[54]:
```
from sklearn.model_selection import cross_val_predict
from sklearn.metrics import precision_recall_curve

# Use cross_val_predict to get the predicted probabilities
y_scores = cross_val_predict(xgb_classifier_opt, X_train_4, y_less_train, cv=5,␣
 ↪method='predict_proba')[:, 1]

# Calculate precision, recall, and thresholds
precisions, recalls, thresholds = precision_recall_curve(y_less_train, y_scores)

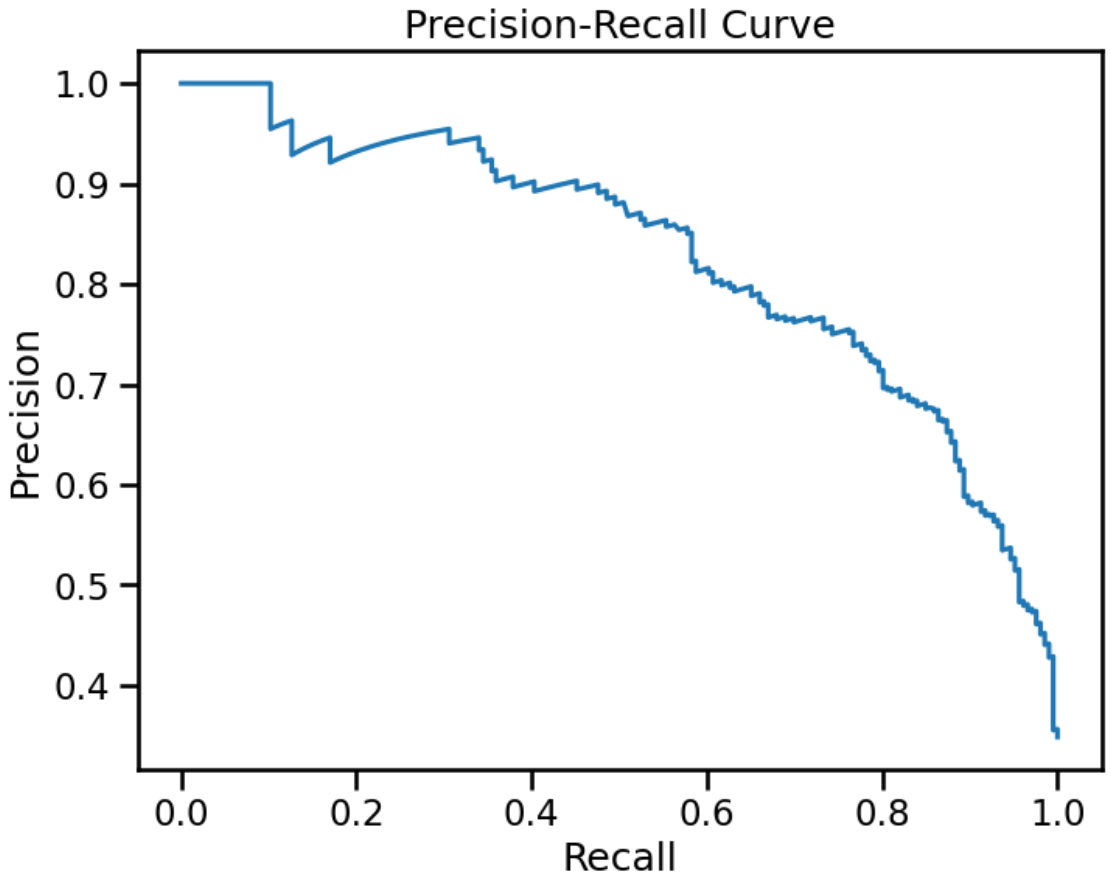
# Plot the precision-recall curve
plt.figure(figsize=(8, 6))
plt.plot(recalls, precisions)
plt.xlabel('Recall')
plt.ylabel('Precision')
plt.title('Precision-Recall Curve')
plt.show()

# Choose a threshold that corresponds to your desired recall target
# For example, if you want a recall of 0.9 or higher
desired_recall = 0.9
chosen_threshold = thresholds[np.argmax(recalls >= desired_recall)]

print(f'Chosen threshold: {chosen_threshold:.2f}')

# Use the chosen threshold to make predictions on the test set
y_pred_binary = (y_pred_proba_opt[:, 1] >= chosen_threshold).astype(int)

# Evaluate the performance on the test set
print(classification_report(y_less_test, y_pred_binary))
```




```
Chosen threshold: 0.01
              precision    recall  f1-score   support

           0       0.00      0.00      0.00       115
           1       0.35      1.00      0.52        62

    accuracy                           0.35       177
   macro avg       0.18      0.50      0.26       177
weighted avg       0.12      0.35      0.18       177

/home/a/anaconda3/lib/python3.11/site-
packages/sklearn/metrics/_classification.py:1469: UndefinedMetricWarning:
Precision and F-score are ill-defined and being set to 0.0 in labels with no
predicted samples. Use `zero_division` parameter to control this behavior.
  _warn_prf(average, modifier, msg_start, len(result))
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