Number Plate Detection and Recognition Project

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# Objective

To detect the vehicle number from vehicle number plate with high accuracy using image processing.

# Problem statement

As Indian vehicle number plate do not follow a standard way, it is very difficult to accurately detect the vehicle number plate from vehicle image. The existing algorithms provide vehicle number plate detection but they are not that accurate and time efficient. Therefore an algorithm is needed to solve this problem which should be more time efficient, reliable(~100% ideally) and consistent(~100% ideally) with support for wide variety of number plates of India, UK, US etc.

# Solution Considerations

A program consisting of deep learning and image processing based algorithms that takes following input, processes and gives desired output. This includes a detection and isolation algorithm, and a recognition algorithm. The detection algorithm detects and isolates the number plate from a regular image of a vehicle, which is used by a deep learning algorithm as uniform inputs to recognise the characters in the number plate.

The algorithm must be able to correctly and time efficiently detect vehicle numbers from image that includes one vehicle. This should be done for various formats for the vehicle number plates that are being used world wide including India, UK, US, etc.

# Input

Vehicle number plate images and country to which that vehicle belongs.

# Output

Vehicle number of that Vehicle.

# Test Data

Consider at least 500+ images for test data with all possible day and night time snaps and different climate conditions like rains, fog, dusty, etc.

# Scenarios

1. Focus - In focus, not in focus(blurred but readable)
2. Distance - close up, medium far (10 ft),
3. Height/Angle - Level, from above
4. Lighting/Weather - Bright/day, dark/night, rainy, dusty, foggy, shadow, dirt, background lighting on number plate
5. Quality - Color, Greyscale, Camera quality
6. Number - One number plate in frame, More than one number plate

# Deliverables

1. A practical Number plate detection and isolation program that works for above scenarios.
2. A Number plate character recognition program for the above isolated number plate.
3. Testing accuracy results for the collected data sample.
4. Modifying heuristics of applied algorithms to increase accuracy and efficiency.

# Constraints

1. Lack of data for some of the scenarios, like foggy and rainy conditions.
2. Possible accuracy drop due to unorthodox number plates.

# Deadlines

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| Deadline date | Target | Status |
| 28-1-2019 | Test data collection | Completed |
| 4-2-2019 | Project Scope statement | Completed |
| 11-2-2019 | Selection of suitable algorithms for different scenarios from the existing pool. |  |
| 25-2-2019 | Test and modification of the algorithms for better accuracy. |  |
| 2-3-2019 | Final Deliverables. |  |