

Instructions & Screenshots of Tanh Application

1. App Interface and Initial Configuration

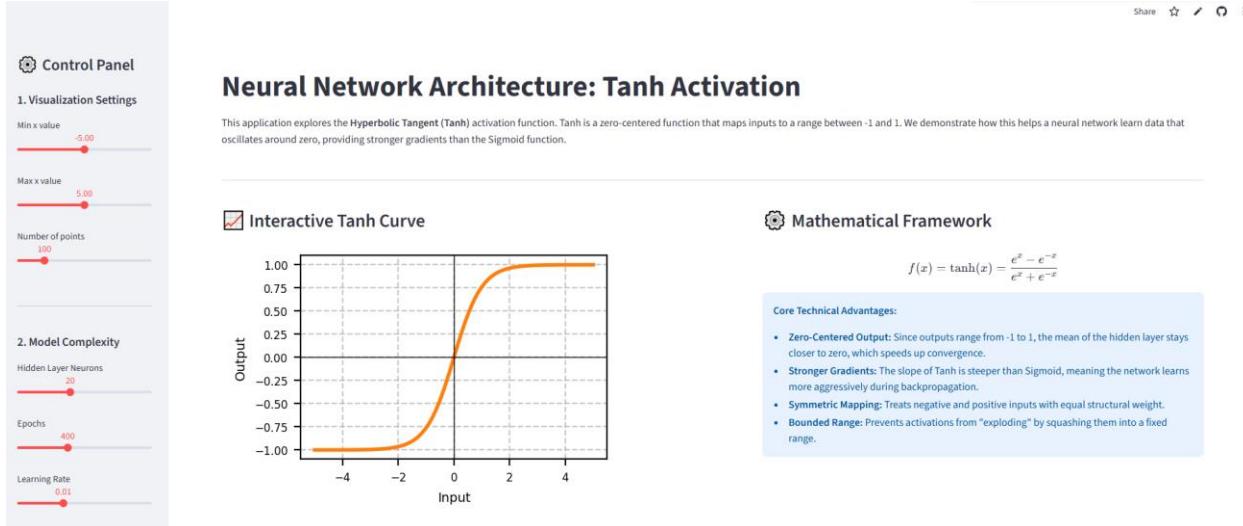


Figure 1

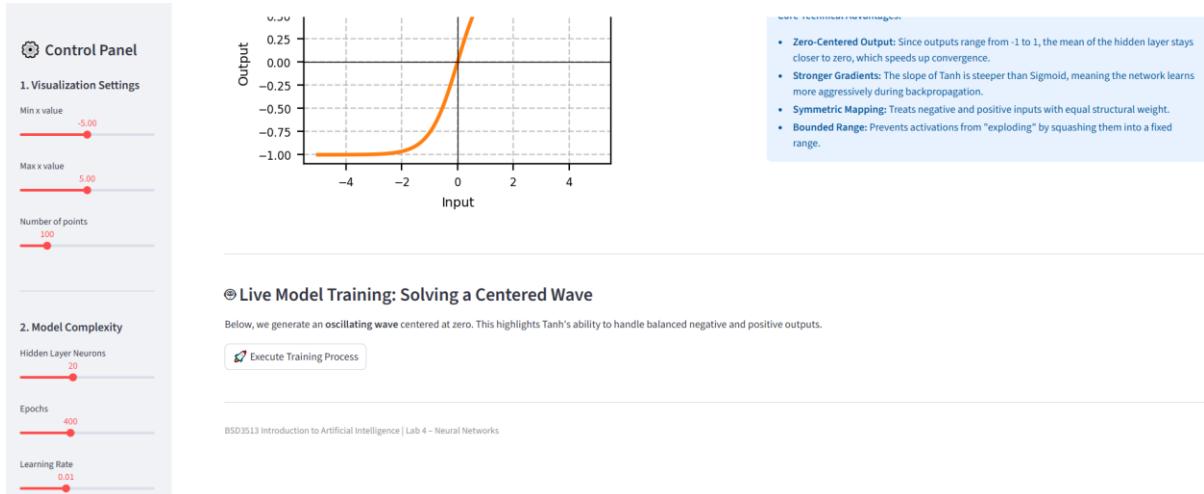


Figure 2

Figure 1 and Figure 2 show screenshots of the application immediately after it loads. The interface is designed as a comprehensive dashboard for exploring Tanh activation function, featuring:

