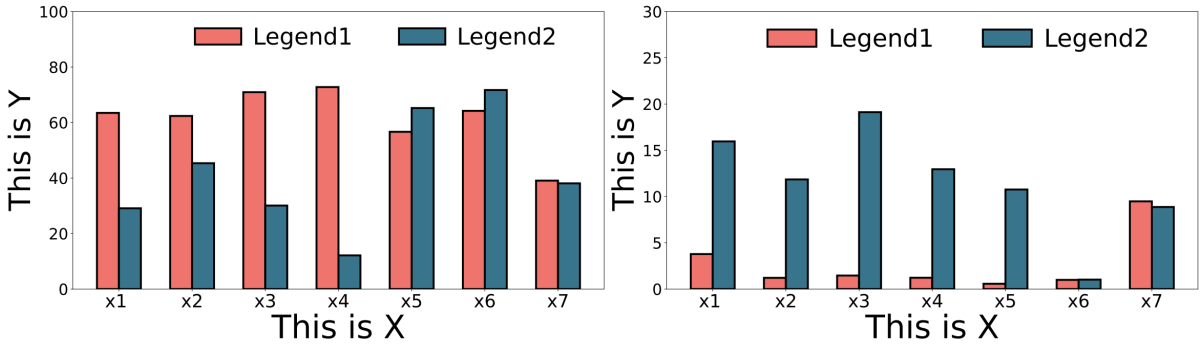
科研制图模板和颜色选择

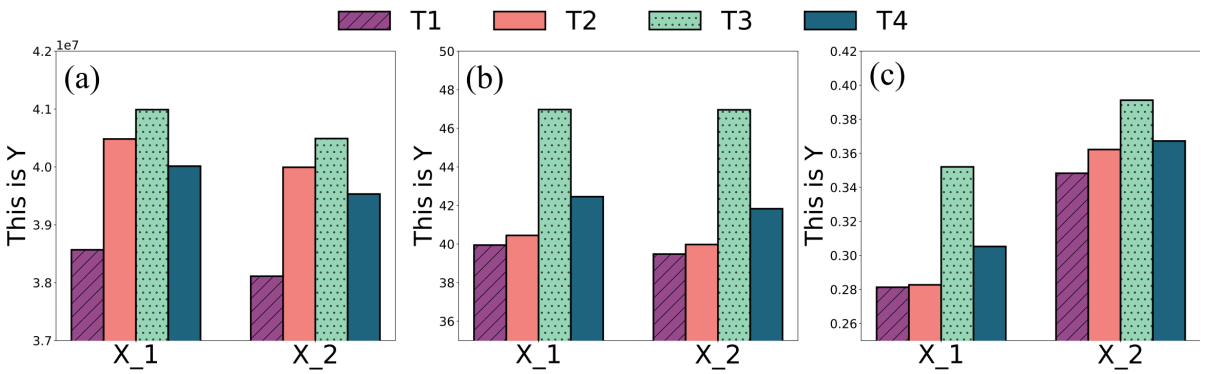
Case1:两子图柱状图




```
#encodeing utf-8
import matplotlib.pyplot as plt
import numpy as np
font = 16
plt.rc('ytick', labelsize=font+8)

# 创建子图
fig, axs = plt.subplots(1, 2, figsize=(26, 7.6))
# 数据
data1 = [0.6347,0.6237,0.7094,0.7278,0.5666,0.6421,0.3907]
data2 = [0.291,0.4534,0.3008,0.1213,0.6522,0.7171,0.3809]
data1 = [idx * 100 for idx in data1]
data2 = [idx * 100 for idx in data2]
# 设置颜色
color1 = '#FFA406'
color2 = '#95252A'
color_cycle = [color1,color2]
x_values = ["x1 ","x2","x3","x4","x5","x6","x7"]  # x轴坐标
bar_labels = ['Legend1', 'Legend2']  # 每个坐标下的两个柱的标签

# 设置柱宽和柱间隔
bar_width = 0.3
bar_gap = 0.02
font=26
# 设置柱子的颜色
color1 = '#f0746e'
color2 = '#38758d'
# 红 蓝 灰 黄

# 计算每组柱的位置(4根柱子计算公式)
bar_positions1 = np.arange(len(x_values)) - 0.5*bar_width   # 左边的柱位置
bar_positions2 = np.arange(len(x_values)) + 0.5*bar_width  # 右边的柱位置

axs[0].bar(bar_positions1, data1,label=bar_labels[0], width=bar_width,
color=color1, edgecolor='black', linewidth=3,zorder=10)
axs[0].bar(bar_positions2, data2, label=bar_labels[1],width=bar_width,
color=color2, edgecolor='black', linewidth=3,zorder=10)

axs[0].set_ylabel("This is Y",fontsize=font+20)
```

```
axs[0].set_xlabel("This is X",fontsize=font+24)

# 设置x轴刻度在两个柱子的中间
x_positions = np.arange(len(x_values))
print(x_positions)
axs[0].set_xticks(x_positions, x_values, fontsize=font+2)
axs[0].set_ylim(0,100)

# 添加图例，无框并排显示
legend=axs[0].legend(loc="upper right", fontsize=font+10, bbox_to_anchor=(0.95,
1.02), ncol=2, frameon=False,handletextpad=0.5)  # 调整图例位置


data1 = [0.0378,0.0121,0.0146,0.0122,0.0057,0.0099,0.0948]
data2 = [0.1596,0.1185,0.1912,0.1295,0.1076,0.0102,0.0887]
data1 = [idx * 100 for idx in data1]
data2 = [idx * 100 for idx in data2]

axs[1].bar(bar_positions1, data1,label=bar_labels[0], width=bar_width,
color=color1, edgecolor='black', linewidth=3,zorder=10)
axs[1].bar(bar_positions2, data2,label=bar_labels[1], width=bar_width,
 color=color2, edgecolor='black', linewidth=3,zorder=10)

