電腦輔助檢測與診斷作業

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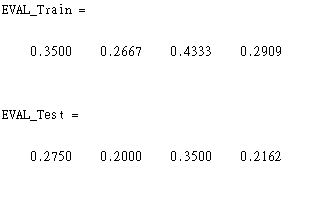
B10521141 蔡昕頤





rand('seed', 2)

GRNN



GRNN

clear all;close all;

tempa=imread('grass.bmp');

temp=tempa(:,:,1:3)

figure;imshow(temp);

temp1=double(rgb2gray(temp));

[m, n]=size(temp1);

figure;imshow(temp1,[]);

%%%%%%%%%%%%%%% Image Generation Parameters

width = 64; height=64;numberOfImage=200;

%%%%%%%%%%%%%%%%%%%%%%

Partition1=ceil(0.6\*numberOfImage);

Partition2=ceil(0.2\*numberOfImage);

Partition3=ceil(0.2\*numberOfImage);

%%%%%%%%%%%%%%%%%%%%%%%

rand('seed', 2);

Feature1=[];

for i=1:numberOfImage

a=ceil(rand\*(m-height));

b=ceil(rand\*(n-width));

hold on; plot([b b b+width b+width b],[a a+height a+height a a],'r','LineWidth', 3);

temp2=temp1(a:a+height-1, b:b+width-1);

feature=gfeature(double(temp2),'0');

Feature1=[Feature1, feature];

end

%%%%%%%%%%%%%%%%%%%% Start the 2nd Image\*\*\*\*\*\*\*\*\*\*

tempa=imread('wood.bmp');

temp=tempa(:,:,1:3)

figure;imshow(temp);

temp1=double(rgb2gray(temp));

[m, n]=size(temp1);

figure;imshow(temp1,[]);

Feature2=[];

for i=1:numberOfImage

a=ceil(rand\*(m-height));

b=ceil(rand\*(n-width));

hold on; plot([b b b+width b+width b],[a a+height a+height a a],'b','LineWidth', 3);

temp2=temp1(a:a+height-1, b:b+width-1);

feature=gfeature(double(temp2),'0');

Feature2=[Feature2, feature];

end

% End Feature Extraction

P1=Feature1(:,1:Partition1);

P2=Feature2(:,1:Partition1);

P\_Tr=[P1 P2];

T\_Tr=[zeros(1,Partition1) ones(1, Partition1)];

P1=Feature1(:,Partition1+1:Partition1+Partition2);

P2=Feature2(:,Partition1+1:Partition1+Partition2);

P\_Te=[P1 P2];

T\_Te=[zeros(1,numberOfImage-(Partition1+Partition3)), ones(1,numberOfImage-(Partition1+Partition3))];

P1=Feature1(:,Partition1+Partition2+1:numberOfImage);

P2=Feature2(:,Partition1+Partition2+1:numberOfImage);

P\_Vali=[P1 P2];

T\_Vali=[zeros(1,numberOfImage-(Partition1+Partition2)), ones(1,numberOfImage-(Partition1+Partition2))];

%%%%%% Train GRNN

%

pause

%

A\_Tr=[];

A\_Te=[];

A\_Vali=[];

x=[0.1:0.1:10];

for Sigma=0.1:0.1:10

net=newgrnn(P\_Tr,T\_Tr,Sigma);

out=sim(net,P\_Tr);

accuracyTr=(length(T\_Tr)-sum(abs(T\_Tr-out)>0.5))/length(T\_Tr);

A\_Tr=[A\_Tr accuracyTr];

out=sim(net,P\_Te);

accuracyTe=(length(T\_Te)-sum(abs(T\_Te-out)>0.5))/length(T\_Te);

A\_Te=[A\_Te accuracyTe];

out=sim(net,P\_Vali);

accuracyVali=(length(T\_Vali)-sum(abs(T\_Vali-out)>0.5))/length(T\_Vali);

A\_Vali=[A\_Vali accuracyVali];

end

figure;plot(x, A\_Tr,'b-');hold on;plot(x, A\_Te,'r');plot(x, A\_Vali,'k');plot(x, A\_Tr+A\_Te+A\_Vali,'g');

