AIMS research internship
4th, Oct., 2016

The aim of this study is to understand artificial intelligence such as machine learning, pattern recognition, and deep neural network with Python. The following are the plans and contents of this study:

1. Step1 (Oct.)

Enrich your experience on Python and Pattern Recognition. Firstly, investigate recognition performances (accuracy) of various classifiers.

- Install Python
- Go to `http://scikit-learn.org/stable/index.html`
- Install sciki-learn
- Select some classifiers and try them on any dataset such as iris: `http://scikit-learn.org/stable/tutorial/basic/tutorial.html`

2. Step2 (Nov.)

Enrich your experience on Python and Chainer. Firstly, investigate a recognition performance (accuracy) of deep learning on the MNIST dataset.

- Install Chainer: `http://chainer.org/`
- Go to `example/mnist`
- Run `python train_mnist.py`

In the above script, `batchsize`, `n_epoch`, and `n_units` are most fundamental parameters. Investigate how the performance will change with respect to these parameters. A simple way of showing your results is to illustrate the performance by a graph as shown in the following website:
`http://aidiary.hatenablog.com/entry/20151005/1444051251`.
Summarize your consideration on given results in your report.

3. Step3 (Dec.)

Adopt the same experiments described above to a different dataset, i.e., investigate the performance on the CAIFAR dataset (color image classification). In this experiments, the following GitHub will be helpful for you:
`https://github.com/mitmul/chainer-cifar10`.
Summarize your consideration on given results in your report.

4. Step4 (Jan.)

Edit or modify network structure in your scripts as your own style to improve recognition performance. Try to apply them to the MNIST and CIFAR datasets and summarize your consideration in your report. The following site may be helpful for this study:

- `http://docs.chainer.org/en/stable/tutorial/index.html`
- `http://multithreaded.stitchfix.com/blog/2015/12/09/intro-to-chainer/`
- `https://github.com/tochikuji/chainer-libDNN`

5. Notice

You can write your report by any editors (Word, LaTeX, etc.). Style and pages of your report is not restricted. Please report the progression status of your study every Tuesday at 13:00 in the room 303 of building no.10.