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CprE 482x

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Bounty Points Report

Project:

For my bounty points, I implemented a visualizer for neural network inference and backpropagation in unity, building it for the universal target of WebGL. This tool is intended to help future students visualize and interact with a neural network in real-time and understand how error is propagated through the networks.

I chose this project because, until about a week ago, I did not understand backpropagation. Looking back now, after learning it for this project, it is extremely simple, and I hope this program (and its future iterations) can help students understand it earlier.

GitHub Repository:

https://github.com/Ruchotzke/DNN-Visualizer

Technical Specification:

Engine: *Unity 2021.2.6f1 (Downloaded from Unity Hub https://unity.com/download)*

Modules Used: *WebGL Build*

Build and Run Instructions:

Build and run instructions are included in the git repository in the README. It is an md file, so please open it with something other than a text editor for the full experience (or read it in github itself).

Instructions for Use:

Also located in the README.

Final Comments:

This has been a fun project, and a fun way to learn backpropagation. The network implemented now learns to sum two input values (which was neat to see), but for a future version, I'd like to implement a network which categorizes color. Now that I finally understand backpropagation, I can really extend this project further. There is also a feature backlog in the README I hope to get implemented sometime soon, perhaps over winter break.

Finally, I will most likely (~90% sure) be sticking around another few years to do a doctorate, so if this was interesting to you, I would be happy to keep extending it and adding more features, or possibly new visualizations.