Fitting 10 folds for each of 15552 candidates, totalling 155520 fits

Best Model for outer fold 0: XGBClassifier(base\_score=None, booster=None, callbacks=None,

colsample\_bylevel=None, colsample\_bynode=None,

colsample\_bytree=0.75, early\_stopping\_rounds=None,

enable\_categorical=False, eval\_metric=None, feature\_types=None,

gamma=0.25, gpu\_id=None, grow\_policy=None, importance\_type=None,

interaction\_constraints=None, learning\_rate=0.17333333333333334,

max\_bin=None, max\_cat\_threshold=None, max\_cat\_to\_onehot=None,

max\_delta\_step=None, max\_depth=8, max\_leaves=None,

min\_child\_weight=1, missing=nan, monotone\_constraints=None,

n\_estimators=200, n\_jobs=None, num\_parallel\_tree=None,

predictor=None, random\_state=None, ...)

The best parameters found for outer fold 0: {'colsample\_bytree': 0.75, 'gamma': 0.25, 'learning\_rate': 0.17333333333333334, 'max\_depth': 8, 'min\_child\_weight': 1, 'n\_estimators': 200, 'scale\_pos\_weight': 1.4422799422799424, 'subsample': 0.75}

The mean CV score of the best model is: 0.843

Classification Report for fold 0:

precision recall f1-score support

0 0.93 0.93 0.93 1616

1 0.80 0.83 0.81 595

accuracy 0.90 2211

macro avg 0.87 0.88 0.87 2211

weighted avg 0.90 0.90 0.90 2211

Fitting 10 folds for each of 15552 candidates, totalling 155520 fits

Best Model for outer fold 1: XGBClassifier(base\_score=None, booster=None, callbacks=None,

colsample\_bylevel=None, colsample\_bynode=None,

colsample\_bytree=1.0, early\_stopping\_rounds=None,

enable\_categorical=False, eval\_metric=None, feature\_types=None,

gamma=0.0, gpu\_id=None, grow\_policy=None, importance\_type=None,

interaction\_constraints=None, learning\_rate=0.33666666666666667,

max\_bin=None, max\_cat\_threshold=None, max\_cat\_to\_onehot=None,

max\_delta\_step=None, max\_depth=8, max\_leaves=None,

min\_child\_weight=1, missing=nan, monotone\_constraints=None,

n\_estimators=200, n\_jobs=None, num\_parallel\_tree=None,

predictor=None, random\_state=None, ...)

The best parameters found for outer fold 1: {'colsample\_bytree': 1.0, 'gamma': 0.0, 'learning\_rate': 0.33666666666666667, 'max\_depth': 8, 'min\_child\_weight': 1, 'n\_estimators': 200, 'scale\_pos\_weight': 1.4422799422799424, 'subsample': 0.75}

The mean CV score of the best model is: 0.859

Classification Report for fold 1:

precision recall f1-score support

0 0.88 0.94 0.91 1639

1 0.78 0.63 0.70 571

accuracy 0.86 2210

macro avg 0.83 0.78 0.80 2210

weighted avg 0.85 0.86 0.85 2210

Fitting 10 folds for each of 15552 candidates, totalling 155520 fits

Best Model for outer fold 2: XGBClassifier(base\_score=None, booster=None, callbacks=None,

colsample\_bylevel=None, colsample\_bynode=None,

colsample\_bytree=1.0, early\_stopping\_rounds=None,

enable\_categorical=False, eval\_metric=None, feature\_types=None,

gamma=0.0, gpu\_id=None, grow\_policy=None, importance\_type=None,

interaction\_constraints=None, learning\_rate=0.5, max\_bin=None,

max\_cat\_threshold=None, max\_cat\_to\_onehot=None,

max\_delta\_step=None, max\_depth=8, max\_leaves=None,

min\_child\_weight=1, missing=nan, monotone\_constraints=None,

n\_estimators=200, n\_jobs=None, num\_parallel\_tree=None,

predictor=None, random\_state=None, ...)

