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Progress report for week 4

Task:

Apply the pose estimation and ball tracking on videos and store the estimations in csv files

Implementation:

First, I use the scenedetect toolkit to detect scenes given by cuts and store their timestamps/frames in a csv file. This is done in the new detect_cuts.py file and values are stored in the scene_lists folder.

Then I can use these to generate pose estimations for every scene and write them into another csv file for every frame of the video.

For every scene, I determine the frame with the most pixels of the table's color in it and use that for the estimation, as it should be the one with the least occlusion. This works well in general and makes an occlusion fix unnecessary in most cases.

I use the error between the estimated corners and the projection of the 3D points(from t_vec and r_vec) to determine if the pose estimation worked well. If this error is too large, I mark the estimation for that scene as false.

After doing this for every scene, I can look at the wrong estimations and simply fix them, looking for other correctly estimated scenes with at least two very similar points. Then I can take the estimation which has the most similar points and use it for the badly estimated scene. This works, as a video contains many scenes from the same perspective, making it very likely that one of them has a correct estimation. Doing that is much simpler than trying to fix the occlusion and should work in most cases.

If this whole process still fails for a scene, it stays marked as a false approximation and can be sorted out. This happens for scenes shot from a really shallow angle and much occlusion. As it works well on most scenes, there still is enough data to work with. The next image is an example of one I can not deal with.

Problems:
I still have problems getting the ball tracker to run properly. The training worked (only without smooth labeling for some reason), but the demo seems to only do semantic segmentation. I am a little bit confused and will ask some questions tomorrow. Also, the code still has some small bugs which I could not fix in time.