**Final Year Project**

Design Document

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# **Overview**

A web application that live streaming a video feed of a road and project onto the web application while tracking vehicles using machine learning object detection and do some data analysis.

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# **Context**

The purpose of this application is to show how a machine can learn from datasets and recognise vehicles that are passing by the road while gathering and analysing data.

# **Goals**

* Display live video feed of the road onto the web application
* Vehicle recognition with deep learning
* Pre-trained model for Convolutional Neural Network
* Gather information and plot onto web application page

# **Approach**

## Front end:

The front end is a React web application that is built with Python Flask framework. The main page of the web page will consist of a live video feed of a webcam streaming the events on the road outside my room window. The video feed will then display tracking of vehicles passing by or parking by the road. Other than the video feed, the web page can also show data collected by the application like how many cars passed by in one day in any kinds of format (graphs etc.).

## Back end:

The back end of the web application is where the machine learning took place. The application will be coded in Python. It will train a neural network model that recognise vehicles using pre-trained datasets using TensorFlow Keras library and also data analysis.

# **Problems**

* Video frames resolution may affect performance
* Webcam position/elevation may affect recognition
* Need to find a data set consist of vehicles to implement a supervised machine learning environment
* Limited knowledge on machine learning, extensive research is required.

# **Before Implementation**

Before the implementation of the application, try and find a pre-trained dataset suitable for the project. If not, the project may cease to progress and need to find another solution for the model.