The best parameters found for outer fold 2: {'colsample\_bytree': 1.0, 'gamma': 0.0, 'learning\_rate': 0.5, 'max\_depth': 8, 'min\_child\_weight': 1, 'n\_estimators': 200, 'scale\_pos\_weight': 1.4422799422799424, 'subsample': 0.75}

The mean CV score of the best model is: 0.857

Classification Report for fold 2:

precision recall f1-score support

0 0.87 0.93 0.90 1643

1 0.76 0.61 0.68 566

accuracy 0.85 2209

macro avg 0.82 0.77 0.79 2209

weighted avg 0.85 0.85 0.85 2209

Fitting 10 folds for each of 15552 candidates, totalling 155520 fits

Best Model for outer fold 3: XGBClassifier(base\_score=None, booster=None, callbacks=None,

colsample\_bylevel=None, colsample\_bynode=None,

colsample\_bytree=1.0, early\_stopping\_rounds=None,

enable\_categorical=False, eval\_metric=None, feature\_types=None,

gamma=0.0, gpu\_id=None, grow\_policy=None, importance\_type=None,

interaction\_constraints=None, learning\_rate=0.17333333333333334,

max\_bin=None, max\_cat\_threshold=None, max\_cat\_to\_onehot=None,

max\_delta\_step=None, max\_depth=8, max\_leaves=None,

min\_child\_weight=1, missing=nan, monotone\_constraints=None,

n\_estimators=200, n\_jobs=None, num\_parallel\_tree=None,

predictor=None, random\_state=None, ...)

The best parameters found for outer fold 3: {'colsample\_bytree': 1.0, 'gamma': 0.0, 'learning\_rate': 0.17333333333333334, 'max\_depth': 8, 'min\_child\_weight': 1, 'n\_estimators': 200, 'scale\_pos\_weight': 1.4422799422799424, 'subsample': 0.5}

The mean CV score of the best model is: 0.847

Classification Report for fold 3:

precision recall f1-score support

0 0.90 0.96 0.93 1676

1 0.84 0.65 0.73 535

accuracy 0.89 2211

macro avg 0.87 0.81 0.83 2211

weighted avg 0.88 0.89 0.88 2211

Fitting 10 folds for each of 15552 candidates, totalling 155520 fits

Best Model for outer fold 4: XGBClassifier(base\_score=None, booster=None, callbacks=None,

colsample\_bylevel=None, colsample\_bynode=None,

colsample\_bytree=1.0, early\_stopping\_rounds=None,

enable\_categorical=False, eval\_metric=None, feature\_types=None,

gamma=0.25, gpu\_id=None, grow\_policy=None, importance\_type=None,

interaction\_constraints=None, learning\_rate=0.33666666666666667,

max\_bin=None, max\_cat\_threshold=None, max\_cat\_to\_onehot=None,

max\_delta\_step=None, max\_depth=8, max\_leaves=None,

min\_child\_weight=1, missing=nan, monotone\_constraints=None,

n\_estimators=150, n\_jobs=None, num\_parallel\_tree=None,

predictor=None, random\_state=None, ...)

The best parameters found for outer fold 4: {'colsample\_bytree': 1.0, 'gamma': 0.25, 'learning\_rate': 0.33666666666666667, 'max\_depth': 8, 'min\_child\_weight': 1, 'n\_estimators': 150, 'scale\_pos\_weight': 1.4422799422799424, 'subsample': 0.75}

