CSE463 Computer Vision

Homework 1

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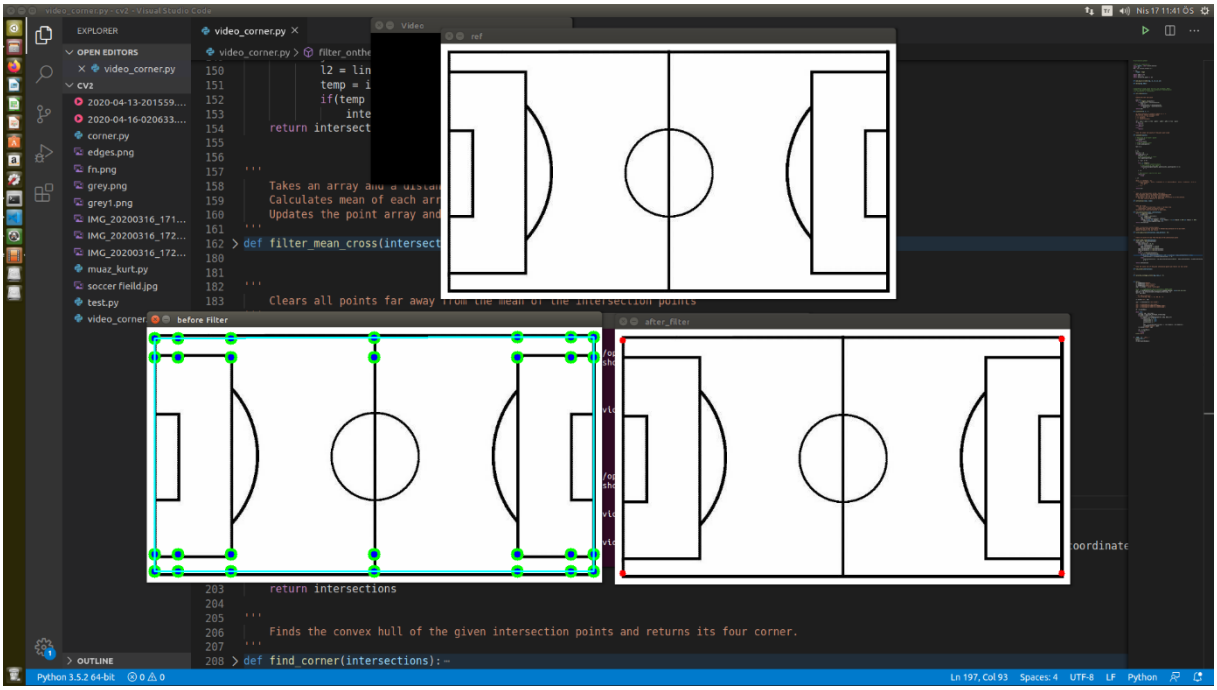
Problem:

Finding the homography matrix that converts the currently sampling image to the given reference image. After finding the homography, the sampling image will be multiplied with it. The calculations must be faster than 5 fps. Each sampling image and the result image should be shown to the user.

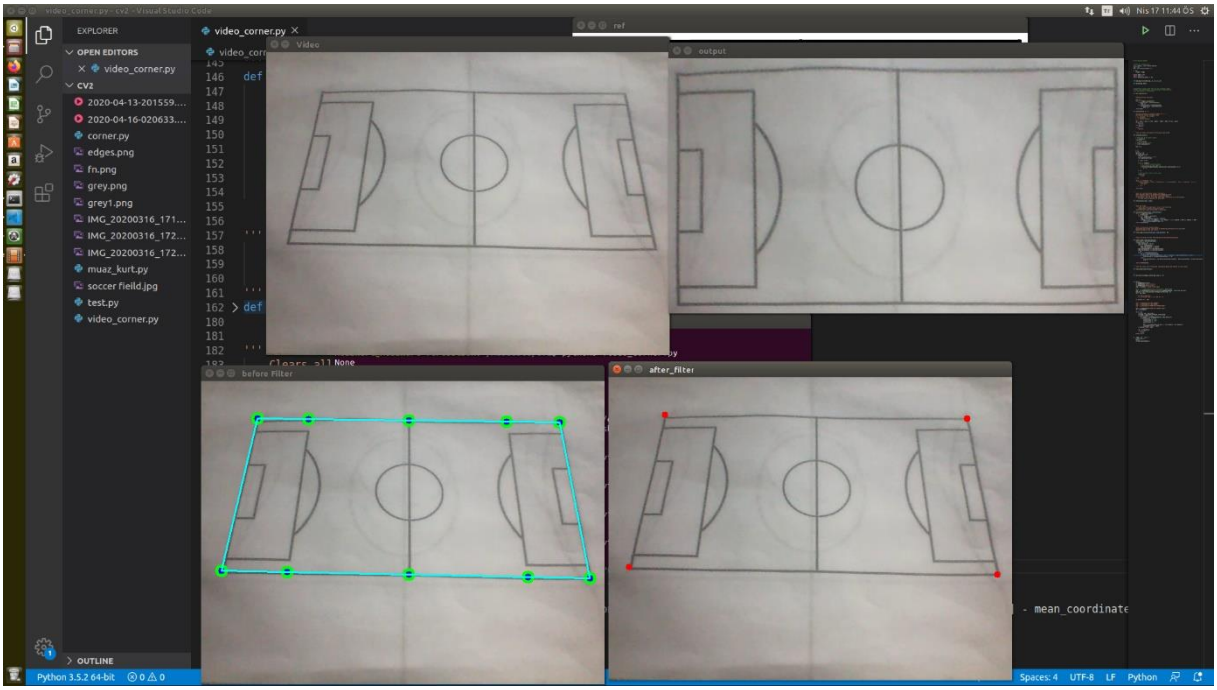
Solve:

