

Machine Learning Laboratory

Session 7 - Denoising Diffusion Probabilistic Models

Preparation

Of course the DDPM Paper [arXiv](#). Here is a more detailed tutorial-style paper with many derivations: Understanding Diffusion Models: A Unified Perspective [arXiv](#). More practical tutorials on Diffusion Models can be found from [Hugging Face](#) (we will also use some of the codes in the coding session).

To better understand diffusion models, some prior knowledge in probability theory is recommended to be learned or revisited:

1. Bayes' theorem - [Wikipedia](#)
2. Kullback-Leibler divergence - [Wikipedia](#)
3. Evidence lower bound - [Wikipedia](#)

Last but not least, Fréchet inception distance (FID) is the metric used in many generative network papers to evaluate the performance. Read through the doc from [torchmetrics](#).

Further Reading

[Optional] Denoising Diffusion Implicit Models: [arXiv](#). Latent Diffusion Models (a.k.a. Stable Diffusion): [arXiv](#). And tons of other diffusion model papers :)