## **Abstract**

Deep learning has been one of the most popular topic ever since 2006 when it was first come up with. We usually apply deep learning on image recognition. This paper discussed about the mechanism of neural network and its implementation on both supervised and unsupervised learning. In the later part of my paper, I will also explain the mechanism of variational autoencoder and generative adversarial network. These two will be the tools for increasing the size of training sample in this project.