Exercise sheet week 12 - Machine Learning I - 2015/16

Please send your submissions (runnable code, plots and written answers) **via email to teaching@ccc.cs.uni-frankfurt.de until Friday January 29th 2016**. One submission per student. Prepare to present your solutions in the exercise session. Students that are not able to explain their solutions may not be given credit on their submissions.

1 Change Detection (8 Points)

1. Open `http://wordpress-jodoin.dmi.usherb.ca/dataset2014/` . In the Baseline section, download the pedestrian dataset (`http://wordpress-jodoin.dmi.usherb.ca/static/dataset/baseline/pedestrians.zip`).
2. Implement a change detection algorithm of your choice
3. Calculate precision and recall on pixel-level
4. if your algorithm has a parameter, plot the ROC curve (one axis is precision, the other recall. compute these values for different values of the parameter)
5. Bonus: compare your algorithm to the ones submitted to the website using the metrics that are provided by the challenge

2 Shadows (2 Points)

1. The groundtruth data set contains labels for shadows
2. For a specific frame, plot the pixel-values of a shadow in the R,G,B cube. Select a frame where no shadow is present in the same pixels. Plot those values, too.
3. Describe the difference of both plots in no more than five sentences.
4. Bonus: Fit a distribution to the displacement of pixels that undergo the nonshadow-¿shadow, and shadow-nonshadow transitions.
5. Bonus: Use this knowledge to classify shadows and improve your classification results.