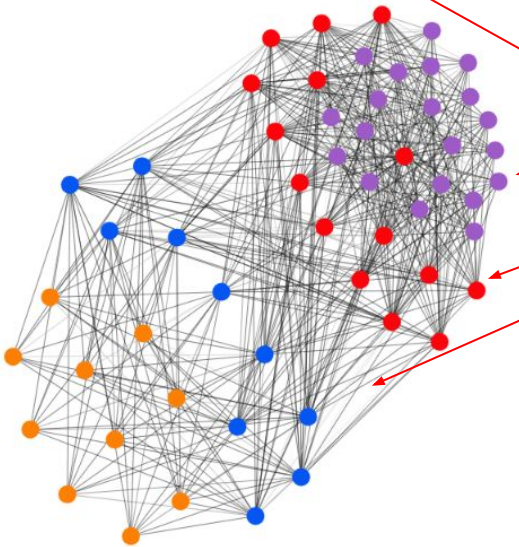
Bellow is a network visualization for a convolutional Neural Network (CNN) trained on the Fashion MNIST data set. The Fashion MNIST data set is a collection 28x28 pixel grayscale images of 10 clothing items. The graph in the lower left represents the network before any training. The graph on the right represents the network after integrating through the entire training data 200 times. The CNN is comprised of one convolutional layer and 4 fully connected layers. Only the fully connected layers are displayed.

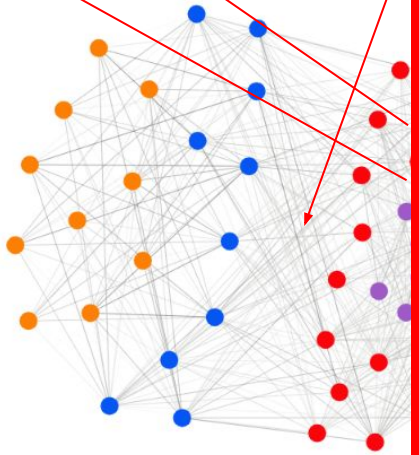
The node colors indicates the layer and the line opacity indicates the absolute value of the weight. High opacity indicates a larger value and lower opacity indicates a lower value.

Here we examine the effects of L1 regularization. L1 regularization adds the l1 norm of the network weights to the cost function. Since the network attempts to minimize the cost function, and does so by adjusting the network weights, the network should favor smaller weights as the training process progresses.

Hypothesis: L1 regularization will favor smaller weights as training progresses.

Data Source: https://github.com/DaithiMartin/data_vis_grad_project/blob/master/NN_data.json





Truthful: Data source cited and created by author. Original files and network architecture included in repository. Data is rendered from .json file directly in repository.

Functional: The node colors clearly indicate what layer each node belongs to. The network wight is represented by edge opacity. I removed drag functionality because it sent the networks off canvas but would have liked to keep that in. D3 hosted via github.io is awesome!

Enlightening: The hypothesis is effectively demonstrated with the edge opacity.

Insightful: The description of what L1 normalization is as well as the visualization of edge weight opacity is insightful.

Beautiful: I like the clean aesthetic of it. I tried many different color pallets and while more “artistic”, they obscured how effectively the hypothesis is communicated.