

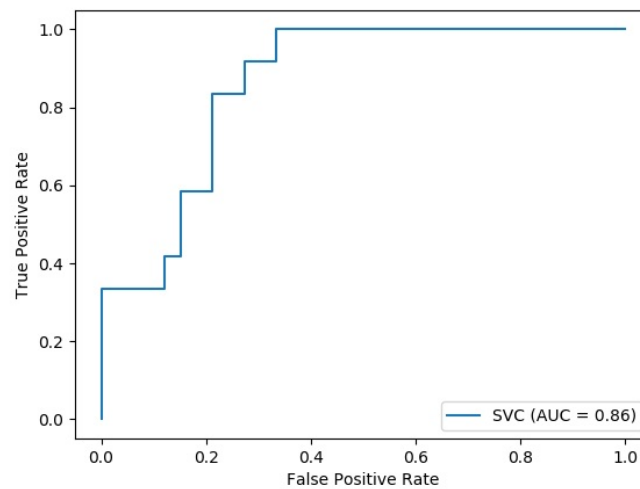
## 5. Visualizations

Scikit-learn defines a simple API for creating visualizations for machine learning. The key feature of this API is to allow for quick plotting and visual adjustments without recalculation. In the following example, we plot a ROC curve for a fitted support vector machine:

```
from sklearn.model_selection import train_test_split
from sklearn.svm import SVC
from sklearn.metrics import plot_roc_curve
from sklearn.datasets import load_wine

X_train, X_test, y_train, y_test = train_test_split(X, y, random_state=42)
svc = SVC(random_state=42)
svc.fit(X_train, y_train)

svc_disp = plot_roc_curve(svc, X_test, y_test)
```

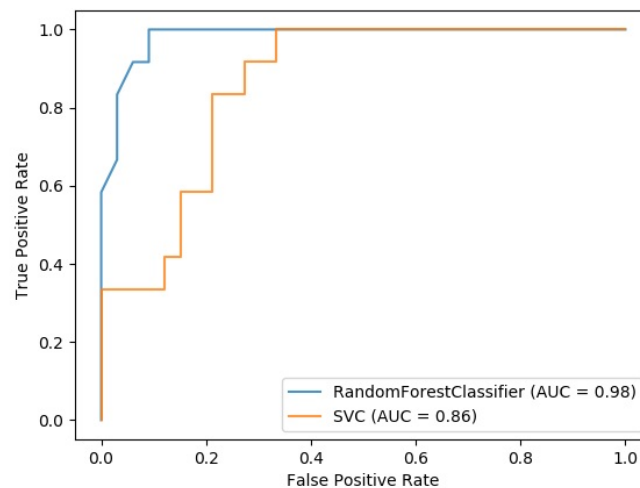


The returned `svc_disp` object allows us to continue using the already computed ROC curve for SVC in future plots. In this case, the `svc_disp` is a `RocCurveDisplay` that stores the computed values as attributes called `roc_auc`, `fpr`, and `tpr`. Next, we train a random forest classifier and plot the previously computed roc curve again by using the `plot` method of the `Display` object.

```
import matplotlib.pyplot as plt
from sklearn.ensemble import RandomForestClassifier

rfc = RandomForestClassifier(random_state=42)
rfc.fit(X_train, y_train)

ax = plt.gca()
rfc_disp = plot_roc_curve(rfc, X_test, y_test, ax=ax, alpha=0.8)
svc_disp.plot(ax=ax, alpha=0.8)
```



Notice that we pass `alpha=0.8` to the plot functions to adjust the alpha values of the curves.

### Examples:

- [ROC Curve with Visualization API](#)
- [Advanced Plotting With Partial Dependence](#)

## 5.1. Available Plotting Utilities

### 5.1.1. Functions

<a href="#">inspection.plot_partial_dependence(...[, ...])</a>	Partial dependence plots.
<a href="#">metrics.plot_confusion_matrix(estimator, X, ...)</a>	Plot Confusion Matrix.
<a href="#">metrics.plot_precision_recall_curve(...[, ...])</a>	Plot Precision Recall Curve for binary classifiers.
<a href="#">metrics.plot_roc_curve(estimator, X, y[, ...])</a>	Plot Receiver operating characteristic (ROC) curve.

### 5.1.2. Display Objects

<a href="#">inspection.PartialDependenceDisplay(...)</a>	Partial Dependence Plot (PDP) visualization.
<a href="#">metrics.ConfusionMatrixDisplay(...)</a>	Confusion Matrix visualization.
<a href="#">metrics.PrecisionRecallDisplay(precision, ...)</a>	Precision Recall visualization.
<a href="#">metrics.RocCurveDisplay(fpr, tpr, roc_auc, ...)</a>	ROC Curve visualization.

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