Variational Continual Learning:

Subject: [MLMI4] Team 5 Paper Selection

Our group intends to further explore Variational Continual Learning (Nguyen et. al).

We intend to approach our exploration in two phases, Exploration and Replication, with an optional extension phase if time permits.

The exploration phase will begin with reviewing the paper and analyzing the reference implementation found in <https://github.com/nvcuong/variational-continual-learning>.

After review of the reference implementation, we intend to apply VCL to a toy regression task (a single hidden layer network operating on simple synthetic data) in order to visualize network behavior and better comprehend the ideas presented in the paper.

Given thorough understanding of the reference implementation, we propose to to replicate the results of both the “Deep Generative Model” and “Deep Discriminative Model” experiments enumerated below:

* Permuted MNIST Classification
* Split MNIST Classification
* MNIST Generation
* NotMNIST Generation

Time permitting, we strive to investigate one or more of the following extensions:

* Applying VCL to CNNs
* Using advanced rehearsal/replay techniques. Eg. [Variational Generative Replay (VGR)](https://arxiv.org/pdf/1902.06494.pdf)
* Improving performance using likelihood-tempering Eg. [Improving and Understanding Variational Continual Learning](https://arxiv.org/abs/1905.02099)