`sklearn.metrics`.roc_curve

`sklearn.metrics.roc_curve`(*y_true*, *y_score*, ***, *pos_label=None*, *sample_weight=None*, *drop_intermediate=True*) [source]

Compute Receiver operating characteristic (ROC).

Note: this implementation is restricted to the binary classification task.

Read more in the User Guide.

Parameters:

y_true : ***ndarray of shape (n_samples,)***

True binary labels. If labels are not either {-1, 1} or {0, 1}, then pos_label should be explicitly given.

y_score : ***ndarray of shape (n_samples,)***

Target scores, can either be probability estimates of the positive class, confidence values, or non-thresholded measure of decisions (as returned by "decision_function" on some classifiers).

pos_label : ***int or str, default=None***

The label of the positive class. When `pos_label=None`, if `y_true` is in {-1, 1} or {0, 1}, `pos_label` is set to 1, otherwise an error will be raised.

sample_weight : ***array-like of shape (n_samples,), default=None***

Sample weights.

drop_intermediate : ***bool, default=True***

Whether to drop some suboptimal thresholds which would not appear on a plotted ROC curve. This is useful in order to create lighter ROC curves.

New in version 0.17: parameter *drop_intermediate*.

Returns:

fpr : ***ndarray of shape (>2,)***

Increasing false positive rates such that element i is the false positive rate of predictions with score >= `thresholds[i]`.

tpr : ***ndarray of shape (>2,)***

Increasing true positive rates such that element `i` is the true positive rate of predictions with score >= `thresholds[i]`.

thresholds : ***ndarray of shape = (n_thresholds,)***

Decreasing thresholds on the decision function used to compute fpr and tpr. `thresholds[0]` represents no instances being predicted and is arbitrarily set to `max(y_score) + 1`.

See also:

`RocCurveDisplay.from_estimator`

Plot Receiver Operating Characteristic (ROC) curve given an estimator and some data.

`RocCurveDisplay.from_predictions`

Plot Receiver Operating Characteristic (ROC) curve given the true and predicted values.

`det_curve`

Compute error rates for different probability thresholds.

`roc_auc_score`

Compute the area under the ROC curve.

Notes

Since the thresholds are sorted from low to high values, they are reversed upon returning them to ensure they correspond to both `fpr` and `tpr`, which are sorted in reversed order during their calculation.

References

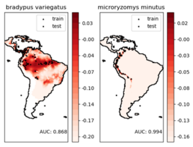
1 Wikipedia entry for the Receiver operating characteristic

2 Fawcett T. An introduction to ROC analysis[J]. Pattern Recognition Letters, 2006, 27(8):861-874.

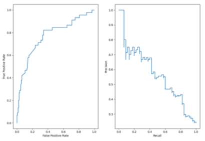
Examples

```
>>> import numpy as np
>>> from sklearn import metrics
>>> y = np.array([1, 1, 2, 2])
>>> scores = np.array([0.1, 0.4, 0.35, 0.8])
>>> fpr, tpr, thresholds = metrics.roc_curve(y, scores, pos_label=2)
>>> fpr
array([0. , 0. , 0.5, 0.5, 1. ])
>>> tpr
array([0. , 0.5, 0.5, 1. , 1. ])
>>> thresholds
array([1.8 , 0.8 , 0.4 , 0.35, 0.1 ])
```

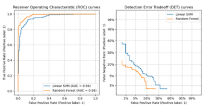
Examples using `sklearn.metrics.roc_curve`



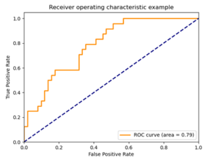
Species distribution modeling



Visualizations with Display Objects



Detection error tradeoff (DET) curve



Receiver Operating Characteristic (ROC)

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