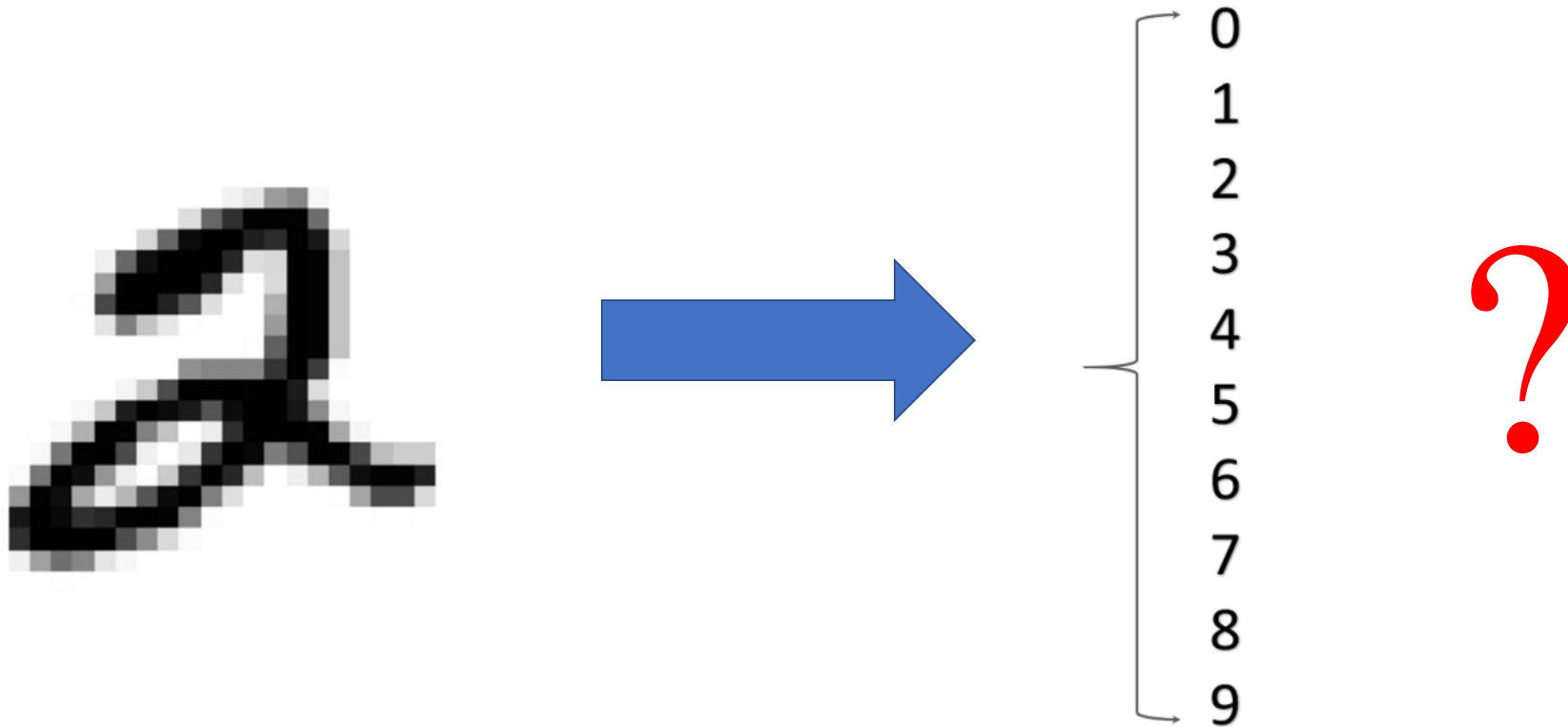# Project Report: MLP Classification

2018.04.07

Tran Dinh Son
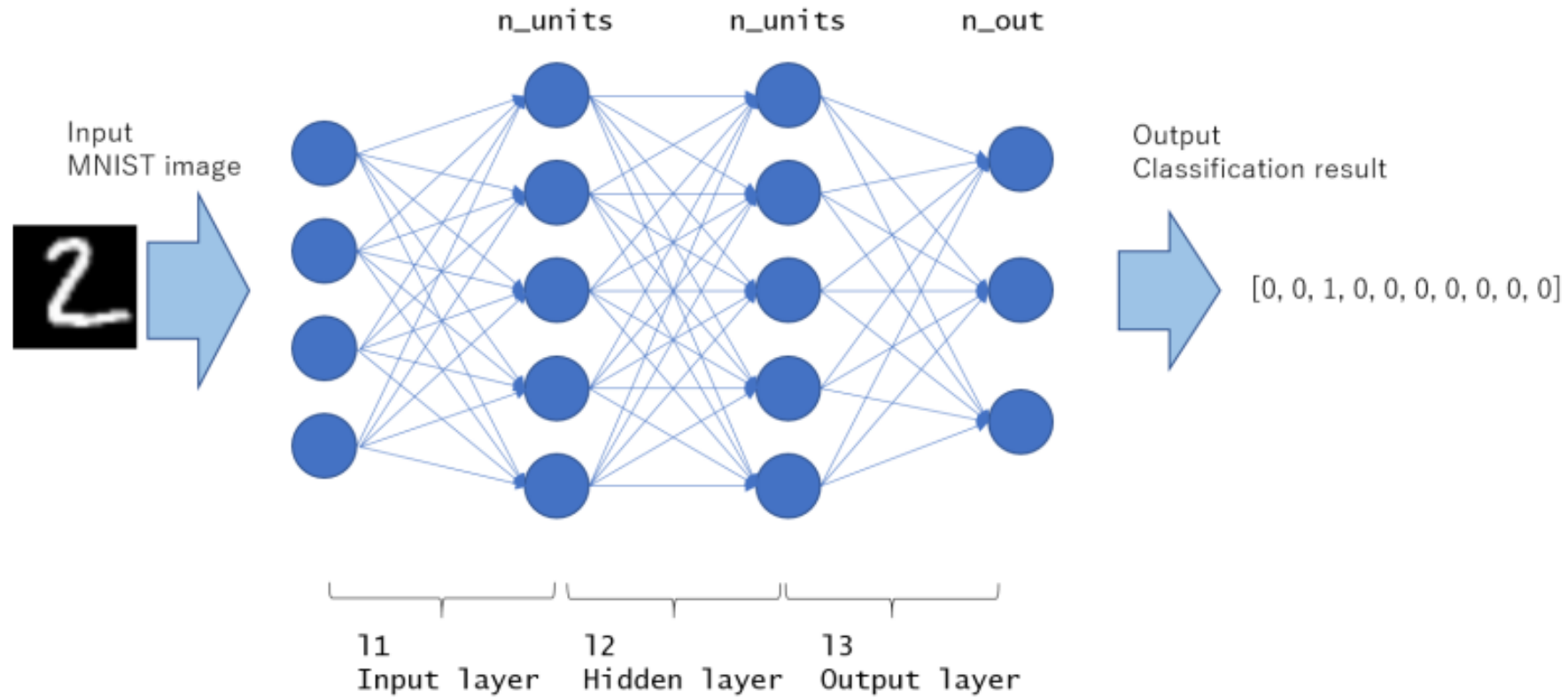
Problem Definition

MNIST dataset: **60,000 data** (training set) and **10,000 data (testing set)**

Applications: Human-machine interaction, surveillance, etc.

Proposed Method

- Multilayer perceptron (MLP)
- Decision Tree

MLP


MLP Classification

Results on MLP

Training time
- Training time with GTX 1080Ti is about 1.2873 minutes for 30 epochs
- Training time with GTX 1080 is about 1.4402 minutes for 30 epochs

Evaluate trained model

```
In [5]:  score = model.evaluate(x_test, y_test)
         print('Test loss:', score[0])
         print('Test accuracy:', score[1])

         9440/10000 [===========================>..] - ETA: 0sTest loss: 0.0941024177506
         Test accuracy: 0.9698
