

Final Project

ECBM E6040, Professor Aurel A. Lazar

Deadline: 11:59PM, May 5th, 2016

INSTRUCTIONS: For the final project, we have compiled a list of papers that will provide you with an extensive exposure to applications of Deep Learning to Object Recognition. Students can form a team of 1-4 members. Each team can pick one of the papers and will be asked to review and recreate the results from the paper using Theano. However, more work in terms of recreating all the results from the paper and achieving the best performance will be expected from teams comprising total of 4 members. Submission should include the source code, Jupyter notebook, and a report. The source code should be well-documented, and the Jupyter notebook should demonstrate that your code is executable and your results are reproducible.

Each group should create a **private** Bitbucket repository for the final project, and grant the read access of the repository to the account **E6040TA**. The repository should contain all the source code and the Jupyter notebook. Every member in the group should contribute to the repository. Please organize the repository nicely, and provide README files.

Submit the report to Canvas. Please **DO NOT** put your report in the repository, and please **DO NOT** submit your code to Canvas.

The final report should

- Summarize the paper and provide a brief review of the relevant literature.
- Recreate results in terms of test accuracies and all plots and figures in the paper. Also include training time for all models you present in the report.
- Provide a comprehensive discussion of your results and compare them with the results of the paper. Discuss whether you were able to get the same or better results than those described in the paper. If not, provide a discussion on what could have been done to improve your results.
- Discuss what insights you were able to gain from your implementation/experiments.
- Summarize in detail the contributions of each team member in terms of coding and writing the report.

We are aware of the code available online for the provided publications. Please note that you are not allowed to reuse code available online and are expected to implement the final

project in its entirety by yourself. You may however reuse any code from the homework assignments.

The project is due at 11:59 PM on Thursday, May 5th, 2016.

Finally, if your team would like to work on a project outside of the papers provided, you will have to make a proposal and get the project approved from the instructors beforehand.

Please refer to the post on Piazza for information regarding group formation.

List of Papers

1. [ReNet: A Recurrent Neural Network Based Alternative to Convolutional Networks](#)
2. [Deep Networks with Stochastic Depth](#)
3. [Spatial Transformer Networks](#)
4. [Striving for Simplicity: The All Convolutional Net](#)
5. [BinaryConnect: Training Deep Neural Networks with Binary Weights during Propagations](#)
6. [Recurrent Convolutional Neural Network for Object Recognition](#)
7. [Spectral Representations for Convolutional Neural Networks](#)
8. [Regularization of Neural Networks using DropConnect](#)
9. [Network in Network](#)
10. [ALL YOU NEED IS A GOOD INIT](#)
11. [Multi-Digit Number Recognition from Street View Imagery Using Deep Convolutional Neural Networks](#)
12. [Convolutional Neural Networks with Low-Rank Regularization](#)

GOOD LUCK!