Course Project Description

Deep Learning Decal, Fall 2017

ABSTRACT

The course project is intended to be an experience for your own personal exploration of a particular application or method in deep learning which excites you. You can perform a literature review on a topic and discuss the current status of the field and where it is going, implement an existing method on a new dataset, perform novel research if you have enough motivation, or something else reasonable. Please talk to us about your idea if you are unsure.

Forming teams

Your first step in starting this project is to create a team! Team sizes should be around 2-3, but we are open to exceptions with good reasons.

Project topics

There are a lot of very interesting things going on in modern deep learning research. Part of this project will involve exploring your interests and selecting a project topic which excites you.

Below is a list of possible possible topics. You may pick something from this list, or chose your own topic. When choosing a topic, please make sure the idea is feasible (i.e. that you have data and some type of metric to quantify performance of your experiments).

Project ideas:

- Sequence-to-sequence models
- Machine translation
- End-to-end memory networks
- Deep speech
- Residual networks
- Deep reinforcement learning
- Fourier / wave nets
- Face2Face

- Neural storyteller
- Music generation
- Generative adversarial networks
- Applications in health care
- Applications in finance
- Neural architecture search
- Bayesian optimization methods

Useful references:

- Fathom: Reference Workloads for Modern Deep Learning Methods: https://arxiv.org/pdf/1608.06581v1.pdf
- Awesome deep learning: https://github.com/ChristosChristofidis/awesome-deep-learning
- cs231n past projects: http://cs231n.stanford.edu/2016/reports.html
- Deep learning gallery: http://deeplearninggallery.com/
- Guidelines for Writing a Good NIPS Paper: https://nips.cc/Conferences/2014/PaperInformation/EvaluationCriteria
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Deliverables

There will be 5 deliverables for the project, which are described in detail below. They will be turned in via gradescope by 11:59 PM on their respective due dates, except the presentation. Please abide by the page limits.

All deliverables should be neatly typeset in LaTeX, and the quality of your writing and style will be a component of your grade. You should be proud to put your name on any work you produce!

Proposal - Due October 11, 2017

Submit a 1 page proposal describing your project's goals, and please provide a time line of addressing the problem.

The proposal should be well-thought and contain the following information:

- Problem statement and background

- A discussion of related work

- The dataset you will use

- The tools you will use

- How you will evaluate your model / results

Interim I - Due October 25, 2017

Submit a 1 page progress report showing what you have done and what you plan to do.

Interim II - Due November 8, 2017

Submit a 2 page write up, with preliminary figures and results.

Final report - Due November 29, 2017

Submit a research paper of at least 5 pages.

Elevator-pitch-style presentation - Due November 29, 2017 BEFORE CLASS

Part of being an effective researcher and engineer is the ability to communicate your work clearly - and sometimes quickly. Please prepare a **5 minute** presentation about your project to present in front of the class on the last day. The presentation should summarize your paper and highlight some of the most interesting results.