The project will mainly focus on the use of graph theory in machine learning. I will most likely focus on the applied use of the nearest neighbor’s algorithm within the KNN and k-means models and the general use of graph theory in deep learning models (as each neuron is a node, graph theory is highly applicable). I will code examples of the KNN (K-Nearest-Neighbors) and k-means models and explain when these models are appropriate to use. In order to show appropriateness on n-dimensional arrays where , I will use Principal Component Analysis (PCA) to reduce the dimensionality to .

As I have experience in applied machine learning during the past 3 years, I would like to further my knowledge on the topic and learn more about the methodology used by the models that leads to the result. I have chosen these models as I have applied them on past datasets, but never fully understood how the method got to the output.

Some sources that I may utilize are:

Graph Theory in Deep Learning: <https://towardsdatascience.com/graph-theory-and-deep-learning-know-hows-6556b0e9891b>

KNN: <https://towardsdatascience.com/machine-learning-basics-with-the-k-nearest-neighbors-algorithm-6a6e71d01761>

K-Means: <https://towardsdatascience.com/understanding-k-means-clustering-in-machine-learning-6a6e67336aa1>

PCA: <https://medium.com/@lipeng2/principal-component-analysis-a5306ee8b78>

I will also use the scikit-learn library to code KNN, k-means, and PCA.