KTH Formula report

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1 Colour estimation of cones

Before I tried to classify the data, I used PCA to reduce the dimension and plot the data. With PCA we could see, that even in 2-dimensional space the data is linearly separable and therefore no complex classifier was needed. As the results from the PCA induced very strong correlations and therefore clustering along the principal components, I used a simple K-means clustering for the classification and could achieve 100% accuray.

2 Real-time cone detection on videos

Unfortunately my results for this tasks are quite bad. I couldn't even finish one video. However, in the following I will describe the different methods I tried.

2.1 Simple template matching

I simply cut out a cone from the video and used openCVs template matching. For the first video with the blue cone this worked fine, however it does not work for the orange cone as the program just does not stop running. The function which takes that long to execute is group rectangles (used to remove redundancy). Unfortunately I could not fix this bug.

2.2 Simple multi-scale template matching

Since the scale in which we see the cones does vary during the video, I used multi-scale template matching, to make it robust against the scale in-variance. However my Laptop was too slow to get some results.

2.3 HSV thresholding

I implemented HSV thresholding, but I run into the same problems as described in Section 2.1. As I haven't had much time to improve anything, this "solution" is not very elaborated.