# Q1 Neuron and Back Propagation

## 1,2,3.

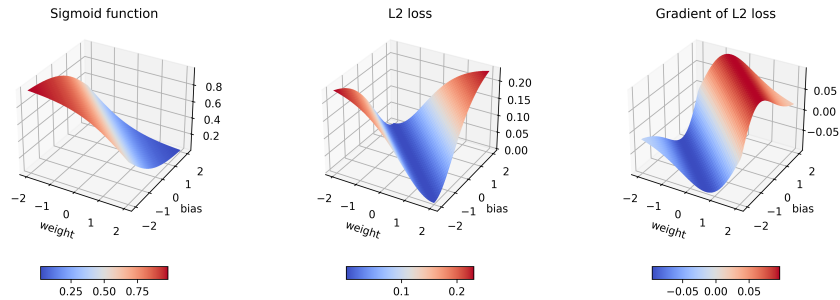The picture for this section is shown in the Fig. 1



Figure 1: Sigmoid with L2 Loss

## 4,5.

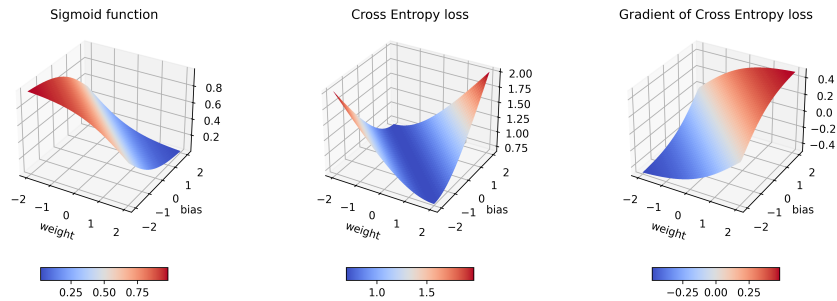The picture for this section is shown in the Fig. 2



Figure 2: Sigmoid with CrossEntropy Loss

**6.**

**a.**

We can sse from the pictures, the CrossEntropy loss changes more repidly and stably, the L2 Loss changes more smoothly.

**b.**

The gradient for CrossEntropy Loss has no local minimum and local maximum while the gradient for L2 Loss have local minimums and local maximums.

**c.**

Since the gradient of CrossEntropy Loss is more stably and monotonic, the leanring process will be faster and the loss will converge to the local minimum more rapidly than L2 Loss.

# Q2. Train a camera-only 3D object detector