The mean CV score of the best model is: 0.843

Classification Report for fold 4:

precision recall f1-score support

0 0.89 0.94 0.92 1734

1 0.73 0.58 0.65 479

accuracy 0.86 2213

macro avg 0.81 0.76 0.78 2213

weighted avg 0.86 0.86 0.86 2213

Fitting 10 folds for each of 15552 candidates, totalling 155520 fits

Best Model for outer fold 5: XGBClassifier(base\_score=None, booster=None, callbacks=None,

colsample\_bylevel=None, colsample\_bynode=None,

colsample\_bytree=1.0, early\_stopping\_rounds=None,

enable\_categorical=False, eval\_metric=None, feature\_types=None,

gamma=0.25, gpu\_id=None, grow\_policy=None, importance\_type=None,

interaction\_constraints=None, learning\_rate=0.17333333333333334,

max\_bin=None, max\_cat\_threshold=None, max\_cat\_to\_onehot=None,

max\_delta\_step=None, max\_depth=8, max\_leaves=None,

min\_child\_weight=1, missing=nan, monotone\_constraints=None,

n\_estimators=200, n\_jobs=None, num\_parallel\_tree=None,

predictor=None, random\_state=None, ...)

The best parameters found for outer fold 5: {'colsample\_bytree': 1.0, 'gamma': 0.25, 'learning\_rate': 0.17333333333333334, 'max\_depth': 8, 'min\_child\_weight': 1, 'n\_estimators': 200, 'scale\_pos\_weight': 1.4422799422799424, 'subsample': 0.75}

The mean CV score of the best model is: 0.843

Classification Report for fold 5:

precision recall f1-score support

0 0.88 0.94 0.91 1596

1 0.83 0.68 0.75 615

accuracy 0.87 2211

macro avg 0.86 0.81 0.83 2211

weighted avg 0.87 0.87 0.87 2211

Fitting 10 folds for each of 15552 candidates, totalling 155520 fits

Best Model for outer fold 6: XGBClassifier(base\_score=None, booster=None, callbacks=None,

colsample\_bylevel=None, colsample\_bynode=None,

colsample\_bytree=1.0, early\_stopping\_rounds=None,

enable\_categorical=False, eval\_metric=None, feature\_types=None,

gamma=0.0, gpu\_id=None, grow\_policy=None, importance\_type=None,

interaction\_constraints=None, learning\_rate=0.33666666666666667,

max\_bin=None, max\_cat\_threshold=None, max\_cat\_to\_onehot=None,

max\_delta\_step=None, max\_depth=8, max\_leaves=None,

min\_child\_weight=1, missing=nan, monotone\_constraints=None,

n\_estimators=150, n\_jobs=None, num\_parallel\_tree=None,

predictor=None, random\_state=None, ...)

The best parameters found for outer fold 6: {'colsample\_bytree': 1.0, 'gamma': 0.0, 'learning\_rate': 0.33666666666666667, 'max\_depth': 8, 'min\_child\_weight': 1, 'n\_estimators': 150, 'scale\_pos\_weight': 5.7691197691197695, 'subsample': 0.75}

The mean CV score of the best model is: 0.838

Classification Report for fold 6:

precision recall f1-score support

0 0.89 0.94 0.91 1534

1 0.85 0.73 0.79 677

accuracy 0.88 2211

macro avg 0.87 0.84 0.85 2211

weighted avg 0.88 0.88 0.88 2211

Fitting 10 folds for each of 15552 candidates, totalling 155520 fits

Best Model for outer fold 7: XGBClassifier(base\_score=None, booster=None, callbacks=None,

colsample\_bylevel=None, colsample\_bynode=None,

colsample\_bytree=1.0, early\_stopping\_rounds=None,

enable\_categorical=False, eval\_metric=None, feature\_types=None,

gamma=0.25, gpu\_id=None, grow\_policy=None, importance\_type=None,

interaction\_constraints=None, learning\_rate=0.17333333333333334,

max\_bin=None, max\_cat\_threshold=None, max\_cat\_to\_onehot=None,

max\_delta\_step=None, max\_depth=8, max\_leaves=None,

min\_child\_weight=1, missing=nan, monotone\_constraints=None,

n\_estimators=200, n\_jobs=None, num\_parallel\_tree=None,

predictor=None, random\_state=None, ...)

