IP'18 Apps Specs

Traffic Lights Detection and Recognition

# Description

## Main Idea

In [autonomous car driving system](https://www.youtube.com/watch?v=xZ1DrmFOeZQ), one of the tasks is to detect and recognize traffic lights. Traffic lights come in standard shape with one of the three colors is lightened at a time.

Given a captured image from street. The application should detect if there is any traffic lights and recognize its state (red, green, and blue)

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| --- | --- |
| **Input** | A red traffic light sitting next to a tree  Description generated with very high confidence |
| **Output** | Light : Green |

## Minimum Requirements

1. Detect from one frontal view traffic light.
2. Recognize the state of the traffic light.
3. Traffic lights may be close or far from the camera.

## Possible Add-ons (Bonuses)

1. Detect and recognize multiple traffic lights
2. Handle different shaped lights (e.g. pedestrians)
3. Night mode
4. Arbitrary perspectives (different camera angles).

# Suggested Search Tracks and Keywords

You may use some/all of the following keywords as a guide (not restricted to them):

1. Hough transform
2. Morphological operations
3. Region properties
4. Color processing
5. Rigid shape recognition

**Test Images for Minimum Requirements**

Case1: Frontal view near traffic sign with simple background

Case2: Frontal view near traffic sign with complex background

Case3: Frontal view far traffic sign with simple background

Case4: Frontal view far traffic sign with simple background

# Test Images for Bonuses

Case5: Multiple traffic lights

Case6: different shaped lights (e.g. pedestrians)

Case7: Night mode images

Case8: Different camera angle