Instructions & Screenshots of Sigmoid Application

1. App Interface and Initial Configuration

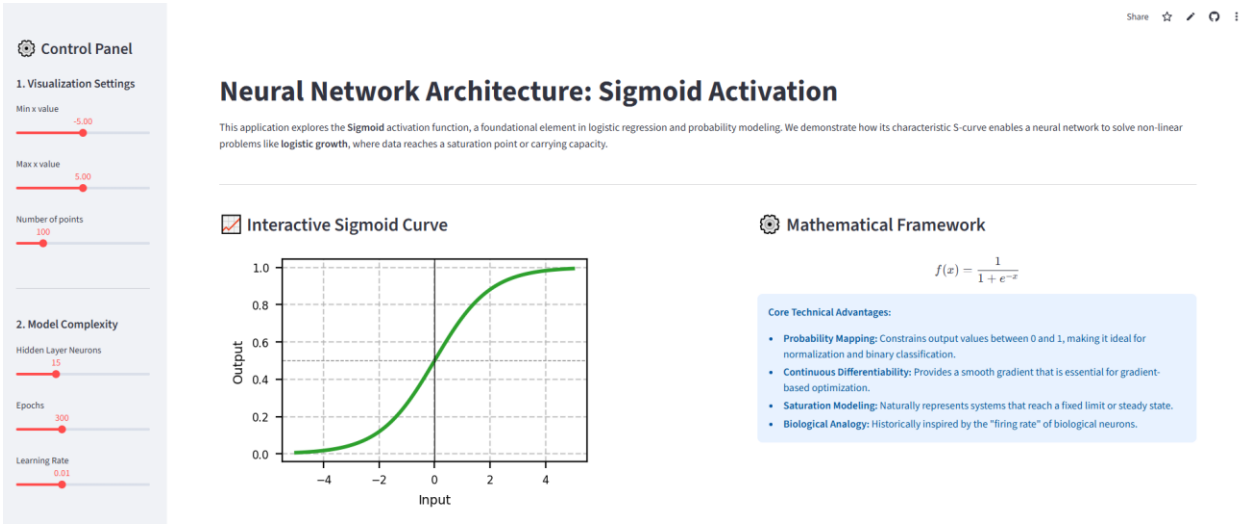

Figure 1

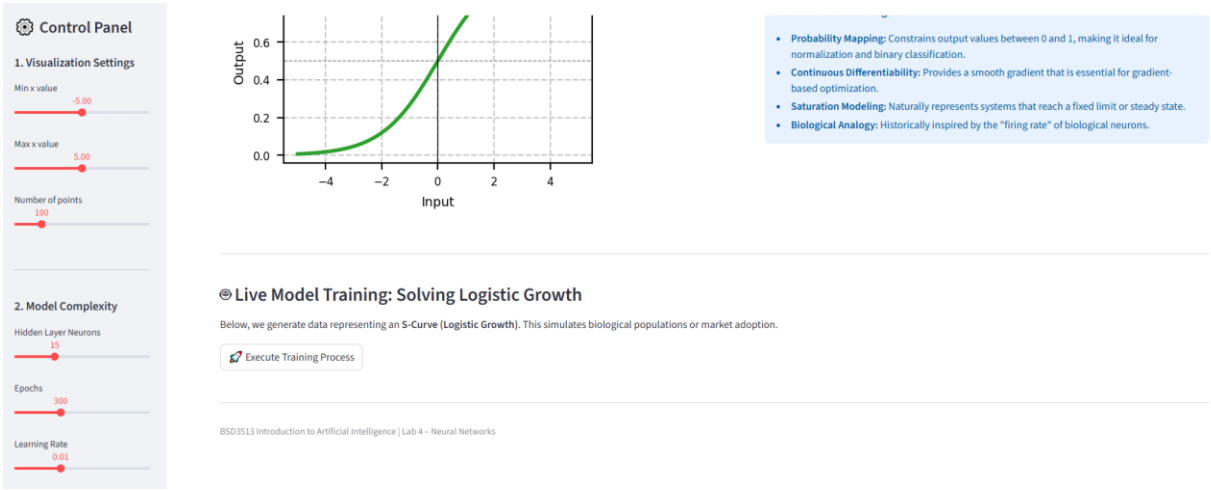

Figure 2

Figure 1 and Figure 2 show screenshots of the application immediately after it loads. The interface is designed as a comprehensive dashboard for exploring neural network components, including:

