

```
tivation': 'prelu', 'keras_clf_fit_epochs': 100, 'keras_clf_fit_batch_size': 32}
Mean Train Score: 0.828456882663104
Mean Test Score: 0.5558841971356862
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Rank 21:
Parameters: {'keras_clf_model_units2': 128, 'keras_clf_model_units': 384, 'keras_clf_model_optimizer': 'sgd', 'keras_clf_model_num_layers': 3, 'keras_clf_model_learning_rate': 0.01, 'keras_clf_model_dropout_rate': 0.0, 'keras_clf_model_activation': 'relu', 'keras_clf_fit_epochs': 100, 'keras_clf_fit_batch_size': 32}
Mean Train Score: 0.7770234685053238
Mean Test Score: 0.5325583574314017
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Best parameters found: {'keras_clf_model_units2': 64, 'keras_clf_model_units': 256, 'keras_clf_model_optimizer': 'adam', 'keras_clf_model_num_layers': 2, 'keras_clf_model_learning_rate': 0.0001, 'keras_clf_model_dropout_rate': 0.0, 'keras_clf_model_activation': 'prelu', 'keras_clf_fit_epochs': 200, 'keras_clf_fit_batch_size': 32}
Model: "sequential_150"
```

Layer (type)	Output Shape	Param #
dense_522 (Dense)	(None, 256)	476,416
p_re_lu_129 (PReLU)	(None, 256)	256
batch_normalization_372 (BatchNormalization)	(None, 256)	1,024
dense_523 (Dense)	(None, 32)	8,224
p_re_lu_130 (PReLU)	(None, 32)	32
batch_normalization_373 (BatchNormalization)	(None, 32)	128
dense_524 (Dense)	(None, 3)	99

```
Total params: 1,457,387 (5.56 MB)
Trainable params: 485,603 (1.85 MB)
Non-trainable params: 576 (2.25 KB)
Optimizer params: 971,208 (3.70 MB)
```

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None
Model saved as pipeline_nn_model.joblib
237/237 ━━━━━━━━ 0s 1ms/step
TrainVal set eval:
[[2638 259 29]
 [ 325 2050 179]
 [ 74 265 1762]]
      precision    recall  f1-score   support
          0       0.87      0.90      0.88     2926
          1       0.80      0.80      0.80     2554
          2       0.89      0.84      0.87     2101

      accuracy                           0.85     7581
     macro avg       0.85      0.85      0.85     7581
weighted avg       0.85      0.85      0.85     7581
```

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16/16 ━━━━━━━━ 0s 639us/step
Test set eval:
[[126 18 23]
 [ 95 70 74]
 [ 24 27 37]]
      precision    recall  f1-score   support
          0       0.51      0.75      0.61     167
          1       0.61      0.29      0.40     239
          2       0.28      0.42      0.33      88

      accuracy                           0.47     494
     macro avg       0.47      0.49      0.45     494
weighted avg       0.52      0.47      0.46     494
```

```
schriger2024@schrigerlab-precision-3680:~/Desktop/Baosen/s1_trainML_20250114/s2_traaaaaa
aiML/trainNN$ s
```