CVCS 2021 Project Proposal - Pedestrian Detection

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Introduction

This project aims to detect and recognize the presence of pedestrians on the street in the automotive field. Images are taken from camera vehicle.

The main tasks are:

1. Detect the pedestrians inside an image taken from the vehicle;
2. Estimation of the distance between the camera of the vehicle and the pedestrian;
3. Trigger an alert when the distance between the camera and the pedestrian is below a certain threshold;
4. Eventually, recognize the road signs and road strips that could be useful to indicate the presence of the pedestrians.

Requirements

- Image processing operator:
    - Filters to correct, remove noise and highlight the relevant elements in the image (edge detection ?);
- Geometric based algorithm:
    - Estimate of the distance between the camera of the vehicle and the pedestrian with a proper algorithm;
- Retrieval algorithm:
    - Recognize objects such as road signs and traffic lights
- DL based component:
    - Study the state of the art to understand which is the best approach.

Possible datasets

- Inria: https://project.inria.fr/aerialimagelabeling/contest/
- Caltech pedestrian: http://www.vision.caltech.edu/Image_Datasets/CaltechPedestrians/
- Google Maps Street View (by hand?)
- Waymo open dataset