

Reading is all you need

Textbooks and Articles

- [Mathematics for Machine Learning Book](#) is a must to read. Especially, first part of the book covers mathematical concepts and tools that is used while 'doing machine learning' and it is well written in the sense of readability.
- [Understanding Deep Learning](#) is great handbook for daily reading of deep learning. One of the greatest features that distinguishes this book from others is it has great visualization of concepts and notebooks (they're still keep adding for some chapters). There are chapters for generative models like GANs, Variational AE, Normalizing Flows and Diffusion models. Also, there are chapters for network architectures like transformers and GNNs.
- [Deep learning](#) is an article by Yann LeCun, Yoshua Bengio and Geoffrey Hinton. It is an 4-pages and old-dated (2015) Nature article. Not a must to read :)

Articles in Generative models

- [An Introduction to Variational Autoencoders](#) is bundle from Kingma and Welling. Original authors of VAEs. I just saw it and wanted to add.
- [Auto-Encoding Variational Bayes](#) is original paper of the algorithm.
- [Neural Discrete Representation Learning](#) VQ-VAE paper. Check out vector quantization before you read it.
- [NVAE: A Deep Hierarchical Variational Autoencoder](#) is a nice paper from NVIDIA. Deep Hierarchical VAEs are related to diffusion models in some sense.
- [GANs](#) original paper. You can also read [here](#) to learn about basic of GANs and its PyTorch implementation.
- [A Style-Based Generator Architecture for Generative Adversarial Networks](#). GANs are rising.
- [Understanding Diffusion Models: A Unified Perspective](#) shows different perspectives of diffusion models. This is a must to read for diffusion models.
- [Variational Inference with Normalizing Flows](#). Let's do variational inference with flows...
- [Deep Unsupervised Learning using Nonequilibrium Thermodynamics](#) is the first paper about diffusion models(?). Diffusion models are trying to emerge.
- [Denoising Diffusion Probabilistic Models](#). They are here and they generate high quality images but there are still some problems about it.
- [Diffusion Models Beat GANs on Image Synthesis](#) GANs are beaten?
- [Denoising Diffusion Implicit Models](#). Now they are x50 times faster than before.

Watch

- [Two Minute Papers](#)
- [Coffee Bean](#)
- [Yannic Kilcher](#)

Useful websites

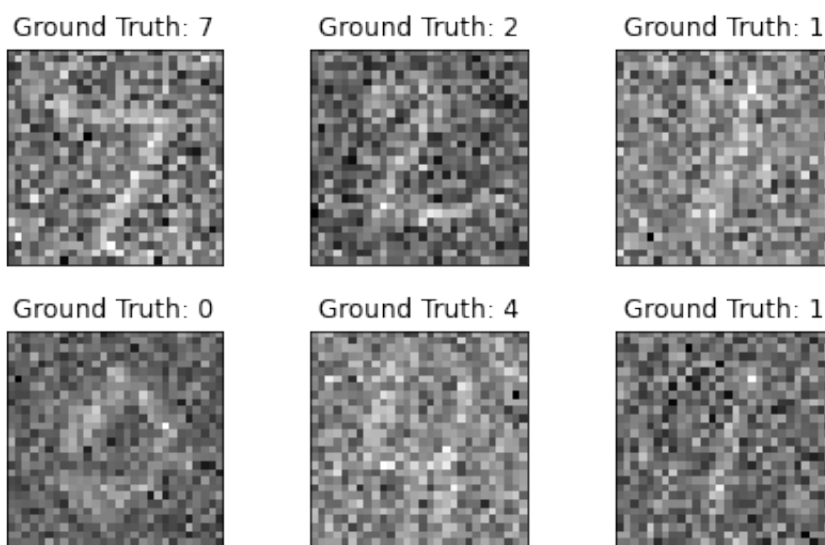
- [Papers with code](#) is a platform that pairs research papers in the field of machine learning with their corresponding code implementations.
- [Connected papers](#) is a tool that visualizes the relationships between academic papers as a graph, helping researchers explore and understand connections between different research works within a specific field.
- [Course notes of Deep Generative Models](#) from Stanford

Optional tiny Task

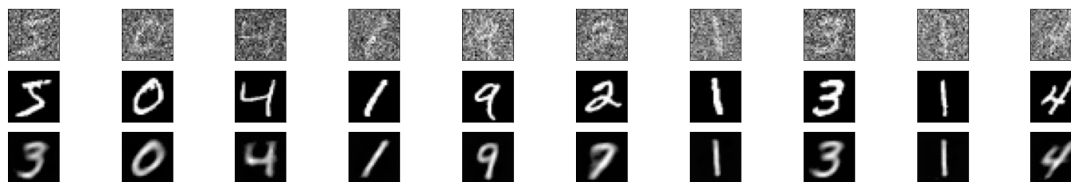
Denoising AutoEncoder

Create an autoencoder model that takes input in the form of noisy images and produces denoised images as output. Design the architecture and loss function for the model. You can use both fully connected layers and convolutional layers as needed.

Input:



Results:



- The first row represents input data, which the model receives as input for its processing.
- The second row consists of the ground truth labels or target values associated with the noisy images.
- The third row contains the model's output, which is its prediction or result after processing the input data.