

**NTUST, CSIE**  
**Generative AI: Principles and its Applications (CS5170701),**  
**Fall 2025**

Homework 1 (10pts)

**Due date:** Oct. 8

**Question 1.1.** Choose three GAN models and compare their performance. You may choose any three, or choose one from the original GAN in 2014 and two other advanced ones from the latter years. More details are as follows.

- (a) The advanced GANs can be from some on the slides, such as [DCGAN](#), WGAN ([Wasserstain GAN](#)), [CycleGAN](#).
- (b) The datasets to be used to evaluate the focused models may include MNIST, CIFAR-10 and CIFAR-100, to name a few. Some information can be found at [MNIST Dataset](#) and [CIFAR-10 and CIFAR-100 datasets](#).
- (c) We need to find a way to evaluate how good the GAN model may perform. Some of the possible evaluation metrics include: Fréchet Inception Distance (FID), Inception Score (IS), Peak Signal-to-Noise Ratio (PSNR), etc.
- (d) After all, you should explain why you may have a good performance on one rather than some other GANs. This part of discussion should be around one page long and it is the main part for our evaluation.
- (e) Some necessary parameter tuning and ablation studies are welcome for us to understand why you have or you do not have good results.
- (f) We have 6 pts for the discussion part and 4 pts for the model performance part.
- (g) A little delay in your submission can be accepted, but weekly update shall receive extra bonus.

Please submit **one PDF report** and **one separate ZIP file** containing the code for the three GAN models you implemented.