Deep Leaning 을 이용한 숫자 인식 알고리즘 성능 분석

201701313 남영우
지도교수: 유용석
Content

• Introduction
• Dataset
• Image Processing
• Model
• What I learned?
• Reference
• Discussion
Introduction

Human can recognize this picture expressed digit 1

But computer has no idea about this picture.

Then, How can Computer recognize this picture to digit 1?
Dataset

1. mnist data
   http://yann.lecun.com/exdb/mnist/
2. IAM hand writing set
   http://www.fki.inf.unibe.ch/databases/iam-handwriting-database
3. the chars74K dataset
   http://www.ee.surrey.ac.uk/CVSSP/demos/chars74k/

<table>
<thead>
<tr>
<th>Data_name</th>
<th>Shape</th>
<th>Train</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>mnist</td>
<td>55000</td>
<td>10000</td>
</tr>
<tr>
<td>1</td>
<td>Hand_write</td>
<td>440</td>
<td>110</td>
</tr>
<tr>
<td>2</td>
<td>real_image</td>
<td>Large Variance</td>
<td>445</td>
</tr>
</tbody>
</table>
Dataset

The 74k Chars data

IAM Hand Writing Data
[Pre-processing] Goal, Gaussian Blur

The 74k Chars  mnist  IAM Hand Writing Data
[Pre-processing] Convert to gray

The 74k Chars

IAM Hand Writing Data
[Pre-processing] ROI, Adjust Frame

IAM-ROI extraction

IAM-Adjust Frame
[Pre-processing] Resize and Downsampling

The 74k Chars  Mnist  IAM Hand Writing Data

Final shape (784)
Model

First data shape = 784 (28 * 28) (image shape)
Layer 1 data shape = 512
Layer 2 data shape = 256
Layer 3 data shape = 128
Layer 4 data shape = 64
Layer 5 data shape = 10 (Label shape)

Number of layers : 5

Optimize algorithm: Adam optimizer
Check accuracy: softmax cross entropy
Prediction Accuracy

MODEL ACCURACY

- Mnist_test
- IAM_test
- 74k Chars_test

- Mnist_train: 0.9817
- IAM_train: 0.9727
- 74k Chars_train: 0.9727
- 74k Chars_test: 0.8243
What I learned?

• How to process image
  - Difference about array’s size and shape
  - Image process libraries (ex. Opencv2, PIL, numpy, matplotlib...)
  - Read many Images in python and make dataset

• Difficulty of making General Model
Reference

Sung Kim- Tensorboard codes
https://github.com/hunkim
Mnist data
http://yann.lecun.com/exdb/mnist/
IAM hand writing set
http://www.fki.inf.unibe.ch/databases/iam-handwriting-database
the chars74K dataset
http://www.ee.surrey.ac.uk/CVSSP/demos/chars74k/
Professor Yongseok Yoo – Advisor
https://github.com/ys7yoo
Thank You!!!
Q / A