CAP 6610, Machine Learning, Fall 2020

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Project Report 1

Project Objective: To do a comparative analysis of the performance of Generative Adversarial Network (GAN) vs Variational Autoencoder (VAE).
GAN is composed to two neural networks. Generator and Discriminator. Generator's task is to create fake images and pass it to discriminator. Discriminator distinguishes between fake and real images and provides feedback to generator.
VAE or Variational auto-encoders consists of an encoder, a decoder and a loss function. A variational autoencoder can be defined as being an autoencoder whose training is regularized to prevent overfitting and ensure that the latent space enables generative process.

About Dataset: To do the comparative analysis of Generative Adversarial Network (GAN) vs Variational Autoencoder (VAE) I intend to use MNIST handwriting Data set mentioned at http://yann.lecun.com/exdb/mnist/. The dataset contains 60,000 training images and 10,000 test images. The dataset is of 21.00 MB. If time persists, I would like to use the celeb Face dataset with over 200 thousand images located https://www.kaggle.com/jessicali9530/celeba-dataset.

Programming Environment: To develop the Generative Adversarial Network and Variational Autoencoder, I will be using Python as my primary development programming Language. I will be using Tensorflow and or Keras for creating and training my model. It is one of the more famous libraries when it comes to dealing with Deep Neural Networks.

Computational Resources: I will be using my local machine for training the model. If the train time is considerably high, I would use AWS instances with dedicated GPU servers since they are easy to set up and I have prior knowledge. AWS offers Free tier for University student just like other cloud platforms which would make sure no money is being charged.