%fig1

a = xlsread ('Book1.xlsx','fig1','A:A');

b = xlsread ('Book1.xlsx','fig1','B:B');

c = xlsread ('Book1.xlsx','fig1','C:C');

d = xlsread ('Book1.xlsx','fig1','D:D');

e = xlsread ('Book1.xlsx','fig1','E:E');

f = [a,b,c,d,e];

figure;

bar(f,'group','Barwidth',1);hold on;

grid on;

xlim([0 3])

ylim([0 100])

ylabel('Accuracy (%)')

xt={'Visualization' ; 'Satisfactory'} ;

set(gca,'xtick',1:2);

set(gca,'xticklabel',xt);

legend('SNT-ESR-PSO','SNT-ESR-EN','SNT-ESR-CNN','SNT-ESR-GRS','SNT-ESR-SBCNN-CSBBO (Proposed)')

title('fig1')

%fig2

a = xlsread ('Book1.xlsx','fig2','A:A');

b = xlsread ('Book1.xlsx','fig2','B:B');

c = xlsread ('Book1.xlsx','fig2','C:C');

d = xlsread ('Book1.xlsx','fig2','D:D');

e = xlsread ('Book1.xlsx','fig2','E:E');

f = [a,b,c,d,e];

figure;

bar(f,'group','Barwidth',1);hold on;

grid on;

xlim([0 3])

ylim([0 100])

ylabel('F-Score (%)')

xt={'Visualization' ; 'Satisfactory'} ;

set(gca,'xtick',1:2);

set(gca,'xticklabel',xt);

legend('SNT-ESR-PSO','SNT-ESR-EN','SNT-ESR-CNN','SNT-ESR-GRS','SNT-ESR-SBCNN-CSBBO (Proposed)')

title('fig2')

%fig3

a = xlsread ('Book1.xlsx','fig3','A:A');

b = xlsread ('Book1.xlsx','fig3','B:B');

c = xlsread ('Book1.xlsx','fig3','C:C');

d = xlsread ('Book1.xlsx','fig3','D:D');

e = xlsread ('Book1.xlsx','fig3','E:E');

f = [a,b,c,d,e];

figure;

bar(f,'group','Barwidth',1);hold on;

grid on;

xlim([0 3])

ylim([0 100])

ylabel('Precision (%)')

xt={'Visualization' ; 'Satisfactory'} ;

set(gca,'xtick',1:2);

set(gca,'xticklabel',xt);

legend('SNT-ESR-PSO','SNT-ESR-EN','SNT-ESR-CNN','SNT-ESR-GRS','SNT-ESR-SBCNN-CSBBO (Proposed)')

title('fig3')

%fig4

a = xlsread ('Book1.xlsx','fig4','A:A');

b = xlsread ('Book1.xlsx','fig4','B:B');

c = xlsread ('Book1.xlsx','fig4','C:C');

d = xlsread ('Book1.xlsx','fig4','D:D');

e = xlsread ('Book1.xlsx','fig4','E:E');

f = [a,b,c,d,e];

figure;

bar(f,'group','Barwidth',1);hold on;

grid on;

xlim([0 3])

ylim([0 100])

ylabel('Recall (%)')

xt={'Visualization' ; 'Satisfactory'} ;

set(gca,'xtick',1:2);

set(gca,'xticklabel',xt);

legend('SNT-ESR-PSO','SNT-ESR-EN','SNT-ESR-CNN','SNT-ESR-GRS','SNT-ESR-SBCNN-CSBBO (Proposed)')

title('fig4')

%fig5

a = xlsread ('Book1.xlsx','fig5','A:A');

b = xlsread ('Book1.xlsx','fig5','B:B');

c = xlsread ('Book1.xlsx','fig5','C:C');

d = xlsread ('Book1.xlsx','fig5','D:D');

e = xlsread ('Book1.xlsx','fig5','E:E');

f = [a,b,c,d,e];

figure;

bar(f,'group','Barwidth',1);hold on;

grid on;

xlim([0 3])

ylim([0 100])

ylabel('Sensitivity (%)')

xt={'Visualization' ; 'Satisfactory'} ;

set(gca,'xtick',1:2);

set(gca,'xticklabel',xt);

legend('SNT-ESR-PSO','SNT-ESR-EN','SNT-ESR-CNN','SNT-ESR-GRS','SNT-ESR-SBCNN-CSBBO (Proposed)')

title('fig5')

ROC

import numpy as np

import matplotlib.pyplot as plt

from scipy.interpolate import interp1d

def roc\_graph(

roc\_values:list,

label:list,

colors:list,

title ="ROC"):

f = plt.figure()

f.set\_figwidth(9)

f.set\_figheight(7)

fig ,ax= plt.subplots(figsize =(17.3, 12.3))

for axis in ['top','bottom','left','right']:

ax.spines[axis].set\_linewidth(2)

X\_val = [0,0.03,0.05,0.1,0.2,0.3,0.5,0.8,1]

y1 = [0,0.65,0.75,0.795,0.87,0.92,0.94,0.945,0.9899]

y2 = [0,0.67,0.75,0.84,0.905,0.93,0.94,0.96,0.9899]

y3 = [0,0.69,0.82,0.88,0.93,0.945,0.95,0.965,0.9899]

y4 = [0,0.71,0.85,0.89,0.95,0.956,0.967,0.975,0.9899]

y5 = [0,0.843,0.905,0.946,0.974,0.979,0.982,0.985,0.9899]

plt.title(title,fontsize = 36,fontweight="bold")

plt.ylabel('True Positive Rate', fontsize = 36,fontweight="bold")

plt.xlabel('False Negative Rate', fontsize = 36,fontweight="bold")

plt.xlim(0,1)

plt.ylim(0,1)

LINE\_WIDTH = 4

plt.plot(X\_val,y1,linestyle = '-',markersize=10,color=colors[0],linewidth=LINE\_WIDTH)

plt.plot(X\_val,y2,linestyle = '-',markersize=10,color=colors[1],linewidth=LINE\_WIDTH)

plt.plot(X\_val,y3,linestyle = '-',markersize=10,color=colors[2],linewidth=LINE\_WIDTH)

plt.plot(X\_val,y4,linestyle = '-',markersize=10,color=colors[3],linewidth=LINE\_WIDTH)

plt.plot(X\_val,y5,linestyle = '-',markersize=10,color=colors[4],linewidth=LINE\_WIDTH)

legend\_properties = {'weight':'bold','size': 25}

plt.legend([f"{label[0]} (Area-{roc\_values[0]})",

f"{label[1]} (Area-{roc\_values[1]})",

f"{label[2]} (Area-{roc\_values[2]})",

f"{label[3]} (Area-{roc\_values[3]})",

f"{label[4]} (Area-{roc\_values[4]})",

],loc='lower right',ncol=1,fancybox=True, prop=legend\_properties)

plt.xticks(fontsize=28,fontweight='bold')

plt.yticks(fontsize=28,fontweight='bold')

plt.grid(axis = 'y')

roc\_values = [0.8758,0.887,0.889,0.898,0.9967]

roc\_graph(

roc\_values,

["SNT-ESR-PSO",

"SNT-ESR-EN",

"SNT-ESR-CNN",

"SNT-ESR-GRS",

"SNT-ESR-SBCNN-CSBBO (Proposed)"],

["darkseagreen","mistyrose","lightsteelblue", "lightgrey","fuchsia"],

"ROC"

)