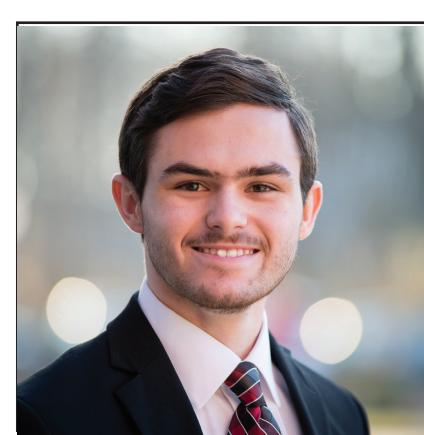


# Generative Adversarial Networks

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## Objective:

To research and design a functional Generative Adversarial Network, and use it to generate pictures of animals similar to the efficacy of existing GANs like [thispersondoesnotexist.com](http://thispersondoesnotexist.com).

Once created, experiment with the input data and neural network to see how it affects the resulting data.

## Process:

**## This will be filled out as we near completion of our project**

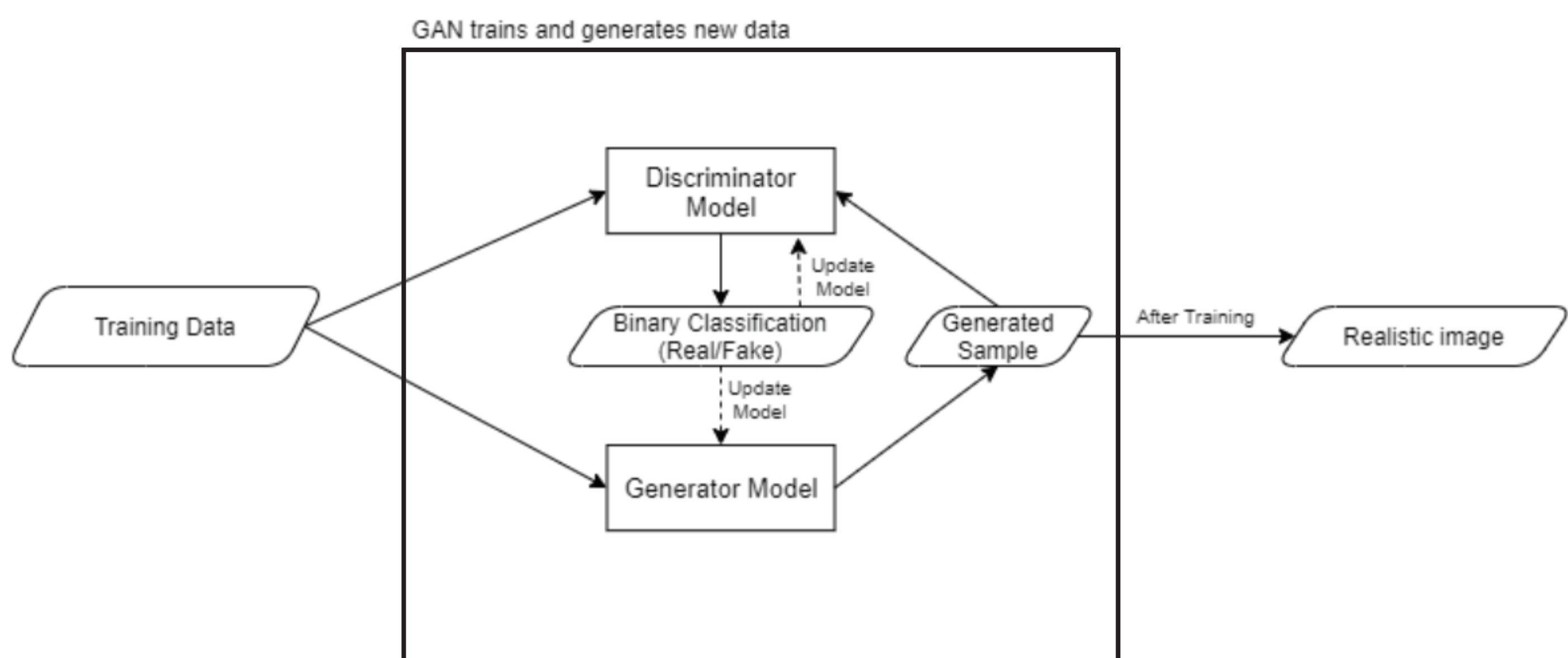
## Outcomes:

Our final product is based on an MNIST GAN modified to train on a publicly available dataset of cat faces.