# axs[1].set_ylabel("Ratio",fontsize=font+12)
axs[1].set_ylabel("This is Y",fontsize=font+20)
axs[1].set_xlabel("This is X",fontsize=font+24)

# 设置x轴刻度在两个柱子的中间
x_positions = np.arange(len(x_values))
print(x_positions)
axs[1].set_xticks(x_positions, x_values, fontsize=font+2)
axs[1].set_ylim(0,30)

legend=axs[1].legend(loc="upper right", fontsize=font+12, bbox_to_anchor=(0.95,
1.02), ncol=2, frameon=False,handletextpad=0.5)  # 调整图例位置

# 调整布局，以防止子图之间的重叠

plt.tight_layout()
fig.savefig("model1.pdf", format="pdf", bbox_extra_artists=
(legend,),bbox_inches="tight")
# 显示图形
plt.show()
```

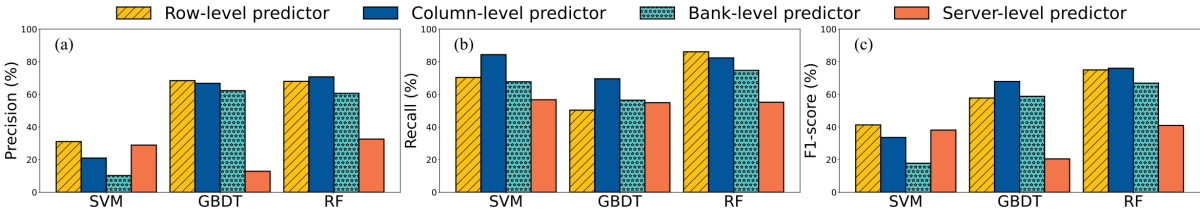
Case2:三子图柱状图




```
#encoding utf-8
import matplotlib.pyplot as plt
import numpy as np
import matplotlib
font = 16
plt.rc('ytick', labelsize=font+6)
bar_labels = ['T1','T2','T3','T4']

# 创建子图
fig, axs = plt.subplots(1, 3, figsize=(30, 8.5))
# 设置柱子的颜色
color1 = '#964a8c'    #'#7C1D6F'
color2 = '#f2827d'
color3 = '#96d5b5'
color4 = '#1f647f'
# 设置相同的颜色
color_cycle = plt.rcParams['axes.prop_cycle'].by_key()['color']
color_cycle = [color1,color2,color3,color4]

# 设置柱宽和柱间隔
bar_width = 0.18
bar_gap = 0.025
font=26
# 设置柱子的颜色
# color1 = '#964a8c'    #'#7C1D6F'
# color2 = '#f2827d'
# color3 = '#96d5b5'
# color4 = '#1f647f'
# 红 蓝 灰 黄

x_values = ["X_1", "X_2"]  # x轴坐标
# 计算每组柱的位置(4根柱子计算公式)
bar_positions1 = np.arange(len(x_values)) - 1.5*bar_width   # 左边的柱位置
bar_positions2 = np.arange(len(x_values)) - bar_width/2  # 右边的柱位置
bar_positions3 = np.arange(len(x_values)) + bar_width/2  # 右边的柱位置
bar_positions4 = np.arange(len(x_values)) + 1.5*bar_width   # 右边的柱位置

data1=[38567563,38110986]
data2=[40482380,39993910]
data3=[40990048,40489834]
data4=[40013360,39531576]
```

```
axs[0].bar(bar_positions1, data1, width=bar_width, label=bar_labels[0],
color=color1, edgecolor='black', linewidth=3,zorder=10, hatch = '/')
axs[0].bar(bar_positions2, data2, width=bar_width, label=bar_labels[1],
color=color2, edgecolor='black', linewidth=3,zorder=10)
axs[0].bar(bar_positions3, data3, width=bar_width, label=bar_labels[2],
color=color3, edgecolor='black', linewidth=3,zorder=10,hatch = '.')
