CV hw7

Design Decision & Tradeoffs

- cv2.goodFeaturesToTrack(img1, mask=None,**dict(maxCorners=200, qualityLevel=0.6, minDistance=6, blockSize=3)) was used to detect keypoints.

- cv2.calcOpticalFlowPyrLK(img1, img2, features1, None, **dict(winSize=(8, 8), maxLevel=5,criteria=(cv2.TERM_CRITERIA_EPS | cv2.TERM_CRITERIA_COUNT, 10, 0.03))) was used to detect motion from keypoints.

- RANSAC algorithm was used to find inliers
    - iteration was set to be 50
    - Pixel distance allowed to be considered as inlier was set to be 2

- Camera was considered as in motion when the inlier count is strictly larger than 3.

Result & Evaluation

GOOD RESULTS

The focus of expasion (FOE) predictions denoted in orange dot are pretty accurate. The reason might be all these images have a clear motion oriented toward the center of the image and the road view was clearly toward the center. Also, The motion detected are also really accurate. Most moving cars were correctly deteted.

BAD RESULTS

Here are some less successful detetion results. The FOE prediction are still pretty accurate. However, the motion detections are often detecting the wrong objects. Some of them oredict trees, buildings, parked vehicles, or even fence as moving objects. The reason might be hier sensitivity of detection algorithm toward corners. All these objects mentioned have a clear contrast to the surrounding evironments. So, the algorithm falsely detect these objects as moving.