

Log

Week 1

19.04.18

- Feedback on project proposal
- Overview of project
 - simplification
 - binary image → numbers → straight text → Classify
- init; github - atom
- first test of charcter Segmentation

- Character Segmentation - Projection Histograms - OpenCV
 - By projecting the histogram of the binary image on the Y-axis, we can find where the sentences/lines of text appears. Following, a projection histogram on the X-axis can discover where the characters appear.

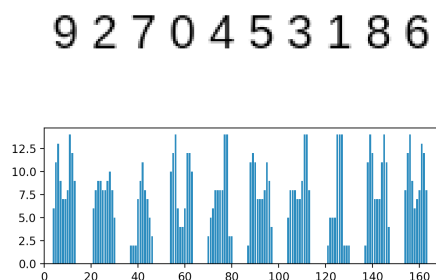


Figure 1: [0-9] segmented with projection histogram

- Classification - Perceptron neural network - TensorFlow
 - MNIST dataset - Dataset consisting of several thousand handwritten labeled numbers
 - * Numbers ranging from [0-9]
 - * Images are 28x28pixels
 - Hyperparameter tuning
 - * Activation function
 - * Number of hidden layers
 - * Nodes in hidden layers
 - * Cost function
 - * Optimization function
 - * Learning rate
 - Theoretic accuracy of the network with 2 hidden layers 98%
 - * Measured accuracy 97%

```
4690-p2018|Sadegh(master)$ p3 src/find_symbol.py
Model restored
Extracted text: 9220453189
```

Figure 2: First output with classification. input see Figure 1

- Rotation of text
 - Hough transform
 - *cv2.minAreaRect()*
- How to distinguish between upside-down, and verticle vs horisontal text segments
 - Classify in all 4 rotations, and choose the classification with highest avrage confidence
- Classification - Perceptron neural network - Error
 - Error rate too high, test-set accuracy 97%, validation set accuracy < 50%
 - CNN - TensorFlow Estimator API
 - * Challenging documantation; load/save models
 - Dataset - FNIST - Group contribution
 - * Dataset including several fonts
 - * English alphabet, and numbers [0-9]

- Text segmentation
- Classification
 - CNN solution on character classification
 - EMINST - ByMerge - ByClass
- Rotation of text
- Dataset - FNIST
 - Custom font dataset, bc machine written vs handwritten
- Dataset - RotSet
 - To classify rotation of the characters

- Report writing
- Assembly of the project components