Result of the Hought Transform of each image gives line points in given image. After finding all lines, intersections of it can simply be calculated with the homogeneous coordinate routines. But this gives us a lot of unnecessary intersection points. So, we should remove these noisy points with taking average point of each points in the declared margin. After that, we need to calculate the convex hull of those intersection points to generate four corners of an image. Then, the result of the convex hull, gives at least four points for calculating the homography. We then calculate left upper most to left lower most points as corners.

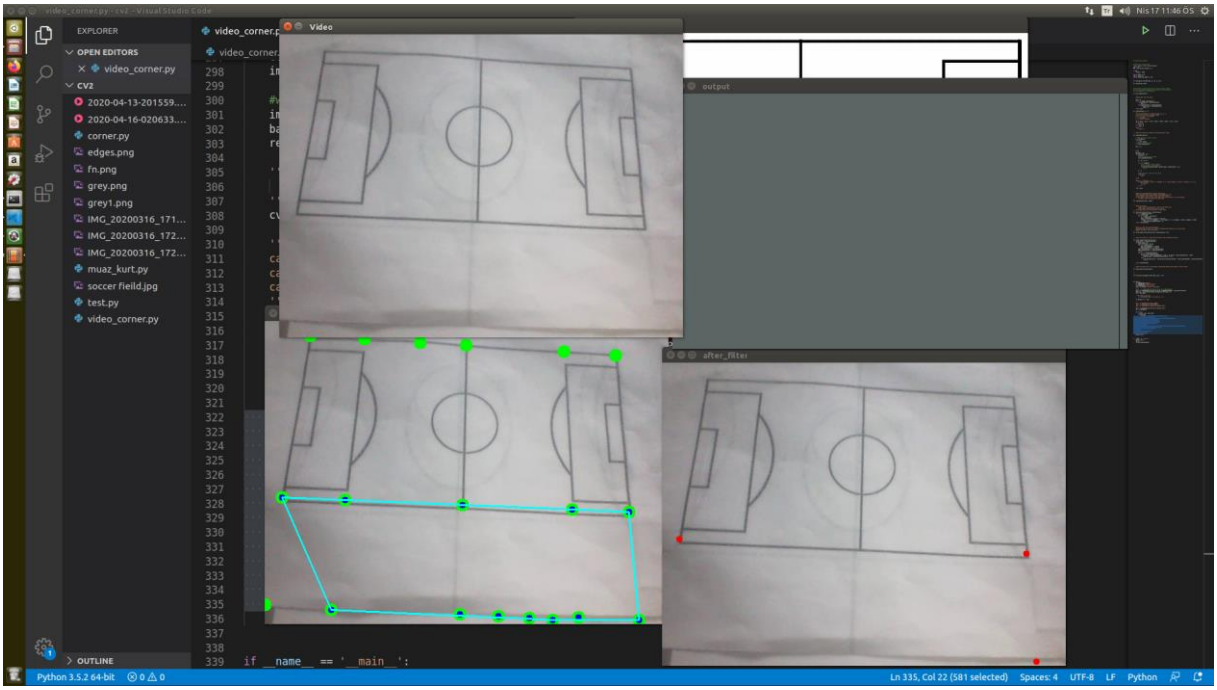
Calculations are faster than 5 fps.



This is the sample image that gives calculations of the corner points, convex hull and the chosen four points.



As an example, this is a frame of the given video. Everything looks fine but,



The algorithm gives some errors whenever another dominant line comes into the image.