

IP'15 Apps Specs

Tracking Vehicle in video

Description

Main Idea

Vehicle detection and tracking are very important for several potential applications in security, including parking and speed control, and offender trailing. Automatic systems exist to aid law enforcement in the process, this process sometimes needs a combination of detections like: license plate and brand logo, with some other information like: car path, velocity and direction. In order to control speed for example if car's speed exceeded a certain limit the system notify that the car with the license plate = ID, has exceeded the speed limit. In this case, the system takes as input an arbitrary scene stream and automatically outputs information associated with vehicles in that scene.

Assume that the camera is fixed, the app should be able to detect the moving vehicles in the video, track them, compute their speed, direction and path until they get out from the scene.





Minimum Requirements

Given a **video** with fixed camera, the app should:

1. Detect and track vehicle
2. Detect the velocity (how many moved pixels per frame) and angle (moving direction) in degrees
3. Draw the path of movement

Possible Add-ons (Bonuses)

1. Detect multiple vehicles concurrently and track them correctly
2. Detect still vehicles in video
3. Deal with shadows in the video

Suggested Search Tracks and Keywords

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

- Motion detection
- Background construction
- Morphological operations
- Region properties
- Tracking Objects in a sequence of images

Test Videos for Minimum Requirements

Case1: Video containing a single moving vehicle with no other moving objects.

Case2: Video containing moving vehicles and humans, and system should just track vehicles

Case3: Video with different point of view (Rear/Above/Side)

Test Videos for Bonuses

Case4: Video containing multiple vehicles at the same time

Case5: Video containing both static and moving vehicles

Case6: Video containing shadows of vehicles

References

- Textbook Ch. 9: Morphological Image Processing
 - Textbook Ch.10: Image Segmentation
 - Textbook Ch. 11: Representation and Description
 - Textbook Ch. 12: Object Recognition
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