light is 70 seconds, which is approximately 10% of total driving time. This may seem to be a significant amount for those who are leading busy lives. In addition, high density of traffic causes traffic-related problems like lack of road safety and parking challenges. This research study was conducted to seek a viable technological solution for such problems. We gathered feedback experienced by roads users who encounter at least one traffic light daily. It was then identified that the problems arise due to inefficiency of the current traffic light system which (1) cannot adapt to real-time traffic flow and (2) the inability to make dynamic decisions based on the traffic flow. As a viable solution, this research studied on a system architecture of an intelligent traffic light system using image processing and machine learning that can be implemented in Sri Lanka.

**Keywords:** *Traffic light system, Image processing, Machine learning, Dynamic decision making, Adaptability*