Machine Learning Laboratory

Session 6 – Generative Adversarial Networks

Preparation

In this session, you will learn how generative adversarial networks work and how they are implemented.
Preparation consists of the following tasks:

- Read and understand the following literatures:
  - Goodfellow et al., "Generative Adversarial Networks" [Paper Link]
  - Radford et al. "Unsupervised representation learning with deep convolutional neural networks" [Paper Link]
- Based on this literature you should have an understanding of
  - What is a generative adversarial network (GAN)?
  - What is the function of the Generator and Discriminator, respectively?
  - How are GANs trained?
  - How many networks are trained?
  - What is the training objective?
  - What is the difference between a GAN and a DCGAN?

Further Reading

Optional: For further understanding and deeper knowledge the following (advanced) papers on adversarial networks might be interesting:

- Salimans et al., "Improved Techniques for Training GANs" [Paper Link]
- Arjovsky et al., "Wasserstein GAN" [Paper Link]
- Isola et al., "Image-to-Image Translation with Conditional Adversarial Networks" [Paper Link]
- Zhu et al., "Unpaired Image-to-Image Translation using Cycle-Consistent Adversarial Networks" [Paper Link]
- Karras et al., "A Style-Based Generator Architecture for Generative Adversarial Networks" [Paper Link]