Report on Neural Network Optimization for Predicting MY1 and MY2

The goal of this task was to develop a neural network using Keras to predict the variables MY1 and MY2 from the provided dataset features. The model was optimized using RandomizedSearchCV, which explored hyperparameters such as the number of neurons, dropout rate, learning rate, batch size, epochs, and optimizer type. The best-performing configuration included: optimizer = 'adam', neurons = 256, learning_rate = 0.01, epochs = 150, dropout_rate = 0.2, and batch_size = 32. The model's performance, however, remained suboptimal, with R-squared values of -0.2894 for MY1 and -0.3431 for MY2, indicating a poor fit to the test data and an inability to explain variance in the target variables. The Negative MSE score on the validation set was -171.08. Additionally, due to logging issues with the SciKeras wrapper, training history was not recorded, limiting further insights into training and validation loss trends. Future improvements will involve enhancing the dataset through feature engineering, exploring more complex architectures, and resolving logging issues to better evaluate model performance.

Since we know the best parameters after the randomCV. I used the parameters directly to fit the single model and get the loss visualization. (Easy to get the viz from single keras history).