axs[0].bar(bar_positions4, data4, width=bar_width, label=bar_labels[3],
color=color4, edgecolor='black', linewidth=3,zorder=10)
x_positions = np.arange(len(x_values))
axs[0].set_xticks(x_positions, x_values, fontsize=font+20)
axs[0].text(-0.3,41500000, '(a)', fontdict={'family': 'times new roman', 'size':
font+33}, ha='center', va='center')
axs[0].set_ylabel("This is Y",fontsize=font+18)


data1=[39.946951,39.481104]
data2=[40.448513,39.976817]
data3=[46.974343,46.960385]
data4=[42.456602,41.832140]
axs[1].bar(bar_positions1, data1, width=bar_width, label=bar_labels[0],
color=color1, edgecolor='black', linewidth=3,zorder=10, hatch = '/')
axs[1].bar(bar_positions2, data2, width=bar_width, label=bar_labels[1],
color=color2, edgecolor='black', linewidth=3,zorder=10)
axs[1].bar(bar_positions3, data3, width=bar_width, label=bar_labels[2],
color=color3, edgecolor='black', linewidth=3,zorder=10,hatch = '.')
axs[1].bar(bar_positions4, data4, width=bar_width, label=bar_labels[3],
color=color4, edgecolor='black', linewidth=3,zorder=10)
x_positions = np.arange(len(x_values))
axs[1].set_xticks(x_positions, x_values, fontsize=font+20)
axs[1].text(-0.3,48.5, '(b)', fontdict={'family': 'times new roman', 'size':
font+33}, ha='center', va='center')
axs[1].set_ylabel("This is Y",fontsize=font+18)



data1=[0.281301,0.348276]
data2=[0.282715,0.362222]
data3=[0.352019,0.391199]
data4=[0.305245,0.367232]
axs[2].bar(bar_positions1, data1, width=bar_width, label=bar_labels[0],
color=color1, edgecolor='black', linewidth=3,zorder=10, hatch = '/')
axs[2].bar(bar_positions2, data2, width=bar_width, label=bar_labels[1],
color=color2, edgecolor='black', linewidth=3,zorder=10)
axs[2].bar(bar_positions3, data3, width=bar_width, label=bar_labels[2],
color=color3, edgecolor='black', linewidth=3,zorder=10,hatch = '.')