```

Test accuracy: **96.98%**

true label = 3, predicted label = 3
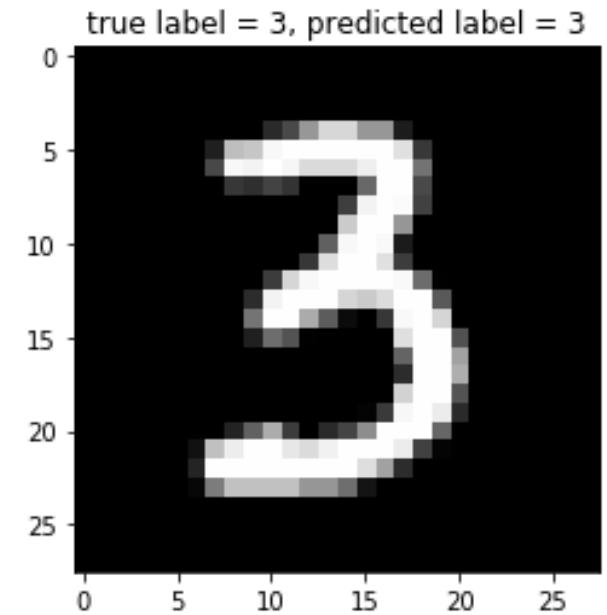
Predict test image with trained model

Results on Decision Tree

Training time

- Training time with GTX 1080Ti is about 32.76 seconds
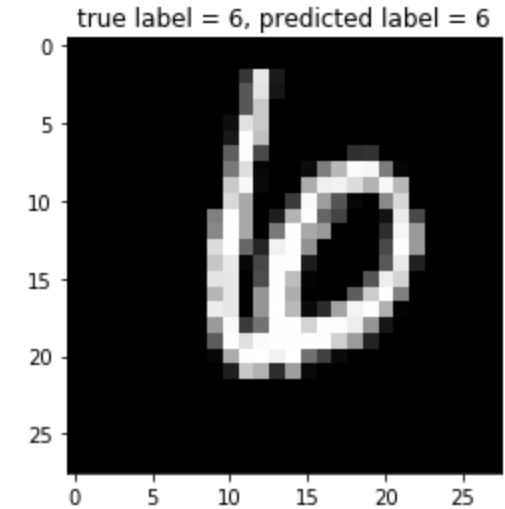
Evaluate trained model

Run the Prediction ¶

```
In [44]: pred_dt = clf_dt.predict(x_test.reshape(-1,28*28))
         print('Predicted', len(pred_dt), "digits with ccuracy: {0:.2f}%".format(accuracy_score(y_test, pred_dt)))

         Predicted 10000 digits with ccuracy: 0.88%
```

Test accuracy: **88%**

true label = 6, predicted label = 6

Predict test image with trained model

Comparison

Methods	Accuracy
MLP	96.98%
Decision Tree	88%

The materials for this section is on
https://github.com/trandinhson3086/Data-Mining-class

THANK YOU!