

Spring 2018	Report#03– 1/21/2018	Chen, Yueru
-------------	----------------------	-------------

I. Task achieved last week

- Research:
 - Experiment on Robust PCA and online PCA
 - Study feature selection methods
-


II. Feedback from Prof.

- Research on robustness and content-adaptation of the Saak transform
 - Study the feature selection methods, such as a KL divergence measure
-

III. Reports

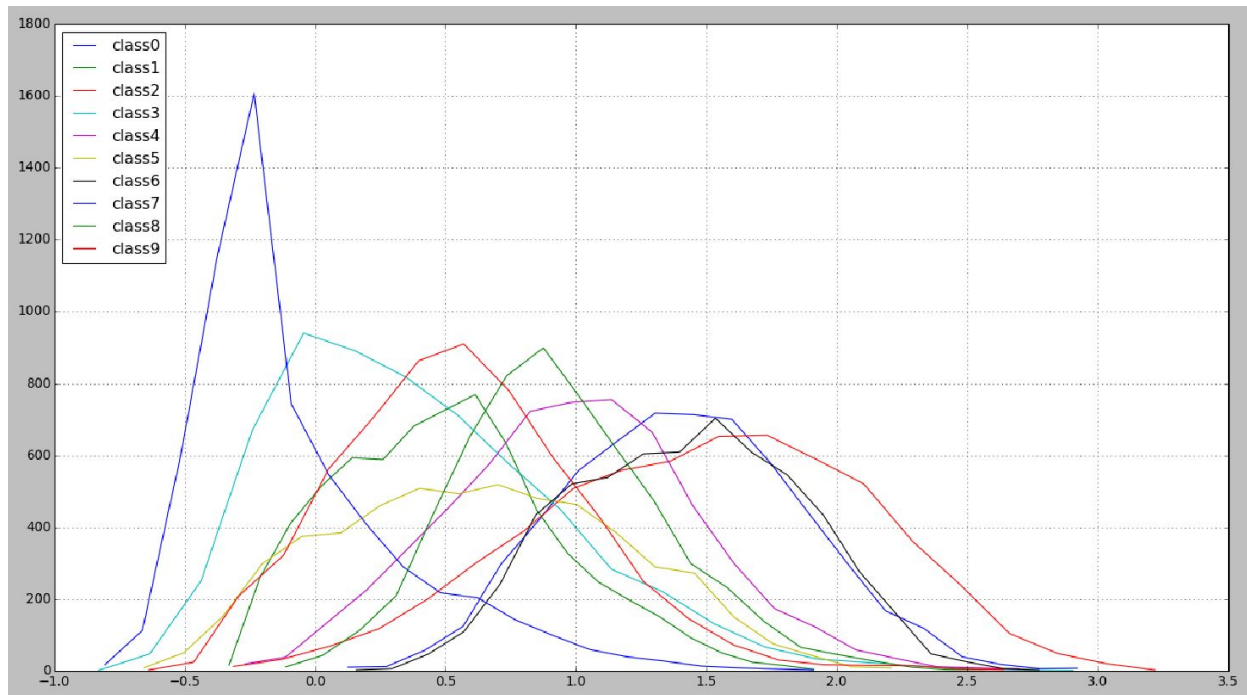
- Experiments on Saak Features

This week I analysed the Saak features of MNIST datasets. As shown in the Table 1, by changing Saak coefficients to the square of coefficients, the discriminant power is decreased. So then I visualized the distribution of the Saak features as shown in Figure 1. For the last stage features, the distribution of the feature are more similar to the Gaussian, but not for the early stage. For the first stage saak coefficients, we could find a lot zero values. Also the mean of the coefficients are not exactly zeros and the distributions are not symmetric respect to zeros. Those observation can explain the performance drop.