The best parameters found for outer fold 7: {'colsample\_bytree': 1.0, 'gamma': 0.25, 'learning\_rate': 0.17333333333333334, 'max\_depth': 8, 'min\_child\_weight': 1, 'n\_estimators': 200, 'scale\_pos\_weight': 1.4422799422799424, 'subsample': 0.75}

The mean CV score of the best model is: 0.844

Classification Report for fold 7:

precision recall f1-score support

0 0.90 0.95 0.92 1675

1 0.81 0.66 0.73 539

accuracy 0.88 2214

macro avg 0.85 0.81 0.83 2214

weighted avg 0.88 0.88 0.88 2214

Fitting 10 folds for each of 15552 candidates, totalling 155520 fits

Best Model for outer fold 8: XGBClassifier(base\_score=None, booster=None, callbacks=None,

colsample\_bylevel=None, colsample\_bynode=None,

colsample\_bytree=0.75, early\_stopping\_rounds=None,

enable\_categorical=False, eval\_metric=None, feature\_types=None,

gamma=0.0, gpu\_id=None, grow\_policy=None, importance\_type=None,

interaction\_constraints=None, learning\_rate=0.33666666666666667,

max\_bin=None, max\_cat\_threshold=None, max\_cat\_to\_onehot=None,

max\_delta\_step=None, max\_depth=8, max\_leaves=None,

min\_child\_weight=3, missing=nan, monotone\_constraints=None,

n\_estimators=200, n\_jobs=None, num\_parallel\_tree=None,

predictor=None, random\_state=None, ...)

The best parameters found for outer fold 8: {'colsample\_bytree': 0.75, 'gamma': 0.0, 'learning\_rate': 0.33666666666666667, 'max\_depth': 8, 'min\_child\_weight': 3, 'n\_estimators': 200, 'scale\_pos\_weight': 1.4422799422799424, 'subsample': 0.75}

The mean CV score of the best model is: 0.844

Classification Report for fold 8:

precision recall f1-score support

0 0.90 0.93 0.92 1613

1 0.80 0.71 0.76 600

accuracy 0.87 2213

macro avg 0.85 0.82 0.84 2213

weighted avg 0.87 0.87 0.87 2213

Fitting 10 folds for each of 15552 candidates, totalling 155520 fits

Best Model for outer fold 9: XGBClassifier(base\_score=None, booster=None, callbacks=None,

colsample\_bylevel=None, colsample\_bynode=None,

colsample\_bytree=1.0, early\_stopping\_rounds=None,

enable\_categorical=False, eval\_metric=None, feature\_types=None,

gamma=0.0, gpu\_id=None, grow\_policy=None, importance\_type=None,

interaction\_constraints=None, learning\_rate=0.17333333333333334,

max\_bin=None, max\_cat\_threshold=None, max\_cat\_to\_onehot=None,

max\_delta\_step=None, max\_depth=8, max\_leaves=None,

min\_child\_weight=1, missing=nan, monotone\_constraints=None,

n\_estimators=200, n\_jobs=None, num\_parallel\_tree=None,

predictor=None, random\_state=None, ...)

The best parameters found for outer fold 9: {'colsample\_bytree': 1.0, 'gamma': 0.0, 'learning\_rate': 0.17333333333333334, 'max\_depth': 8, 'min\_child\_weight': 1, 'n\_estimators': 200, 'scale\_pos\_weight': 3.6056998556998563, 'subsample': 0.5}

