

# HOG and Dimensional Feature based Vehicle Classification for Parking Slot Allocation

## Authors

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## Abstract:

The utilization of vehicles increases with the increased number of populations. Unplanned parking strategies causes additional traffic problems, waste of time, unwanted conflicts among drivers, damages etc. Vehicles need appropriate parking areas based on their size and dimension to be fit well. In Sri Lanka, a manual processing is adopted to handle most of the parking areas, which wastes energy, time and causes stress. In city areas, parking vehicles on the road-side is strictly restricted. In this paper, an automated system of vehicle classification for allocating parking slots in public premises is proposed. This system can capture a set of vehicle images, identify the type of vehicle, estimate the size of vehicle and allocate a good fit parking slot based on their dimensional and type parameters. Geometrical or dimensional attributes and Histogram of Oriented Gradient features are extracted, and Support Vector Machine is used for classification. Feature fusion is exploited to investigate the impact of fusion strategy on system performance. Principal Component Analysis is applied to reduce the dimension of the feature vector, which results further significant improvement in the system performance.

## Keywords

- Vehicle classification,
- Feature fusion,

- Histogram of oriented gradient (HOG),
- Support vector machine (SVM),
- Principal Component Analysis (PCA)

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