Tuning results for the CVRP

K-nearest Neighbor (KNN)2

1. Parameter grid/distribution

- scaler: [StandardScaler(), MinMaxScaler()]
- knn__n_neighbors: [7, 8, 9, 10, 11, 12]

2. Best parameters

- scaler: StandardScaler()
- knn__n_neighbors: 12

3. Tuning details

- Search type: GridSearchCV
- Parameter combinations: 12
- Total tuning time: 54s
- Total tuning fit time: 1s
- Total tuning prediction time: 3m, 2s

Polynomial Regression

1. Parameter grid/distribution

- feature_set: ['top20_features', 'all_features (40)']
- preprocessor__onehot__binning__n_bins: [5]
- preprocessor__poly__degree: [2, 3]

2. Best parameters

- feature_set: all_features (40)
- preprocessor__onehot__binning__n_bins: 5
- preprocessor__poly__degree: 3

3. Tuning details

- Search type: GridSearchCV
- Parameter combinations: 4
- Total tuning time: 32m, 19s
- Total tuning fit time: 10m, 41s
- Total tuning prediction time: 4s

Random Forest

1. Parameter grid/distribution

- max_features: [15, 20, 25, 30, 35, None]
- max_depth: range(10, 26)
- max_leaf_nodes: [3000, 3500, 4000, 4500, None]
- min_samples_leaf: range(1, 26)
- min_samples_split: range(2, 21)
- min_impurity_decrease: [0.0001, 0.001]

2. Best parameters
- max_features: 25
- max_depth: 16
- max_leaf_nodes: None
- min_samples_leaf: 1
- min_samples_split: 6
- min_impurity_decrease: 0.001

3. Tuning details
- Search type: RandomizedSearchCV
- Parameter combinations: 50
- Total tuning time: 15m, 45s
- Total tuning fit time: 1h, 1m
- Total tuning prediction time: 15s

Extreme Gradient Boosting (XGBoost)

1. Parameter grid/distribution
- max_depth: [5, 7, 9]
- learning_rate: [0.05, 0.1]
- subsample: [0.6, 0.8, 1.0]
- colsample_bytree: [0.6, 0.8, 1.0]

2. Best parameters
- max_depth: 7
- learning_rate: 0.05
- subsample: 0.8
- colsample_bytree: 0.8

3. Tuning details
- Search type: GridSearchCV
- Parameter combinations: 54
- Total tuning time: 13m, 12s
- Total tuning fit time: 49m, 3s
- Total tuning prediction time: 1m, 52s

Kernel Machine

1. Parameter grid/distribution
- scaler: [StandardScaler(), MinMaxScaler()]
- SVM__C: [10, 100, 200]
- SVM__gamma: ['scale', 'auto']
- SVM__epsilon: [0.01, 0.1, 1]

2. Best parameters
- scaler: MinMaxScaler()
- SVM__C: 100

- SVM__gamma: scale
- SVM__epsilon: 1

3. Tuning details

- Search type: GridSearchCV
- Parameter combinations: 36
- Total tuning time: 47m, 36s
- Total tuning fit time: 2h, 15m
- Total tuning prediction time: 50m, 7s

Neural Network (NN)

1. Parameter grid/distribution

- mlpregressor__solver: ['sgd', 'adam']
- mlpregressor__alpha: [0.001, 0.01, 0.1, 1]
- mlpregressor__batch_size: [32, 64, 128]
- mlpregressor__learning_rate_init: [0.0001, 0.0005]
- mlpregressor__early_stopping: [False]

2. Best parameters

- mlpregressor__solver: sgd
- mlpregressor__alpha: 0.1
- mlpregressor__batch_size: 32
- mlpregressor__learning_rate_init: 0.0005
- mlpregressor__early_stopping: False

3. Tuning details

- Search type: GridSearchCV
- Parameter combinations: 48
- Total tuning time: 1h, 26m
- Total tuning fit time: 5h, 41m
- Total tuning prediction time: 6s