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	Introduces the Hyperbolic Tangent (Tanh) function, explaining its role in providing zero-centered data mapping within a neural network.
Interactive Tanh Curve	A dynamic visualization in the first section that updates in real-time. It demonstrates the function's ability to “squash” inputs into a symmetric range between -1 and 1.
Mathematical Framework	Positioned beside the curve, this component provides a mathematical and conceptual explanation of the Tanh algorithm, highlighting its zero-centered advantage and stronger gradients compared to the Sigmoid function.
Live Training Module	The second section features a Multi-Layer Perceptron (MLP) neural network designed to solve a regression problem. Initially, it shows a Centered Wave (Oscillating) dataset which highlights Tanh’s effectiveness in handling negative and positive target values simultaneously.
Execution Training Process Button	A button 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.

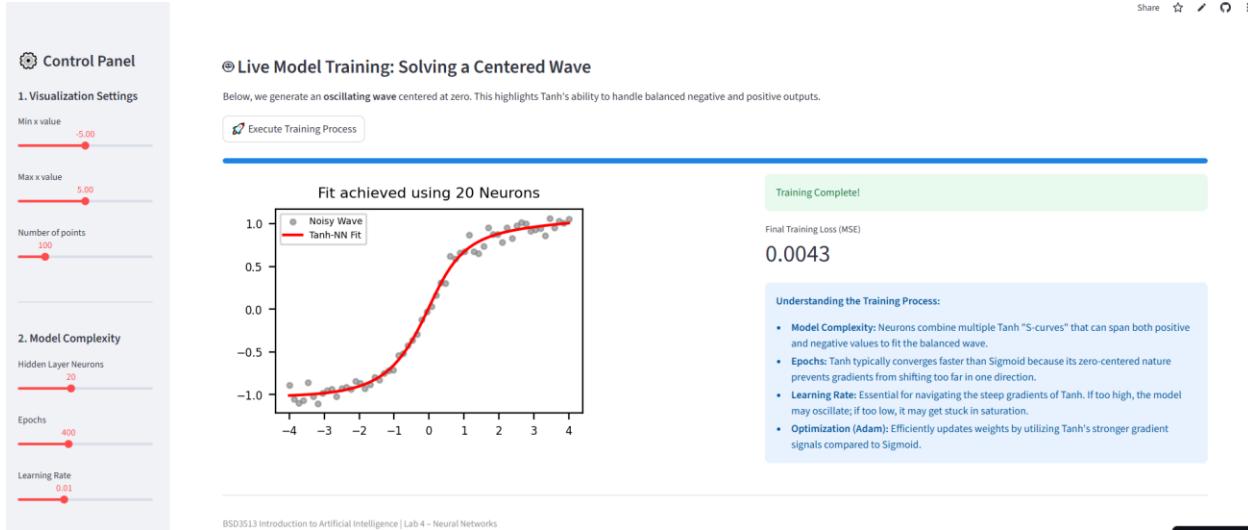


Figure 3

The interface presents the following results:

Neural Network Regression Plot	The visualization displays a red “NN Prediction” line successfully fitting the Centered Wave data. This demonstrates how the network utilizes the symmetric Tanh activation to model data that oscillates around the zero-axis. The title reflects the neural network complexity (e.g., 20 Neurons) used to achieve the fit.
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., 0.0043) provides empirical evidence of the model’s convergence and accuracy.
Understanding the Training Process	The final info box provides a synthesis of the training mechanics. It explains how Model Complexity and Optimization (Adam) work in tandem with Tanh’s steep gradients to achieve faster convergence than traditional Sigmoid-based models.