

# Project: Deep Learning

## Introduction

This report provides detail of the implementation for "follow me" project which trains a deep neural network to identify and track a target in simulation.

## Network architecture

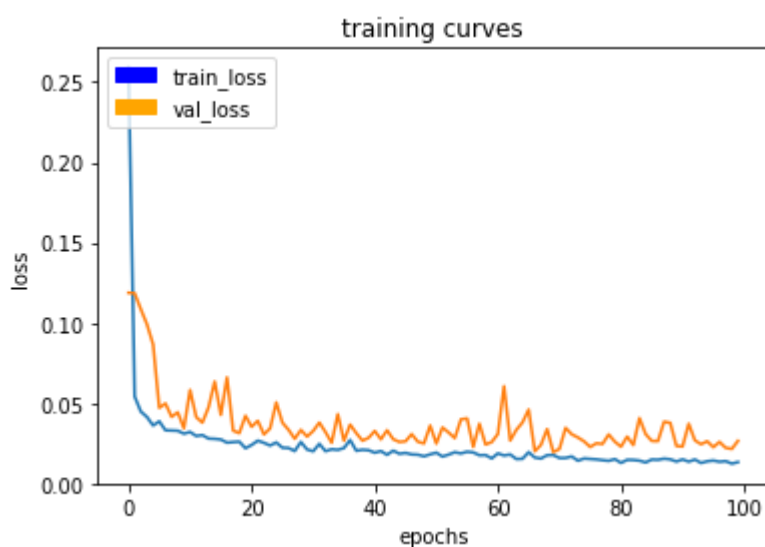
So far, the fully connected layers, which is good at tasks of image classification, can only tell what/who is inside the frame. This project applies fully convolutional network to tell the location of the object in the frame. There are 2 stages of the network: (1) encoder, and (2) decoder. Those 2 stages are connected by 1x1 convolutional layer.

## Training and Experimenting

I ended up to use these hyper-parameters. It gives the final IOU about 0.44 with the run-time on GPU about 1 hour.

learning\_rate = 0.005 batch\_size = 32 num\_epochs = 100 steps\_per\_epoch = 100  
validation\_steps = 50 workers = 4

The picture below is the final loss after 100 epochs.



## Results and Conclusion

I did not have a chance to capture extra data. Testing with the sample data produce the expected  $\sim 0.4$  IOU. I think the model is good to identify and track the object.