**## This will be filled out as we near completion of our project**

## Design:

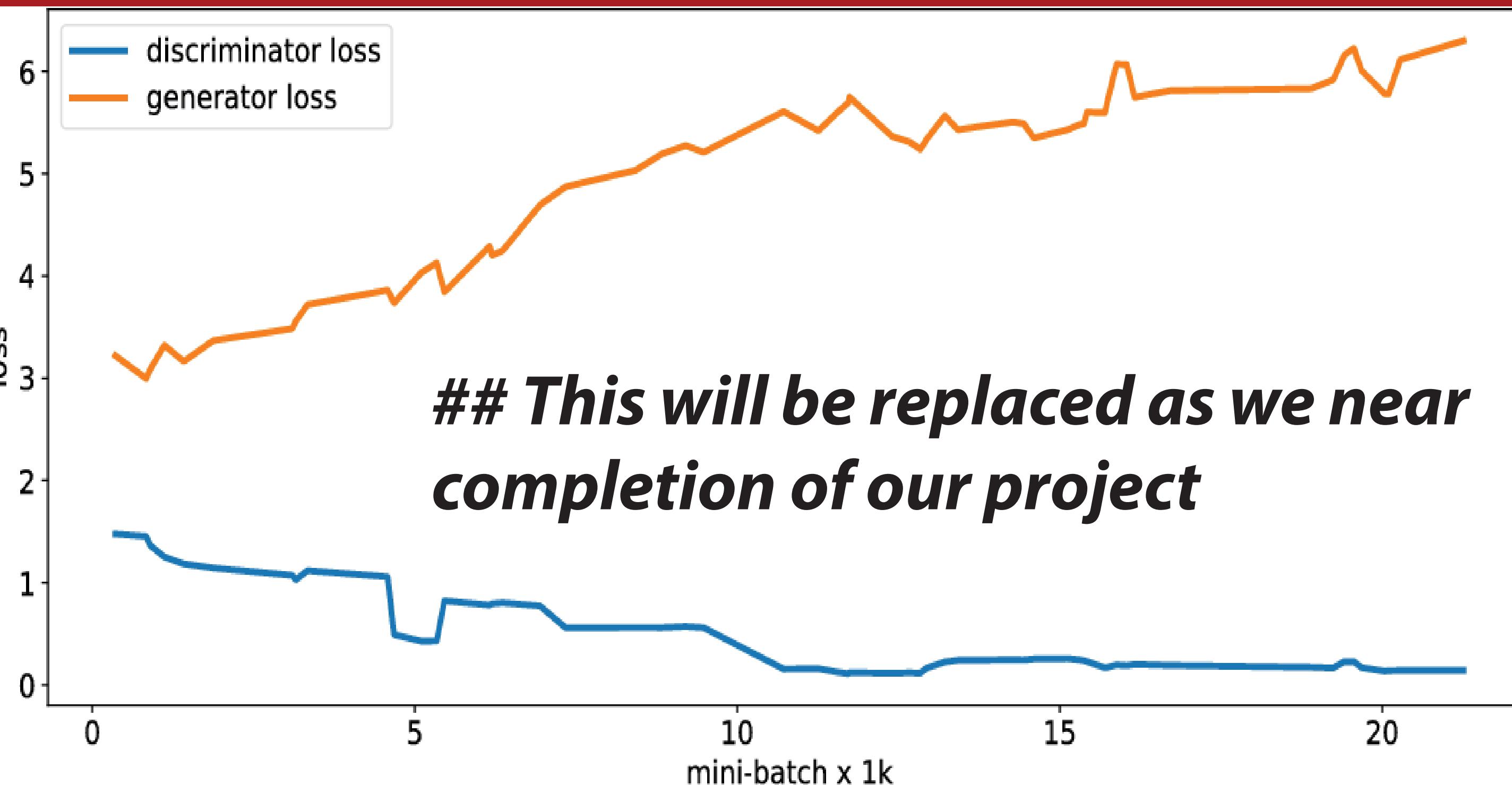
A GAN is an unsupervised neural network composed of a generator and discriminator. The former seeks out patterns in the input to create new data elements, while the latter accepts or rejects these elements based on past experience. These models improve each other in a zero-sum game until the discriminator can only guess.



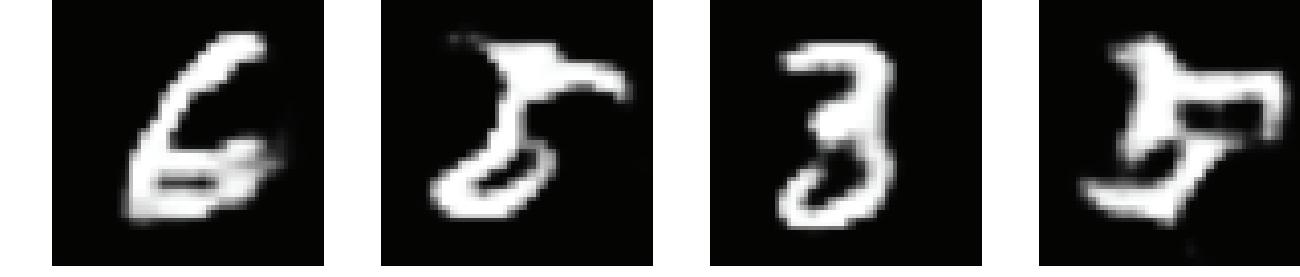
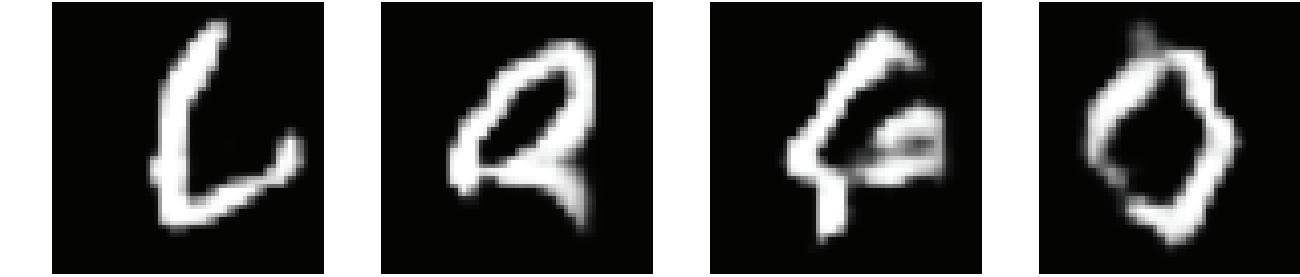
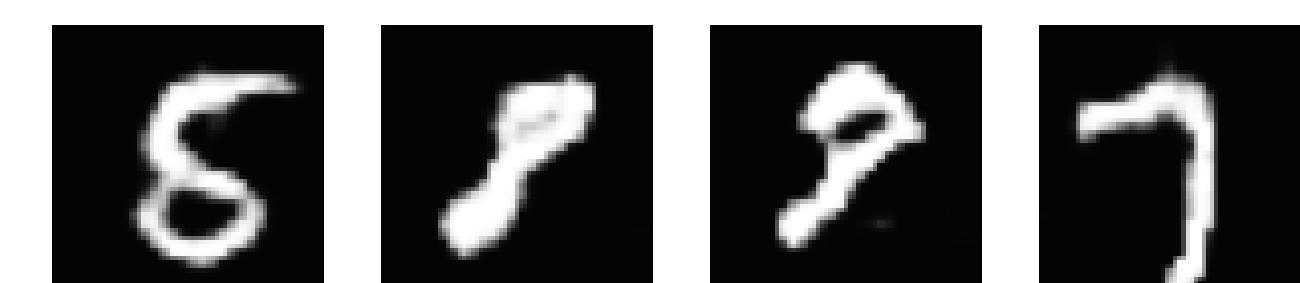
**## This will be filled out as we near completion of our project**

## Challenges:

- Computational Intensity - Needed to utilize the Ohio Super Computer (OSC)
- Technical Experience - Limited exposure to neural networks and machine learning
- Project Scope - Project objectives shifted as research into GANs was carried out
- Limited Data - Overestimated number of large, publicly available datasets



**## This will be replaced as we near completion of our project**



## References:

- <https://www.tensorflow.org/tutorials/generative/dcgan>
- <https://thispersondoesnotexist.com/>
- <https://www.kaggle.com/andrewmvd/animal-faces>
- <https://proceedings.neurips.cc/paper/2014/file/5ca3e9b122f61f8f06494c97b1afccf3-Paper.pdf>
- <https://arxiv.org/pdf/1701.07875.pdf>
- <https://machinelearningmastery.com/what-are-generative-adversarial-networks-gans/>