**18794 PATTERN RECOGNITION**

**HACKATHON REPORT**

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In my algorithm, HOG and SVM methods are applied to the processing of the training data. SVM library was imported into this project to achieve the functions of support vector machines.

Firstly,I was trying using PCA with SVM, but it did not work well. In the experiment on training data of 3000 images, even 300 out of 400 features are selected, the accuracy was only 18.94%.

To improve the accuracy, I took another method to get the features. HOG performs much better than PCA on the training.

By traversing each images in the training data, and apply the function extractHOGFeatures() on each of them, A feature vector of 1\*36 was produced for each image.

To take an example, in the training of the data containing 12000 images, we will eventually get a matrix of 12000\*36 as the total features. 20 of them were selected to be applied in the training. As a result, the training got an accuracy of 74.96%.

The final result for the training of the three training data are listed in the form below.

|  |  |  |  |
| --- | --- | --- | --- |
| Training data | Features | Accuracy | ERR |
| 3000 | 36 | 84.82% | 15.18% |
| 12000 | 36 | 88.77% | 11.23% |
| 60000 | 36 | 90.61% | 9.39% |