

COMPSCI 589 Final Project

William Cai, Maxwell Tang

9 May 2025

1 MNIST Dataset

1.1 Hyperparameter Sets

1.2 Hyperparameter Sets

2 Rice Dataset

Maxwell’s implementations were used for the entirety of this dataset. For the rice dataset, we chose

2.1 Hyperparameter Sets

Model Shape	Epoch	Accuracy
[64, 128, 10]	989	0.952145
[64, 64, 10]	977	0.933768
[64, 10]	988	0.920987
[64, 16, 10]	991	0.878687
[64, 16, 16, 10]	998	0.803554
[64, 8, 10]	997	0.722818
[64, 8, 8, 10]	999	0.533731

Table 1: The results for the hyperparameter tuning step on the MLP architecture trained on the rice dataset. The best epoch is used for each hyperparameter setting.

Minimum Splittable Size	ntree	Mean Accuracy
5	100	0.977182
10	100	0.975515
20	50	0.967722
30	100	0.954926
40	100	0.953256
50	50	0.943811
2	10	0.523063

Table 2: The results for the hyperparameter tuning step on the random forest architecture trained on the rice dataset. The best epoch is used for each hyperparameter setting.

Model Shape	Epoch	Mean Accuracy
[7, 8, 8, 1]	765	0.930971
[7, 2, 1]	979	0.929921
[7, 2, 4, 1]	996	0.929659
[7, 1]	670	0.929396
[7, 16, 16, 1]	553	0.928871
[7, 4, 16, 1]	735	0.928871
[7, 2, 16, 1]	656	0.928871
[7, 16, 1]	584	0.928871
[7, 16, 8, 1]	757	0.928084
[7, 8, 2, 1]	969	0.928084
[7, 8, 1]	535	0.928084
[7, 8, 4, 1]	638	0.928084
[7, 16, 2, 1]	760	0.927822
[7, 2, 8, 1]	960	0.927822
[7, 8, 16, 1]	748	0.927822
[7, 16, 4, 1]	732	0.927822
[7, 4, 8, 1]	835	0.927559
[7, 4, 4, 1]	993	0.927297
[7, 4, 1]	781	0.927034
[7, 4, 2, 1]	770	0.925722
[7, 2, 2, 1]	999	0.887139

Table 3: The results for the hyperparameter tuning step on the MLP architecture trained on the rice dataset. The best epoch is used for each hyperparameter setting.

Minimum Splittable Size	ntree	Mean Accuracy
30	100	0.928215
20	100	0.927979
40	100	0.927428
50	100	0.927008
10	50	0.926772
2	50	0.926772
5	50	0.926772

Table 4: The results for the hyperparameter tuning step on the Random Forest architecture trained on the rice dataset. The best ntree value is used for each hyperparameter setting.