华南理工大学

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The Experiment Report of
Machine Learning

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1. **Topic:** Logistic Regression, Linear Classification and Stochastic Gradient Descent
2. **Time:** 2017.12 .14
3. **Reporter:**周长鑫
4. **Purposes:**

1.Compare and understand the difference between gradient descent and stochastic gradient descent.

2.Compare and understand the differences and relationships between Logistic regression and linear classification.

3.Further understand the principles of SVM and practice on larger data.

5. **Data sets and data analysis:**

Experiment uses a9a of LIBSVM Data, including 32561/16281(testing) samples and each sample has 123/123 (testing).But the testing data loses its 123th column.

6. **Experimental steps:**
7. **Code:**

Logistic Regression:

Linear Classification:

8. **The initialization method of model parameters:**

Logistic Regression:

Linear Classification:

9.The selected loss function and its derivatives:

Logistic Regression:

Linear Classification:

10.Experimental results and curve:

Logistic Regression:

Hyper-parameter selection:

Predicted Results (Best Results):

Loss curve:

Linear Classification:

Hyper-parameter selection:

Predicted Results (Best Results):

Loss curve:

11. Results analysis:

Logistic Regression:

Linear Classification:

12. Similarities and differences between logistic regression and linear classification：

13.Summary: