NeuralVis Quiz

Welcome to the assessment part of the NeuralVis thesis! This form simply aims to acquire data for an empirical evaluation of NeuralVis' suitability as a learning tool for Neural Networks.

What is your age? *

- [ ] 18 years or below
- [ ] 18-24
- [x] 24+

Gender: How do you identify? (choose 'other' if you prefer to self-describe) *

- (•) Male
- ( ) Female
- ( ) Non-binary
- ( ) Prefer not to answer
- ( ) Sonstiges: _____

What is the highest degree or level of school you have completed? *

- [ ] No schooling completed
- [ ] High school graduate
- [x] Bachelor's degree
- [ ] Master's degree
- [ ] Professional or doctorate degree
- [ ] Sonstiges: .....

Do you have a degree in STEM? (science, technology, engineering and mathematics) *

- (•) Yes
- ( ) No

On a scale from 1 to 5, how would you rate your prior knowledge of AI and Artificial Neural Networks (ANNs)? *

	1	2	3	4	5	
Highly knowledgeable	○	○	○	◉	○	Layman's level

If applicable, where did you learn about AI and ANNs?

- [x] Undergraduate education
- [x] Graduate education
- [ ] Self taught (online resources, textbook studies)
- [ ] Sonstiges: .....

Before starting with the questions, what material in preparation of this quiz did you use as part of the NeuralVis thesis? *

- ( ) The provided introductory text to Neural Networks
- (•) The NeuralVis 3D visualization

How long did you prepare with the provided material? *

10min

If applicable, how long did you spend interacting with the NeuralVis visualizations?

Quiz section. At least 1 answer is correct, depending on how the question is phrased.

What is the primary function of a neural network? *

- [ ] To generate rule-based patterns
- [x] To recognize patterns based on data
- [ ] To store data in an efficient structure
- [ ] To increase speed of certain computations

How does a neural network learn? *

- [ ] By memorizing the input data
- [ ] By randomly changing the neuron's parameters
- [ ] By looking up optimal parameters in a database
- [x] By adjusting its parameters based on the prediction errors

What is the purpose of the output layer in a neural network? *

- [ ] To randomly initialize weights and biases
- [ ] To serve as an interface for the input data
- [x] To provide the prediction results in an interpretable way
- [ ] To optimize the storage of data

What is the role of an activation function in a neuron? *

- [ ] To limit the output to a specific range
- [x] To randomly adjust the neuron's weights
- [ ] To increase the neuron's speed
- [ ] To directly predict the output

How are the neurons in a neural network structured? *

- [ ] Randomly without a specific order
- [ ] Hierarchical based on their activation values
- [ ] Based on the size of the input data
- [x] In layers that are interconnected

What is the purpose of the input layer in a neural network? *

- [ ] To randomly initialize weights and biases
- [ ] To normalize the input data for further operations
- [x] To serve as an interface for the input data
- [ ] To serve as a control element for the neural network's parameters

What signifies the start of backward propagation? *

- [ ] The input of new data samples
- [ ] The calculation of errors from the current prediction
- [x] The final output of the activation functions
- [ ] The initialization of the weights and biases

What is the purpose of forward propagation? *

- [ ] To adjusts the weights and biases based on the prediction error
- [ ] To randomize the network's parameters for better predictions
- [ ] To stores the input data for future reference
- [x] To calculate the network's output for a given input

What are the characteristics of the MNIST dataset? *

- [ ] It includes tens of thousands of handwritten digits
- [ ] It consists of high-resolution color images of various objects
- [x] It contains images represented as 28x28 grayscale values
- [ ] It contains audio recordings of loudly and clearly spoken digits

What is the purpose of backward propagation? *

- [ ] To input new data samples into the neural network
- [ ] To call the neuron's activation functions
- [x] To adjust the weights and biases based on the prediction error
- [ ] To propagate the input back towards the output layer

How many neurons are present in the input layer? *

- [ ] None, the input layer is the only layer without neurons
- [x] As many as there are features in the data samples
- [ ] As many as the network designer chooses as a hyperparameter
- [ ] Any number that is a power of 2

What are components of a single neuron? *

- [x] Weights
- [ ] Input Filter
- [ ] Bias
- [x] Activation Function

Which types of layers are present in a neural network? *

- [x] Output Layer
- [ ] Activation Layer
- [x] Input Layer
- [x] Hidden Layer

How many neurons are present in a hidden layer? *

- [x] As many as the network designer chooses as a hyperparameter
- [ ] At least as many as in the previous layer
- [ ] 2^n where n is the index of the current hidden layer
- [ ] None, as hidden layers don't have any neurons

What inspired the design of a neural network? *

- [ ] A web of silk strings made by a spider
- [ ] Traffic behaviour in a vast network of city streets
- [x] The connections in the human brain
- [ ] The communication of satellites in orbit

How many neurons are present in the output layer? *

- [ ] As many as the network designer chooses as a hyperparameter
- [x] As many as there are prediction targets
- [ ] Always 10 in any network setup
- [ ] None, as the output only contains the prediction value