

DS-265 DLCV 2025: Assignment 3

Deadline: 4th April, 23:59

Instructions

1. Your submission should be a zip file containing the codes (.py or .ipynb), readme.txt file, and a report in pdf format (4–5 pages, add appendix only if absolutely needed).
2. Please include comments in your code. The readme.txt file should contain information on the organization of your files, packages used along with their versions, python version, and instructions on running the code.
3. While you are encouraged to go through online repositories to learn best practices and tricks, avoid directly copying from somewhere (the code will be checked for plagiarism).
4. Please submit a report on your observations, results, plots, and analysis in PDF format. This assignment carries 30% weightage for code and 70% weightage for your analysis in the report.

[Generative Adversarial Networks, GANs]

In this question, you will implement a GAN model to perform unsupervised learning, using PyTorch.

- a) Implement a basic version of the DC-GAN (Deep-Convolutional GAN, [paper link](#)). It involves using a *fully-convolutional network* as a generator, one of the first attempts in successfully using a ConvNet to train a GAN. Please check out the details in the paper.
- b) **[Experiment 1]** Train this GAN model on the **CIFAR-10 dataset**. Plot the loss curves for both the Generator and Discriminator.
- c) **[Experiment 2]** Plot a 10 x 10 grid of images generated by the trained model. Provide your observations on the generated images (are they diverse enough, is the model able to generate successfully for all the classes, etc.).
- d) **[Experiment 3]** Vary the number of times the generator and the discriminator are trained, and document the changes in the training dynamics & behavior (how does the loss look for both, what complexities arise for different training setups), and the outputs (how does the generated images look now).
- e) **[Experiment 4]** Compute FID ([wiki](#)) between 1000 real and generated images. Document FID variation for experiment 3 above to quantify the generation quality.
- f) **[Experiment 5]** Plot generated images obtained via linear interpolation between a pair of latent vectors (refer to the section “*Walking the Latent Space*” in the paper). Report your observations on this interpolation exercise.

Create a detailed report of all the experiments and analyses (preferably in LaTeX).