MODEL ARCHITECTURE AND CONFIGURATION

We employed a Multi-Layer Perceptron (MLP) classifier for differential diagnosis between biliary atresia and choledochal cyst. The specific model configuration is as follows.

Network architecture

Hidden layer structure: (128, 64, 32); Activation function: relu; Input features: 7; Output classes: 2; Total parameters: 11393.

Training configuration

Optimization algorithm: sgd; Initial learning rate: 0.001; Learning rate schedule: constant; Maximum iterations: 300; Actual iterations: 300; Regularization parameter (α): 0.0001; Batch size: auto; Random seed: 0.

Model performance metrics

Final training loss: 0.3196689236077049; Convergence tolerance: 0.0001; Early stopping: False.

The model was implemented using Python scikit-learn library. All hyperparameters were optimized through grid search or random search procedures. Model reproducibility was ensured by setting a fixed random seed.