Sidebar Control Panel	A dedicated section for configuring visualization parameters (input range and number of data points) and neural network hyperparameters, specifically hidden layer neurons, epochs, and the learning rate.
Main Header	A primary title accompanied by a concise technical description that introduces the role of the Sigmoid activation function in modeling bounded non-linear growth within neural network models.
Interactive Sigmoid Curve	Located in the first section, this visualization is dynamically updated in real-time according to the user's selections. It allows for an immediate visual understanding of the function's S-shaped curvature and its ability to map inputs to a [0, 1] probability range.
Mathematical Framework	Positioned beside the curve, this component provides a mathematical and conceptual explanation of the Sigmoid algorithm, highlighting its advantages in probability mapping and continuous differentiability for smooth optimization.
Live Training Module	The second section of the app focuses on utilizing a Multi-Layer Perceptron (MLP) neural network to solve a non-linear regression problem. Initially, this section displays the raw "S-Curve" (Logistic Growth) dataset without the neural network's prediction output.
Execution Training Process Button	A "Execute Training Process" button is provided, which the user can click after finalizing parameters to initiate the backpropagation and neural network optimization loop.

2. App Interface Post-Training Execution

Figure 3 shows the screenshot of the app right after the user clicks “Execute Training Process” and the optimization loop completes.

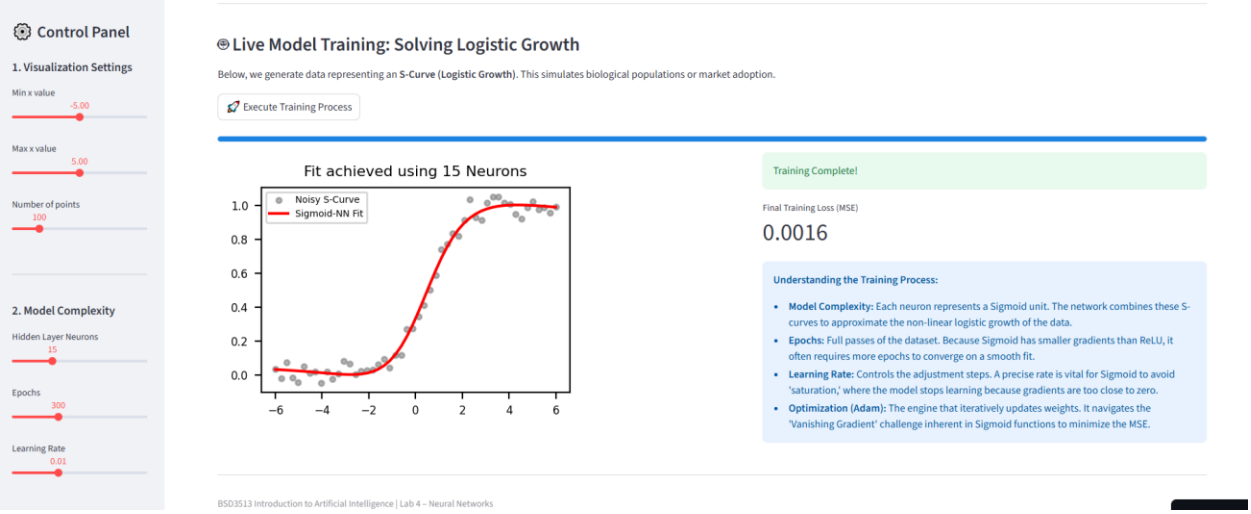

Figure 3

The interface dynamically updates to present the following results:

Neural Network Regression Plot	The main visualization area now displays a red “NN Prediction” line overlaid on the original “S-Curve” (Logistic Growth) data points. This line demonstrates how the neural network has successfully utilized the Sigmoid activation functions to create a smooth, bounded transition that approximates the non-linear distribution of the dataset. The plot title reflects the specific neural network complexity used (e.g., “Fit achieved using 15 Neurons”), confirming that the model adapted its internal architecture based on the user’s sidebar selections.
Training Status and Metrics	A green “Training Complete!” status message appears, accompanied by a professional metric displaying the Final Training Loss (MSE). This numerical value (e.g., 0.0016) provides objective proof of the neural network’s accuracy in minimizing the error between its logistic predictions and the noisy data points during the training rounds.

Understanding the Training Process	Positioned to the right of the results, the info box is available so users can refer to the definitions of Epochs, Optimization (Adam), Learning Rate, Loss (MSE), and Neural Complexity. This section specifically helps users understand how these parameters work together to overcome challenges like the vanishing gradient to achieve a successful fit.