The mean CV score of the best model is: 0.837

Classification Report for fold 9:

precision recall f1-score support

0 0.88 0.93 0.90 1471

1 0.83 0.75 0.79 740

accuracy 0.87 2211

macro avg 0.86 0.84 0.85 2211

weighted avg 0.87 0.87 0.87 2211

fold\_0 fold\_1 fold\_2 fold\_3 fold\_4 \

co2\_concentration 0.036486 0.031948 0.029966 0.046213 0.041938

air\_temperature 0.036147 0.026203 0.023591 0.034584 0.023533

relative\_humidity 0.024679 0.017118 0.017484 0.028754 0.020809

kitchen 0.090840 0.095748 0.093133 0.077003 0.076370

livingroom 0.069342 0.077472 0.067233 0.060995 0.047848

bedroom 0.154085 0.094492 0.120250 0.125046 0.158380

office 0.306687 0.420615 0.423694 0.268442 0.356483

kitchen\_livingroom 0.098239 0.076522 0.076965 0.170872 0.103079

day\_sin 0.032426 0.025082 0.020755 0.029711 0.027231

day\_cos 0.029494 0.027443 0.025632 0.037556 0.033687

hour\_sin 0.062322 0.053747 0.065923 0.069838 0.055257

hour\_cos 0.059252 0.053610 0.035374 0.050986 0.055387

fold\_5 fold\_6 fold\_7 fold\_8 fold\_9 mean

co2\_concentration 0.032786 0.038453 0.028904 0.034926 0.048487 0.037011

air\_temperature 0.025517 0.030204 0.024656 0.035527 0.036382 0.029634

relative\_humidity 0.020028 0.019288 0.018068 0.028815 0.029520 0.022456

kitchen 0.099911 0.079361 0.047725 0.091987 0.084472 0.083655

livingroom 0.079607 0.053724 0.064980 0.098727 0.043836 0.066376

bedroom 0.064326 0.075093 0.158463 0.189333 0.117317 0.125679

office 0.426880 0.457315 0.225330 0.298714 0.357770 0.354193

kitchen\_livingroom 0.094518 0.059923 0.253672 0.060840 0.092709 0.108734

day\_sin 0.023216 0.033706 0.025326 0.026643 0.040609 0.028470

day\_cos 0.028933 0.047208 0.026755 0.030955 0.035008 0.032267

hour\_sin 0.054433 0.057539 0.067730 0.053374 0.058438 0.059860

hour\_cos 0.049843 0.048186 0.058391 0.050159 0.055452 0.051664

A graph with a line

Description automatically generated

Metrics for outer fold 0:

Best parameters: {'colsample\_bytree': 0.75, 'gamma': 0.25, 'learning\_rate': 0.17333333333333334, 'max\_depth': 8, 'min\_child\_weight': 1, 'n\_estimators': 200, 'scale\_pos\_weight': 1.4422799422799424, 'subsample': 0.75}

Balanced accuracy score: 0.8751669232049255

Confusion matrix:

[[1495 121]

[ 104 491]]

Precision: 0.8022875816993464

Recall: 0.8252100840336134

F1 score: 0.8135874067937034

MCC: 0.7437616054293321

AU\_ROC: 0.8751669232049255

Brier score loss: 0.07774519472944554

Accuracy score: 0.898236092265943

Metrics for outer fold 1:

Best parameters: {'colsample\_bytree': 1.0, 'gamma': 0.0, 'learning\_rate': 0.33666666666666667, 'max\_depth': 8, 'min\_child\_weight': 1, 'n\_estimators': 200, 'scale\_pos\_weight': 1.4422799422799424, 'subsample': 0.75}

Balanced accuracy score: 0.7832837715534973

Confusion matrix:

[[1540 99]

[ 213 358]]

Precision: 0.7833698030634574

Recall: 0.626970227670753

F1 score: 0.6964980544747081

MCC: 0.6123647235028269

AU\_ROC: 0.7832837715534973

Brier score loss: 0.1099108542749189

Accuracy score: 0.8588235294117647

Metrics for outer fold 2:

Best parameters: {'colsample\_bytree': 1.0, 'gamma': 0.0, 'learning\_rate': 0.5, 'max\_depth': 8, 'min\_child\_weight': 1, 'n\_estimators': 200, 'scale\_pos\_weight': 1.4422799422799424, 'subsample': 0.75}

Balanced accuracy score: 0.7724826816411416

Confusion matrix:

[[1534 109]

[ 220 346]]

Precision: 0.7604395604395604

Recall: 0.6113074204946997

F1 score: 0.6777668952007836

MCC: 0.5882682440356657

AU\_ROC: 0.7724826816411416

Brier score loss: 0.12386171921235785

Accuracy score: 0.851063829787234

Metrics for outer fold 3:

Best parameters: {'colsample\_bytree': 1.0, 'gamma': 0.0, 'learning\_rate': 0.17333333333333334, 'max\_depth': 8, 'min\_child\_weight': 1, 'n\_estimators': 200, 'scale\_pos\_weight': 1.4422799422799424, 'subsample': 0.5}

Balanced accuracy score: 0.8065180782013248

Confusion matrix:

[[1607 69]

[ 185 350]]

Precision: 0.8353221957040573

Recall: 0.6542056074766355

F1 score: 0.7337526205450733

MCC: 0.6699215889709257

AU\_ROC: 0.8065180782013248

Brier score loss: 0.0872396095865129

Accuracy score: 0.885119855269109

Metrics for outer fold 4:

Best parameters: {'colsample\_bytree': 1.0, 'gamma': 0.25, 'learning\_rate': 0.33666666666666667, 'max\_depth': 8, 'min\_child\_weight': 1, 'n\_estimators': 150, 'scale\_pos\_weight': 1.4422799422799424, 'subsample': 0.75}

Balanced accuracy score: 0.7592651453311277

Confusion matrix:

[[1634 100]

[ 203 276]]

Precision: 0.7340425531914894

Recall: 0.5762004175365344

F1 score: 0.6456140350877192

MCC: 0.5686145049502216

AU\_ROC: 0.7592651453311277

Brier score loss: 0.11064377559861177

Accuracy score: 0.8630817894261184

Metrics for outer fold 5:

Best parameters: {'colsample\_bytree': 1.0, 'gamma': 0.25, 'learning\_rate': 0.17333333333333334, 'max\_depth': 8, 'min\_child\_weight': 1, 'n\_estimators': 200, 'scale\_pos\_weight': 1.4422799422799424, 'subsample': 0.75}

Balanced accuracy score: 0.8122684760682193

Confusion matrix:

[[1508 88]

[ 197 418]]

Precision: 0.8260869565217391

Recall: 0.6796747967479675

F1 score: 0.7457627118644067

MCC: 0.6661540778959318

AU\_ROC: 0.8122684760682193

Brier score loss: 0.09620684979214957

Accuracy score: 0.8710990502035278

Metrics for outer fold 6:

Best parameters: {'colsample\_bytree': 1.0, 'gamma': 0.0, 'learning\_rate': 0.33666666666666667, 'max\_depth': 8, 'min\_child\_weight': 1, 'n\_estimators': 150, 'scale\_pos\_weight': 5.7691197691197695, 'subsample': 0.75}

Balanced accuracy score: 0.8380514348330987

Confusion matrix:

[[1445 89]

[ 180 497]]

Precision: 0.8481228668941979

Recall: 0.7341211225997046

F1 score: 0.7870150435471102

MCC: 0.7060643804518788

AU\_ROC: 0.8380514348330987

Brier score loss: 0.10149266357625598

Accuracy score: 0.8783355947535052

Metrics for outer fold 7:

Best parameters: {'colsample\_bytree': 1.0, 'gamma': 0.25, 'learning\_rate': 0.17333333333333334, 'max\_depth': 8, 'min\_child\_weight': 1, 'n\_estimators': 200, 'scale\_pos\_weight': 1.4422799422799424, 'subsample': 0.75}

