

Assignment 2 : Pedestrian Tracking, Prediction, Analysis

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Task 1: While tracking, many of the pedestrians will be incorrectly tracked (the tracker tracking something else). What is the major reason for that and attempt to solve it.



A: The blob detector does not use any feature of the pedestrians. To solve the problem, we can apply some feature based detector like HoG or Haar.

Task 2: In some cases, when the pedestrians are occluded by other pedestrians or static obstacles, tracker loses accuracy. What can you do to solve or improve accuracy for both these cases separately.

A:

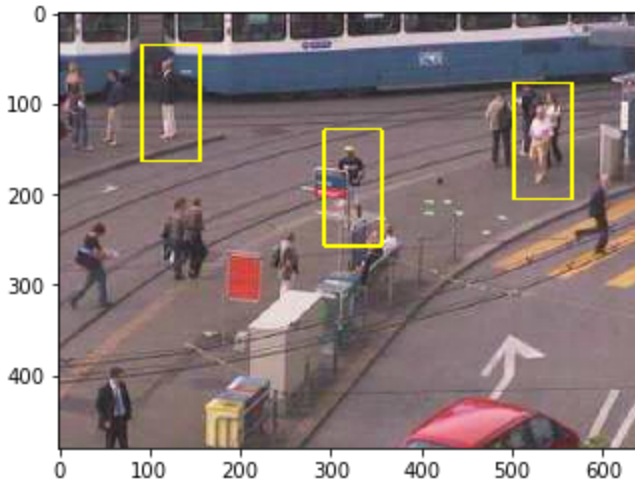
One possible solution for BLOB detection:

for the case of occluded scene, we can count the total blobs/pedestrians as N , when N changes as N' , we can set a label and wait until the total number go back to N .

For the overlapping problem in my case, I also tweak the threshold of the non-maximum suppression.

Task 3: Build a baseline prediction algorithm for pedestrians using a constant velocity motion model (estimate future paths assuming that pedestrians are moving in a constant velocity).

The tracking program is included in notebook hw2.ipynb



Task 4: Use Task 3 to improve tracking accuracy (reduce loss of tracking when pedestrian is partially/fully occluded).

Task 5: Analyse trajectories. Build baseline high-level trajectory understanding models (analyze positions and velocities to detect if people are standing, if two or more people are moving in a group etc)

Task 6 (Bonus): Compute accuracy of the tracker before and after the improved prediction (Task 3). Use a simple approach like distance between consecutive positions etc. (tracked vs ground-truth).