Implementing GAN on MNIST and SVHN

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Abstract

We implement GAN on MNIST and SVHN dataset. The generated samples for both datasets are great although it takes quite some time to train the model. To help the model converge faster, we implement WGAN as well. The result **TBD**.

1 Introduction

The core ideas of GAN

Make sure to understand Figure 1 and Algorithm 1 of the paper.

Also, why we want G to minimize and D to maximize V (G, D).

2 Implmentation on MNIST

2.1 Architecture

Generator and discriminators and hyperparameters

2.2 Result

Training process in tensorboard

the generated samples compared with training dataset and figure 2a in paper

3 Implmentation on SVHN

3.1 Architecture

Generator and discriminators and hyperparameters

3.2 Result

Training process in tensorboard

the generated samples compared with training dataset

How is the quality compared to your GAN on MNIST? If the training does not go well, what failure modes do you see?

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4 WGAN

The benefits of WGAN

4.1 WGAN on MNIST

xxx

4.2 WGAN on SVHN

xxx

5 Summary

xxx

References

References follow the acknowledgments. Use unnumbered first-level heading for the references. Any choice of citation style is acceptable as long as you are consistent. It is permissible to reduce the font size to `small` (9 point) when listing the references. **Remember that you can use more than eight pages as long as the additional pages contain *only* cited references.**

[1] Alexander, J.A. & Mozer, M.C. (1995) Template-based algorithms for connectionist rule extraction. In G. Tesauro, D.S. Touretzky and T.K. Leen (eds.), *Advances in Neural Information Processing Systems 7*, pp. 609–616. Cambridge, MA: MIT Press.

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[3] Hasselmo, M.E., Schnell, E. & Barkai, E. (1995) Dynamics of learning and recall at excitatory recurrent synapses and cholinergic modulation in rat hippocampal region CA3. *Journal of Neuroscience* **15**(7):5249-5262.