

# Deep Learning Visualization of Distributed Model Learning

## Background:

Deep Neural Networks demonstrates great results in the field of image classification and image recognition. However, it is very difficult to manipulate these model as they are complex non-linear multi-layer structure. As there is an intense need to understand what is going on in these networks so visualization of neural network introduced.

## Motivation:

In Deep neural network; the network composed of number of layers. These layers are made up of node where actual computation take place. These nodes combine the input with the weights which helps model to learn. To identify the activation of nodes, visualization is used. Tensor flow is a highly computational graph-based library which implements neural network with parallelization. Tesorflow provides Tensorboard for visualization but it is not very deep to understand the network carefully to minimize the error rate.

## Implementation:

Initially, we implemented the visualization of activation of Convolutional neural network on MNIST dataset which is hand written images of digits.

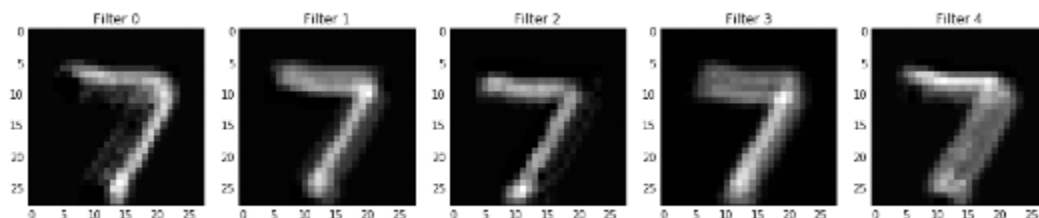


Figure1

Figure 1 shows the results of the experiment which shows how image activates neuron of convolutional neural network layers. Here the filter has learned to activate different features of image.

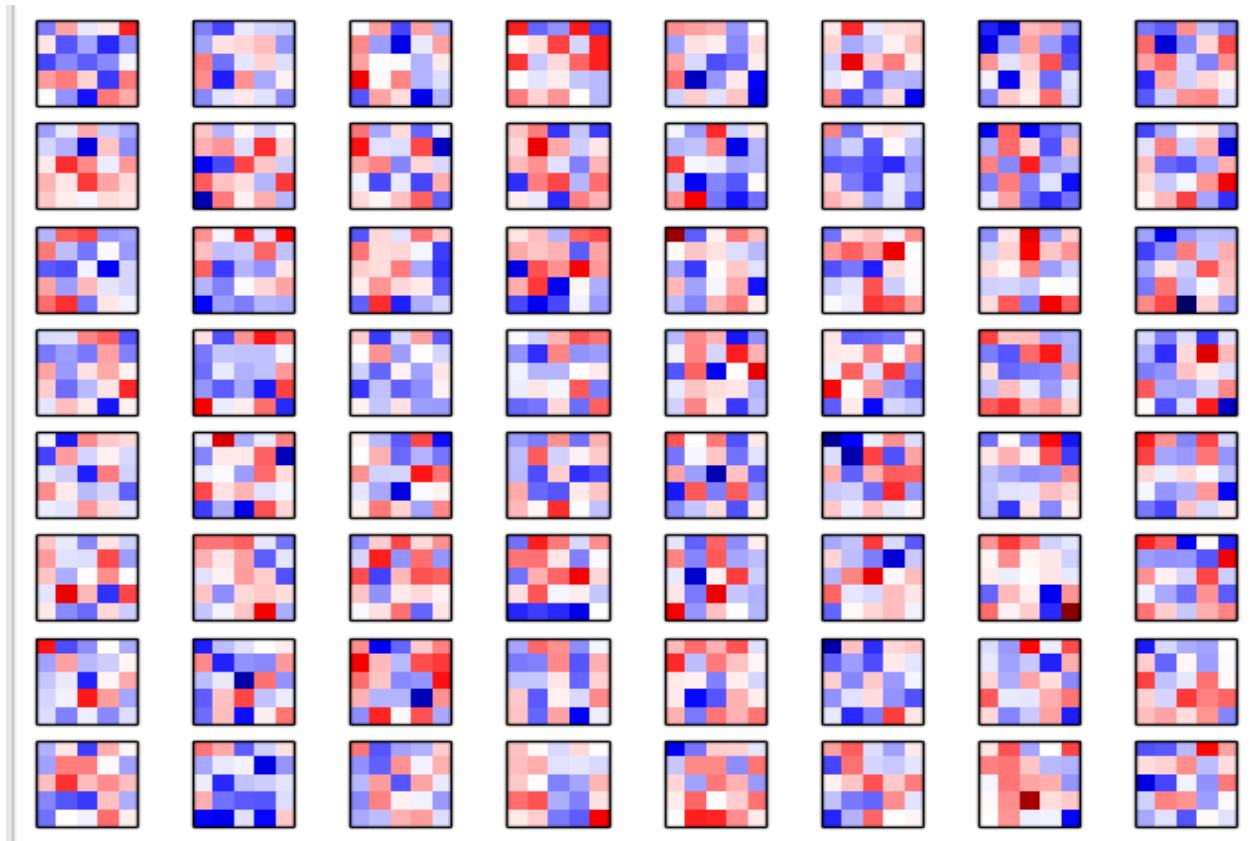


Figure 2

The following figure shows the weights one model learned for each of these classes. Red represents negative weights, while blue represents positive weights.

Currently, we are visualizing the model built for small set of heterogenous categories which can be combined to the input to the next layer of model.

### **Expected Outcome:**

Better visualization in order to manipulate model and give insights of neural network when applied to image data