Predicting Student Success with Neural Networks

Using Python, TensorFlow, and machine learning.

Project Overview

Objective

Predict student success with machine learning.

Dataset

Student information like study hours, attendance, and grades.

Model Used

Deep Neural Network (DNN) for binary classification.

Data Preprocessing

Missing Data

Drop missing values.

Data Mapping

Transform categorical features into numerical values.

Scaling

Normalize features to a common scale.

Feature Selection and Scaling

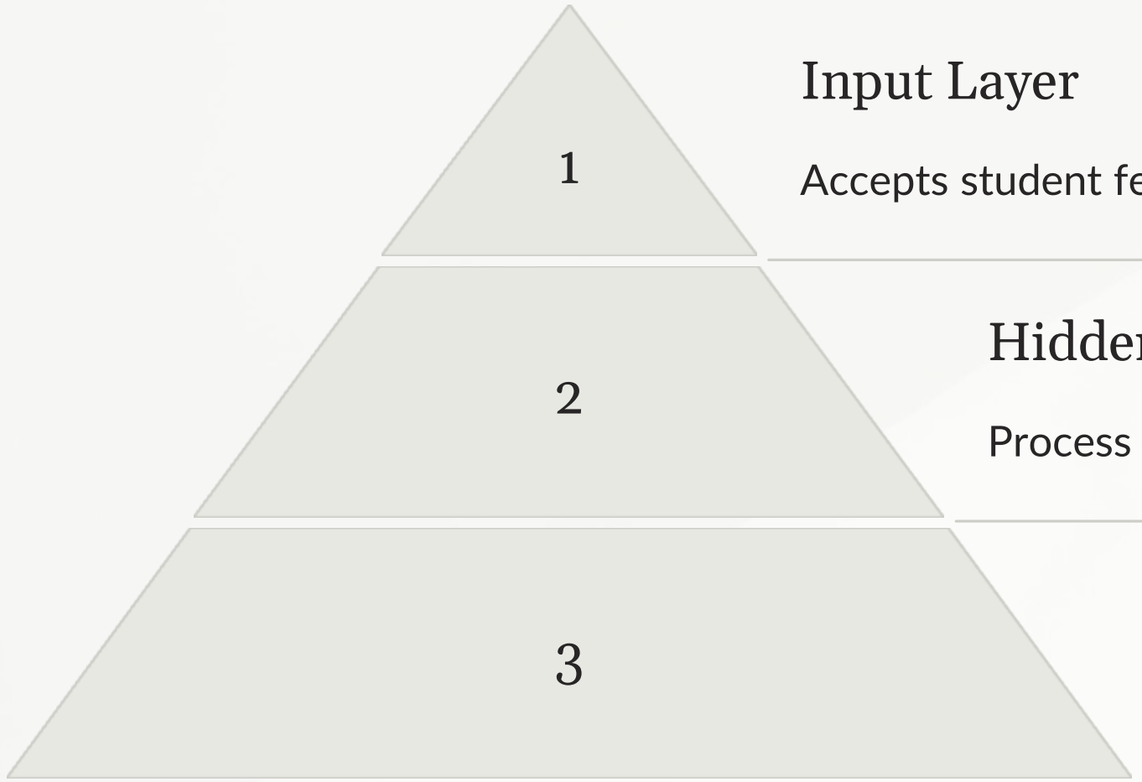
Selected Features

Most relevant factors for predicting success.

Scaling

Prepares data for model training.

Model Architecture



Input Layer

Accepts student features.

Hidden Layers

Process data, extract patterns.

Output Layer

Predicts success probability.

Model Compilation

1

Optimizer

Adam algorithm.

2

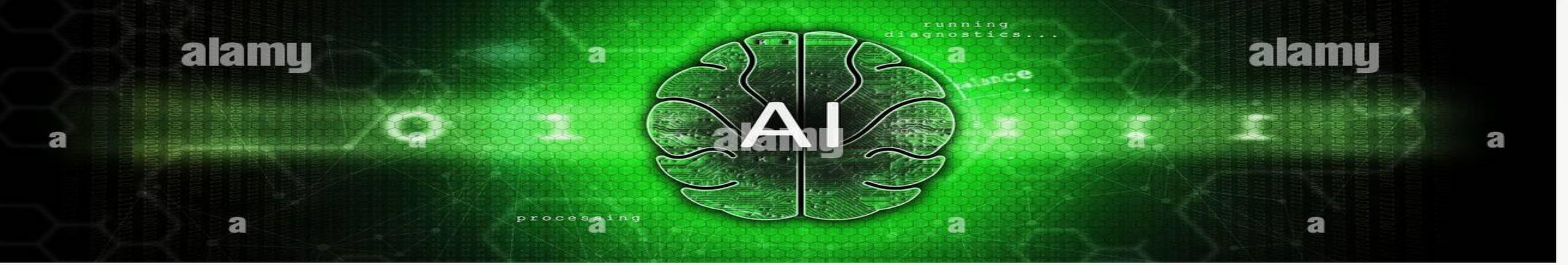
Loss Function

Measures model error.

3

Metrics

Evaluates model performance.



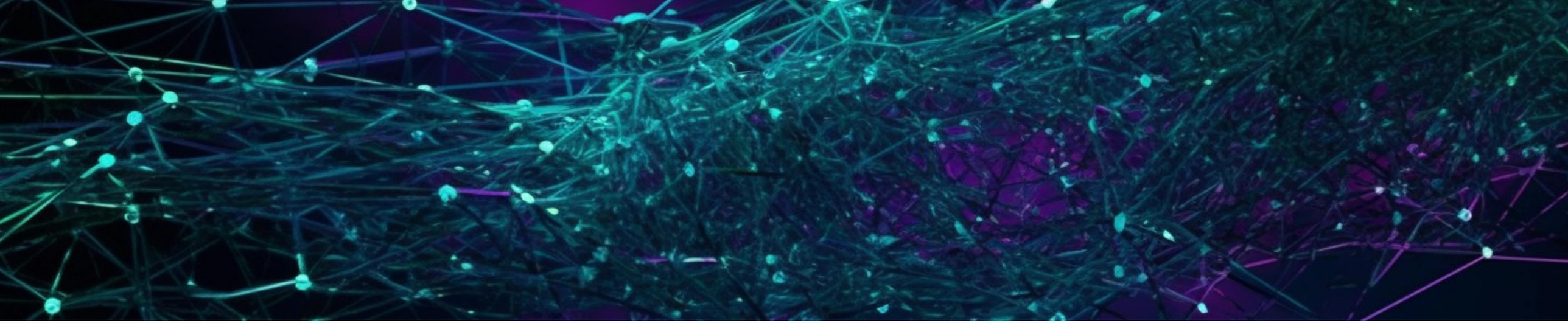
Training the Model

Training Data Split

80% for training, 20% for testing.

Custom Callback

LivePlot visualizes accuracy and loss during training.



Visualizing Training Process

LivePlot Callback

Visualize training progress.

1

Real-time Plots

Display accuracy and loss.

2

Monitor Learning

Understand model performance.

3

Model Evaluation

85%

Training Accuracy

Evaluates model on training data.

78%

Test Accuracy

Evaluates model on unseen data.

90%

Confusion Matrix

Visualizes performance on different classes.

Conclusion and Next Steps

1

Model Performance

Accuracy achieved on training and test data.

2

Possible Improvements

More data, fine-tuning, and experimenting with different models.

3

Applications

Use in various educational settings to predict student success.