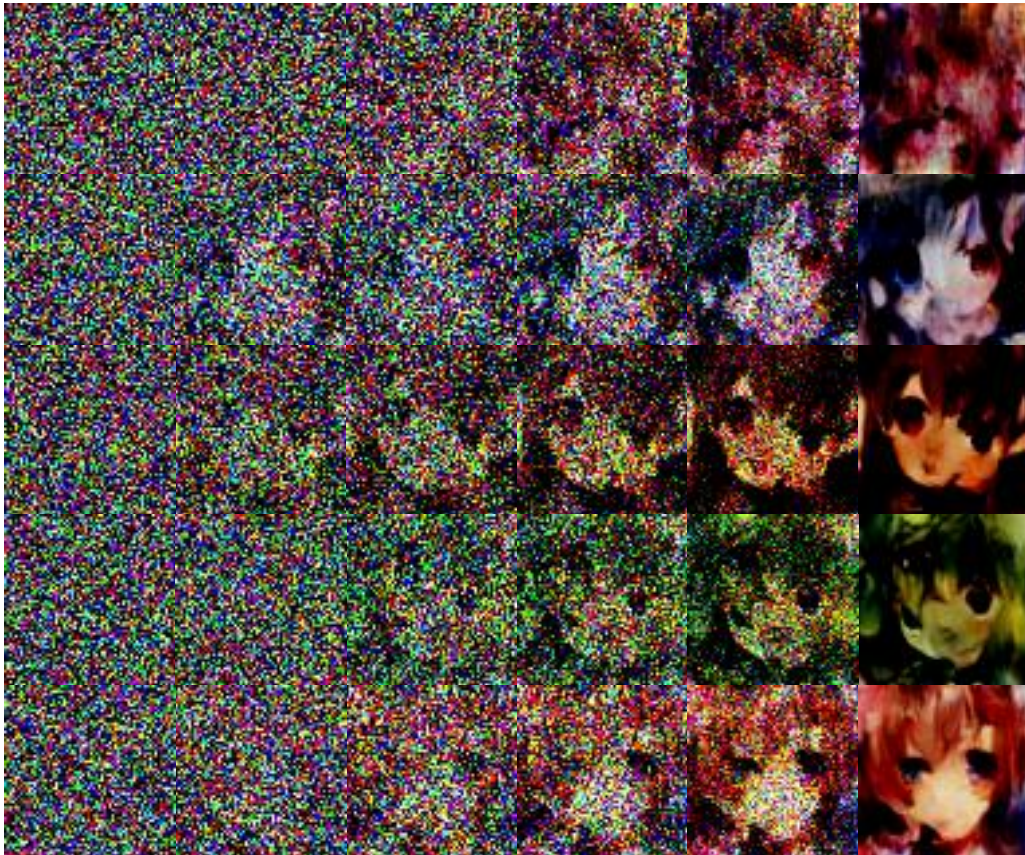


ML HW6 Gradescope

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Q1.



As you can see, the diffusion model slowly remove the signal and then get the better pictures. Since I only train 5000 steps, the final pictures wouldn't be as great as the result that using StyleGAN. But we can still the improving of the quality of the pictures.

Q2.

One of the main differences between DDPM and DDIM is the way in which they **model the density** of the data. DDPM models the density **explicitly**, meaning that it tries to directly estimate the probability density function of the data. DDIM, on the other hand, models the density **implicitly**, meaning that it does not directly estimate the probability density function, but instead uses a deep neural network to generate samples that are similar to the data.

One advantage of DDIM over DDPM is that it is generally much **faster**. This is because DDIM generates samples using a neural network, which can be efficiently trained using techniques such as backpropagation. In contrast,

DDPM requires the use of more computationally expensive techniques such as Markov Chain Monte Carlo (MCMC) sampling.

However, there are also some potential drawbacks to using DDIM. For example, because DDIM does not directly estimate the probability density function of the data, it may be less accurate in some cases than DDPM. Additionally, because DDIM generates samples using a neural network, it may be more difficult to control the quality of the generated samples.

Reference

<https://chat.openai.com/>

<https://zhuanlan.zhihu.com/p/565698027>