
BT 6270: Computational Neuroscience

Assignment No: 3

General Instructions

- ✓ The goal of this assignment to understand convolutional neural networks taught in the class.
 - ✓ This is an individual assignment.
 - ✓ You will be provided with CNN code developed in Matlab environment.
 - ✓ Play with the code to understand its working and performance on the given data set.
 - ✓ Document your observations
 - ✓ Submission instructions are given at the end of this document
 - ✓ **Submission deadline: 25th October, 2018 (23:59).**
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- [1] Download the MNIST dataset from the link: <http://yann.lecun.com/exdb/mnist/> to the distributed folder where code is present. Report the dataset details.
- [2] Distributed code has one set of 'conv-pool' layer followed by fully connected layer.
 - i. Run the code ('**Traincnn**') and report the performance and training time (without any changes in the code). Visualize the weights and report the weight patterns.
 - ii. Visualize the feature maps and identify which of them respond to edges or lines.
 - iii. Restrict your training set to first 10,000 images. Make changes to the following, one after other and report the trained network performance in form of a table. (3 variations each)
 - a. No. of epochs ('**e**' in Traincnn)
 - b. No. of feature maps in the convolution layer ('**numFilters**' in Traincnn)
 - c. Convolution layer filter dimension ('**FilterDim**' in Traincnn).

Submission Instructions

Enclose in a single zip folder the following:

1. A code to visualize the weights and feature map using the trained weights.
2. Include the trained weights.
3. A detailed report with the all the necessary images

Submit the compressed zip or tar file named as <ROLLNO>_A3.zip to any one of the following address. **Please note do not drop your assignment on to the group.**

[bhadr.edu@gmail.com](mailto:bhadra.edu@gmail.com) or anila.gundavarapu@gmail.com.