

Macro ROC CURVE

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import numpy as np
import matplotlib.pyplot as plt
from sklearn.metrics import roc_auc_score
from sklearn.metrics import roc_curve

#数据准备
y_true = np.asarray([[0,0,1],[0,1,0],[1,0,0],[0,0,1],[1,0,0],[0,1,0],[0,1,0],[0,1,0],[0,0,1],[0,1,0]])
y_pred =
np.asarray([[0.1,0.2,0.7],[0.1,0.6,0.3],[0.5,0.2,0.3],[0.1,0.1,0.8],[0.4,0.2,0.4],[0.6,0.3,0.1],[0.4,0.2,
0.4],[0.4,0.1,0.5],[0.1,0.1,0.8],[0.1,0.8,0.1]])

#计算 auc
def auc(fpr,tpr):
    auc=0
    len=fpr.size
    for i in range(len-1):
        auc+=(fpr[i+1]-fpr[i])*(tpr[i+1]+tpr[i])
    return auc/2.0

n_classes = len(y_true[1,:])
fpr = dict()
tpr = dict()
roc_auc = dict()

#计算每一种类别的 fpr tpr auc
for i in range(n_classes):
    fpr[i],tpr[i],_=roc_curve(y_true[:,i],y_pred[:,i])

    plt.title('ROC curve',fontsize=14)
    plt.plot(fpr[i],tpr[i])
    plt.ylabel('TPR',fontsize = 14)
    plt.xlabel('FPR',fontsize = 14)

    roc_auc[i] = auc(fpr[i],tpr[i])
    t='class'+str(i)+'_auc='
    print(t+'%.2f'%roc_auc[i])

#绘制 Macro ROC curve
fpr_grid = np.linspace(0.0,1.0,100)
mean_tpr = np.zeros_like(fpr_grid)
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for i in range(n_classes):
    mean_tpr += np.interp(fpr_grid, fpr[i], tpr[i])
mean_tpr /= n_classes

fpr["macro"] = fpr_grid
tpr["macro"] = mean_tpr
plt.title('macro_ROC curve', fontsize=14)
plt.plot(fpr[i], tpr[i])
plt.ylabel('TPR', fontsize=14)
plt.xlabel('FPR', fontsize=14)

#计算 auc
roc_auc["macro"] = auc(fpr["macro"], tpr["macro"])
print('macro_auc=%.2f'%roc_auc["macro"])
```