axs[2].bar(bar_positions4, data4, width=bar_width, label=bar_labels[3],
color=color4, edgecolor='black', linewidth=3,zorder=10)
x_positions = np.arange(len(x_values))
axs[2].set_xticks(x_positions, x_values, fontsize=font+20)
axs[2].text(-0.3,0.405, '(c)', fontdict={'family': 'times new roman', 'size':
font+33}, ha='center', va='center')
axs[2].set_ylabel("This is Y",fontsize=font+18)
lines, labels = fig.axes[0].get_legend_handles_labels()

legend = fig.legend( lines, labels,
```

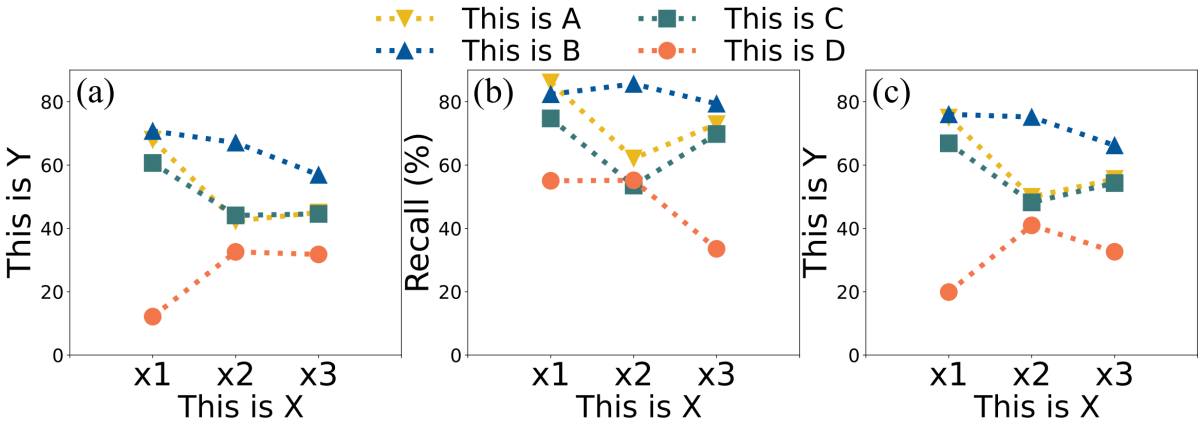
```
            loc='upper center',ncol=4,
framealpha=1,fontsize=font+20,frameon=False
)
legend.set_bbox_to_anchor((0.515, 1.132))

axs[0].set_ylim(37000000,42000000)
axs[1].set_ylim(35,50)
axs[2].set_ylim(0.25,0.42)

# 调整布局，以防止子图之间的重叠

plt.tight_layout()
fig.savefig("model2.pdf", format="pdf", bbox_extra_artists=
(legend,),bbox_inches="tight")
# 显示图形
plt.show()
```



图来源(USENIX ATC'24)　配色方案：

```
color1 = '#FAC110'
color2 = '#03569A'
color3 = '#60C6C8'
color4 = '#F3764A'
```

Case3:三子图折线图




```
import matplotlib.pyplot as plt
import numpy as np
font = 24
plt.rc('ytick', labelsize=font-2)

# 创建子图
fig, axs = plt.subplots(1, 3, figsize=(24, 6.1),sharex = True)
```

```
x_axis = ['','x1','x2','x3',''] # x轴坐标 为了像论文里横坐标刻度和Y轴、图右边界保持一定距离，曲线救国横坐标两边插个空
y_axis = [0,20,40,60,80,100]

markers = ['v', '^','s','o']
colors = ["#EAB81D", "#03569A","#397677","#f3764a"] # 黄 红 蓝
line_styles=['dotted','dotted','dotted','dotted']
max_data = 0
min_data = 100

#ob
data1=[0.679957538,0.423406689,0.450313362]
data2=[0.707521015,0.67085179,0.569129676]
data3=[0.606680313,0.441117913,0.44578232]
data4=[0.121492852,0.325912585,0.317859635]

data1 = [idx * 100 for idx in data1]
data2 = [idx * 100 for idx in data2]
data3 = [idx * 100 for idx in data3]
data4 = [idx * 100 for idx in data4]


max_data = max(max(data1),max_data,max(data2),max(data3),max(data4))
min_data = min(min(data1),min_data,min(data2),min(data3),min(data4))
print(min_data)

data = {
    'This is A': data1,
    'This is B': data2,
    'This is C': data3,
    'This is D': data4
}

for i, (line_name, y_values) in enumerate(data.items()):
    x_values = np.arange(len(y_values))
    axs[0].plot(x_values+1, y_values, marker=markers[i], label=line_name,
markersize=20, linewidth=6, color=colors[i],linestyle=line_styles[i])

x_position = np.arange(len(x_axis))
axs[0].set_xticks(x_position,x_axis,fontsize=font+14)
axs[0].set_ylim(0, 100)
axs[0].set_ylabel("This is Y",fontsize=font+14)
axs[0].text(0.31,82.5, '(a)', fontdict={'family': 'times new roman', 'size':
font+18}, ha='center', va='center')
at1=axs[0].text(2.065,-17, 'This is X', va='center',
ha='center',fontsize=font+12)


#ob
data1=[0.861105263,0.620974244,0.729313287]
data2=[0.823703704,0.856273063,0.79382716]
data3=[0.747348901,0.535341201,0.698044097]
data4=[0.550366324,0.551837417,0.335526316]


data1 = [idx * 100 for idx in data1]
```

```
data2 = [idx * 100 for idx in data2]
data3 = [idx * 100 for idx in data3]
data4 = [idx * 100 for idx in data4]