Balanced accuracy score: 0.8064248331625731

Confusion matrix:

[[1589 86]

[ 181 358]]

Precision: 0.8063063063063063

Recall: 0.6641929499072357

F1 score: 0.728382502543235

MCC: 0.6568672720921793

AU\_ROC: 0.8064248331625731

Brier score loss: 0.09271998756360354

Accuracy score: 0.8794037940379403

Metrics for outer fold 8:

Best parameters: {'colsample\_bytree': 0.75, 'gamma': 0.0, 'learning\_rate': 0.33666666666666667, 'max\_depth': 8, 'min\_child\_weight': 3, 'n\_estimators': 200, 'scale\_pos\_weight': 1.4422799422799424, 'subsample': 0.75}

Balanced accuracy score: 0.824641971481711

Confusion matrix:

[[1507 106]

[ 171 429]]

Precision: 0.8018691588785046

Recall: 0.715

F1 score: 0.7559471365638767

MCC: 0.6741469940206729

AU\_ROC: 0.824641971481711

Brier score loss: 0.10047610418485874

Accuracy score: 0.8748305467690918

Metrics for outer fold 9:

Best parameters: {'colsample\_bytree': 1.0, 'gamma': 0.0, 'learning\_rate': 0.17333333333333334, 'max\_depth': 8, 'min\_child\_weight': 1, 'n\_estimators': 200, 'scale\_pos\_weight': 3.6056998556998563, 'subsample': 0.5}

Balanced accuracy score: 0.8382861447443364

Confusion matrix:

[[1361 110]

[ 184 556]]

Precision: 0.8348348348348348

Recall: 0.7513513513513513

F1 score: 0.7908961593172119

MCC: 0.6958811076787741

AU\_ROC: 0.8382861447443364

Brier score loss: 0.09911641921287187

Accuracy score: 0.8670284938941656

Cumulative confusion matrix:

[[15220 977]

[ 1838 4079]]

Average balanced accuracy score: 0.8116389460221954 with std dev of: 0.03278204668327038

Average precision: 0.8032681817533494 with std dev of: 0.034045742212961985

Average recall: 0.6838233977818494 with std dev of: 0.07028897202093373

Average F1 score: 0.7375222565937828 with std dev of: 0.05028931561218551

Average MCC: 0.658204449902841 with std dev of: 0.05148328145122536

Average ROC-AUC: 0.8116389460221954 with std dev of: 0.03278204668327038

Average accuracy: 0.87270225758184 with std dev of: 0.012944126344727054

Average Brier loss: 0.87270225758184 with std dev of: 0.012286529716102253

FINAL MODEL

Fitting 10 folds for each of 15552 candidates, totalling 155520 fits

Best Model for final cross validation: XGBClassifier(base\_score=None, booster=None, callbacks=None,

colsample\_bylevel=None, colsample\_bynode=None,

colsample\_bytree=1.0, early\_stopping\_rounds=None,

enable\_categorical=False, eval\_metric=None, feature\_types=None,

gamma=0.25, gpu\_id=None, grow\_policy=None, importance\_type=None,

interaction\_constraints=None, learning\_rate=0.17333333333333334,

max\_bin=None, max\_cat\_threshold=None, max\_cat\_to\_onehot=None,

max\_delta\_step=None, max\_depth=8, max\_leaves=None,

min\_child\_weight=1, missing=nan, monotone\_constraints=None,

n\_estimators=200, n\_jobs=None, num\_parallel\_tree=None,

predictor=None, random\_state=None, ...)

The best parameters found for final cross validation: {'colsample\_bytree': 1.0, 'gamma': 0.25, 'learning\_rate': 0.17333333333333334, 'max\_depth': 8, 'min\_child\_weight': 1, 'n\_estimators': 200, 'scale\_pos\_weight': 3.6056998556998563, 'subsample': 0.75}

The mean CV score of the final cross validation model is: 0.8552576024349294