

# CI: Term Project Proposal

**Project title:** Evaluation of Deep Convolutional Generative Adversarial Networks.  
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## SUMMARY:

We will carry out an in-depth analysis of Deep Convolutional Generative Adversarial Networks (DCGAN) by evaluating a small number of recent papers and carrying out a small scale experiment, e.g. generating handwritten numbers from the infinite MNIST dataset [8]. We will identify potential application areas that may not have been considered in recent research.

Deep learning and deep convolutional networks have so far mostly been used in a supervised way to classify data. DCGAN introduce a promising way of learning features from given examples unsupervised. So far most of the research is concentrated on image generation, but there is a variety of other application domains. For example DCGANs can be used to generate data to pre-train neural networks where labeled data is expensive to obtain. This approach is interesting to us since it is a recent development with ongoing research.

## RELEVANT REFERENCES AND RESOURCES:

### Papers:

- [1] Unsupervised Representation Learning with DCGAN:  
<https://arxiv.org/pdf/1511.06434v2.pdf>
- [2] Generative Visual Manipulation on the Natural Image Manifold:  
<https://arxiv.org/pdf/1609.03552v2.pdf>
- [3] Generative Adversarial Nets:  
<https://arxiv.org/pdf/1406.2661v1.pdf>

### High level descriptions:

- [4] <https://openai.com/blog/generative-models/>
- [5] <http://blog.aylien.com/introduction-generative-adversarial-networks-code-tensorflow/>

### Example Implementations / Experiments:

- [6] Implementation of paper [1]:  
[https://github.com/Newmu/dcgan\\_code](https://github.com/Newmu/dcgan_code)
- [7] Generative Visual Manipulation on the Natural Image Manifold  
<https://people.eecs.berkeley.edu/~junyanz/projects/gvm/>
- [8] <http://leon.bottou.org/projects/infimnist>