EN.520.412.01. Machine Learning for Signal Processing
Lab 7
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HW1 result:
Gender detector using average face:

Dimension	50	100	200	300	500
Accuracy	56%	56.15%	56.2%	52.6%	52.6%

Gender detector using all faces in training set:

Dimension	50	100	200	300	500
Accuracy	56.8%	56.4%	56.7%	56.9%	56.9%

Lab7:
Using KNN:
Different K and dimensions: it can be observed when K = 10, D = 100, we have 63.8% rate of successful detection which is much better compared to HW1.

	50	100	200	300	500
K = 1	56%	56.15%	56.2%	52.6%	52.6%
K = 5	62.4%	62.7%	61.9%	61.7	61.1%
K = 10	63.0%	63.8%	63.1%	63.4%	62.6%
K = 50	62.7%	63.3%	62.5%	62.2%	62.2%
K = 100	61.2%	61.4%	61.6%	61.9%	61.1%

Using SVM:

Fitclinear generates different answer when the dimension is above 200 because there are too many dimensions and the plane cannot converge.

	50	100	200	300	500
fitclinear	65.2%	67.6%	72%		
Fitcsvm(poly)	67.5%	68%	72.3%	73.4%	71.8%
Fitcsvm(gaussian)	50%	50%	50%	50%	50%

The best detection rate is 73.4% when using 2nd order polynomial kernel and D = 300.
It is 73.4%.
Note that the rate is decreased again at D= 500, so there might be another peak between D = 300 and D =500.