Assignment 2 - CS 4375

Aadi Kothari
Andrew Su

I.   Error Log

Error (based on random_state = 5)

Learning Rate	Sigmoid	tanh	ReLu
0.1	546.0	546.0	546.0
0.01	542.5	546.0	546.0
0.001	493.0	542.5	546.0
0.0001	531.5	531.5	542.5

A learning rate of 0.001 combined with the sigmoid function produced the lowest error. ReLu performed the worst.

II.   Output

When post-processing is applied to the output, vectors of 4 floating point values are converted to directional moves. Here is a sample of the output.

Predicted Motion	Actual Motion	Predicted Vectors	Actual Vectors
Sharp-Right-Turn	Sharp-Right-Turn	[0. 0. 0.013 1.]	[0. 0. 0. 1.]
Move-Forward	Move-Forward	[1. 0. 0.005 0.]	[1. 0. 0. 0.]
Move-Forward	Move-Forward	[0.955 0. 0.002 0.029]	[1. 0. 0. 0.]
Move-Forward	Move-Forward	[1. 0. 0. 0.]	[1. 0. 0. 0.]
Sharp-Right-Turn	Sharp-Right-Turn	[0.051 0. 0. 0.971]	[0. 0. 0. 1.]
Sharp-Right-Turn	Sharp-Right-Turn	[0. 0. 0. 1.]	[0. 0. 0. 1.]
Sharp-Right-Turn	Sharp-Right-Turn	[0. 0. 0. 1.]	[0. 0. 0. 1.]
Slight-Left-Turn	Slight-Left-Turn	[0.013 0. 0.979 0.]	[0. 0. 1. 0.]
Sharp-Right-Turn	Sharp-Right-Turn	[0. 0. 0. 0.995]	[0. 0. 0. 1.]
Sharp-Right-Turn	Sharp-Right-Turn	[0. 0. 0. 1.]	[0. 0. 0. 1.]
Slight-Right-Turn	Slight-Right-Turn	[0.001 0.999 0. 0.]	[0. 1. 0. 0.]
Move-Forward	Move-Forward	[1. 0. 0. 0.]	[1. 0. 0. 0.]

This shows that the error calculated by summing floating point values in the vector (i.e. [0.013, 0, 0.979, 0] vs [0, 0, 1, 0] is negligible since the direction can be accurately determined.