max_data = max(max(data1),max_data,max(data2),max(data3),max(data4))
min_data = min(min(data1),min_data,min(data2),min(data3),min(data4))
data = {
    'This is A': data1,
    'This is B': data2,
    'This is C': data3,
    'This is D': data4
}

print(min_data)

for i, (line_name, y_values) in enumerate(data.items()):
    x_values = np.arange(len(y_values))
    axs[1].plot(x_values+1, y_values, marker=markers[i], label=line_name,
markersize=20, linewidth=6, color=colors[i],linestyle=line_styles[i])

x_position = np.arange(len(x_axis))
axs[1].set_xticks(x_position,x_axis,fontsize=font+14)
axs[1].set_ylim(0, 100)
axs[1].set_ylabel("Recall (%)",fontsize=font+14)
# axs[1].legend(loc="upper right", bbox_to_anchor=(0.9, 1.02), fontsize=30,
ncol=4, labelspacing=0.4, handletextpad=0.02, frameon=False)
axs[1].text(0.31,82.5, '(b)', fontdict={'family': 'times new roman', 'size':
font+18}, ha='center', va='center')
at2=axs[1].text(2.065,-17, 'This is X', va='center',
ha='center',fontsize=font+12)

#ob
data1=[0.750049336,0.499694765,0.556074022]
data2=[0.760208571,0.751764381,0.662255416]
data3=[0.668729646,0.482154716,0.543203692]
data4=[0.198943208,0.409625039,0.326210219]

data1 = [idx * 100 for idx in data1]
data2 = [idx * 100 for idx in data2]
data3 = [idx * 100 for idx in data3]
data4 = [idx * 100 for idx in data4]
max_data = max(max(data1),max_data,max(data2),max(data3),max(data4))
min_data = min(min(data1),min_data,min(data2),min(data3),min(data4))
data = {
    'This is A': data1,
    'This is B': data2,
    'This is C': data3,
    'This is D': data4
}


for i, (line_name, y_values) in enumerate(data.items()):
    x_values = np.arange(len(y_values))
    axs[2].plot(x_values+1, y_values, marker=markers[i], label=line_name,
markersize=20, linewidth=6, color=colors[i],linestyle=line_styles[i])

x_position = np.arange(len(x_axis))
```

```
axs[2].set_xticks(x_position,x_axis,fontsize=font+14)
axs[2].set_ylim(0, 100)
axs[2].set_ylabel("This is Y",fontsize=font+14)
print(min_data)
axs[2].text(0.31,82.5, '(c)', fontdict={'family': 'times new roman', 'size':
font+18}, ha='center', va='center')
at3=axs[2].text(2.065,-17, 'This is X', va='center',
ha='center',fontsize=font+12)
low = max(0,int(min_data/10)*10-10)
height = int(max_data / 10) * 10 + 10

print(height)
print(low)
y_values = []
for i in range(int((height-low)/10)+1):
    if i%2 == 0:
        y_values.append(int(low+10*i))
print(len(y_values))
print(y_values)
y_pos = np.arange(len(y_values))

axs[0].set_yticks(y_values)
axs[1].set_yticks(y_values)
axs[2].set_yticks(y_values)

print(low)
axs[0].set_ylim(low,height)
axs[1].set_ylim(low,height)
axs[2].set_ylim(low,height)


lines, labels = fig.axes[0].get_legend_handles_labels()
legend = fig.legend( lines, labels,
            loc='upper center',ncol=2,
framealpha=1,fontsize=font+10,frameon=False,labelspacing=0.15,handletextpad=1
)
legend.set_bbox_to_anchor((0.42, 1.212))

plt.savefig("model3.pdf", format="pdf",bbox_extra_artists=
(legend,at1,at2,at3,),bbox_inches="tight")
plt.show()
```