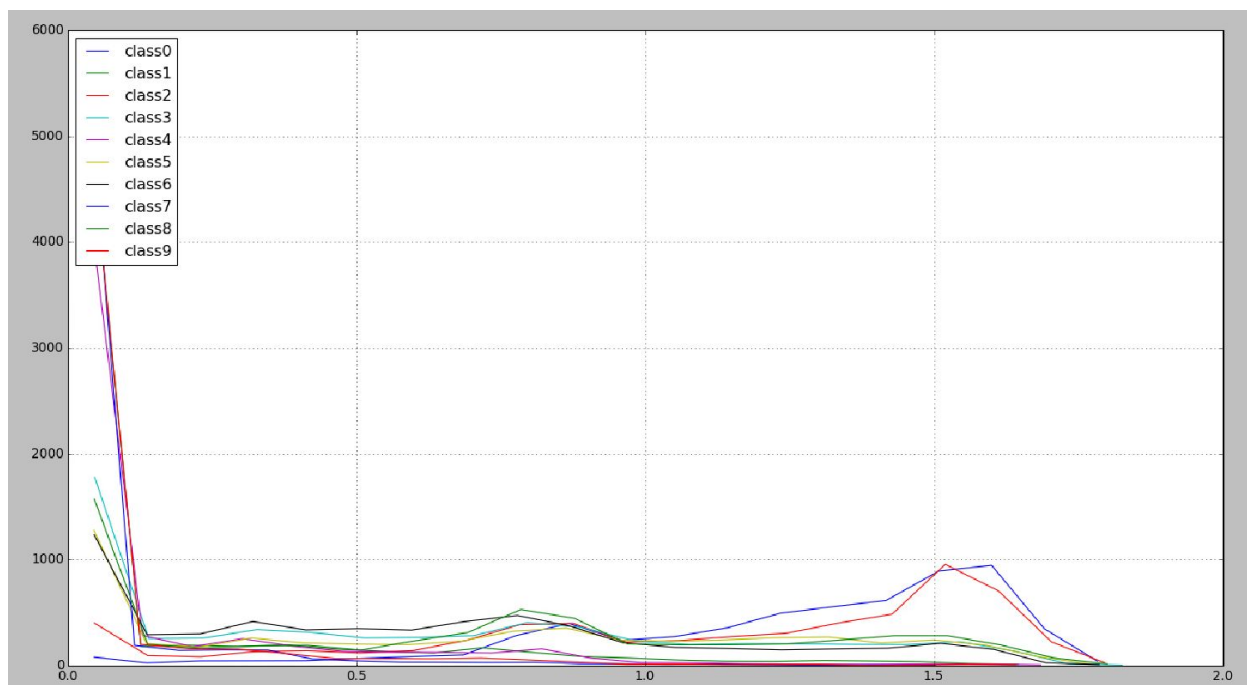
For the future, because we know the label of the digital images, we can try to compute Saak transform  for each class, then analyse the saak coefficients and test the classification results.

Reduced Feature Dim	Saak coefficient	Square of Saak coefficient
32	98.24	95.93
64	98.54	97.29
128	98.33	97.89

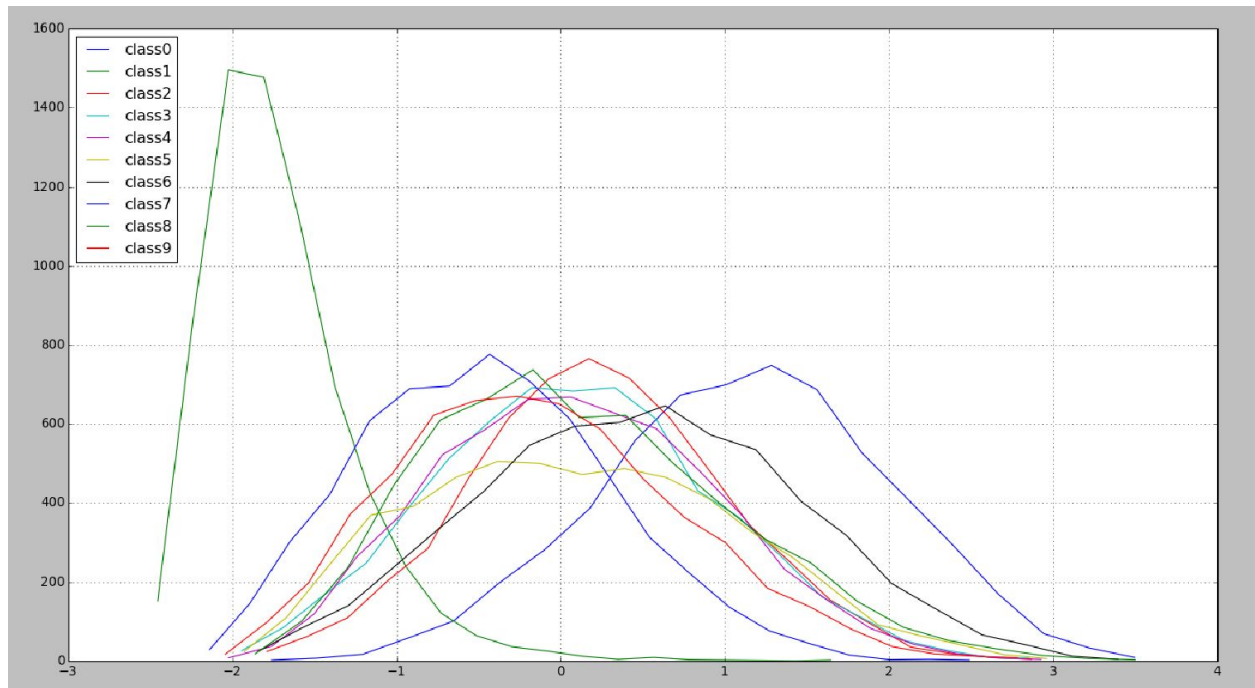
Table 1: classification accuracy on MNIST (%)



Feature with highest F-test score (fourth stage)



Feature with third highest F-test score (first stage)



Feature with 14th highest F-test score (last stage)

Figure 1

IV. Milestone

- ECCV paper: due on March 14
-

V. Plan for this week (***, **, *: order of high priority)

- Keep work on SR task of traditional datasets