%%

pause

%%

%­pºâAccuracy, Sensitivity, Specificity, F-measure

Sigma=4;

net=newgrnn(P\_Tr,T\_Tr,Sigma);

save('ImageClassification.mat');

load('ImageClassification.mat', 'net','height','width');

out\_Tr=sim(net,P\_Tr);

out\_Te=sim(net,P\_Te);

out\_Vali=sim(net,P\_Vali);

EVAL\_Train = Evaluate(T\_Tr,out\_Tr)

EVAL\_Test = Evaluate(T\_Te,out\_Te)

EVAL\_Vali = Evaluate(T\_Te,out\_Vali)

%%

pause

%%

%%Test Grnn

tempa=imread('grass.bmp');

temp=tempa(:,:,1:3)

temp1=double(rgb2gray(temp));

tempb=imread('wood.bmp');

temp=tempb(:,:,1:3)

temp2=double(rgb2gray(temp));

I=[temp1 temp1;temp1 temp1;temp2 temp2;temp2 temp2];

figure;imshow(I,[])

while pause

disp('Select a test point')

[b,a]=ginput(1);

b=round(b);a=round(a);

N1=I(a:a+height-1,b:b+width-1);

F=gfeature(double(N1),'0');

out1=sim(net,F);

hold on;

if out1 > 0.5

plot([b b b+width b+width b],[a a+height a+height a a], 'b:','LineWidth', 3)

else

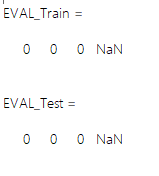
plot([b b b+width b+width b],[a a+height a+height a a],'r:','LineWidth',3)

end

end

BPNN

rng(2)



BPNN

clear all;close all;

temp=imread('grass.bmp');

figure;imshow(temp);

temp1=double(rgb2gray(temp));

[m, n]=size(temp1);

figure;imshow(temp1,[]);

%%%%%%%%%%%%%%% Image Generation Parameters

width = 64; height=64;numberOfImage=100;

%%%%%%%%%%%%%%%%%%%%%%

Partition1=ceil(0.6\*numberOfImage);

Partition2=ceil(0.2\*numberOfImage);

Partition3=ceil(0.2\*numberOfImage);

%%%%%%%%%%%%%%%%%%%%%%%

rng(2);

Feature1=[];

for i=1:numberOfImage

a=ceil(rand\*(m-height));

b=ceil(rand\*(n-width));

hold on; plot([b b b+width b+width b],[a a+height a+height a a],'r','LineWidth', 3);

temp4=temp1(a:a+height-1, b:b+width-1);

feature=gfeature(double(temp4),'0');

Feature1=[Feature1, feature];

end

%%%%%%%%%%%%%%%%%%%% Start the 2nd Image\*\*\*\*\*\*\*\*\*\*

temp=imread('wood.bmp');

figure;imshow(temp);

temp1=double(rgb2gray(temp));

[m, n]=size(temp1);

figure;imshow(temp1,[]);

Feature2=[];

for i=1:numberOfImage

a=ceil(rand\*(m-height));

b=ceil(rand\*(n-width));

hold on; plot([b b b+width b+width b],[a a+height a+height a a],'b','LineWidth', 3);

temp4=temp1(a:a+height-1, b:b+width-1);

feature=gfeature(double(temp4),'0');

Feature2=[Feature2, feature];

end

% End Feature Extraction

P1=Feature1(:,1:Partition1);

P2=Feature2(:,1:Partition1);

P\_Tr=[P1 P2];

T\_Tr=[zeros(1,Partition1) ones(1, Partition1)];

P1=Feature1(:,Partition1+1:Partition1+Partition2);

P2=Feature2(:,Partition1+1:Partition1+Partition2);

P\_Te=[P1 P2];

T\_Te=[zeros(1,numberOfImage-(Partition1+Partition3)), ones(1,numberOfImage-(Partition1+Partition3))];

P1=Feature1(:,Partition1+Partition2+1:numberOfImage);

P2=Feature2(:,Partition1+Partition2+1:numberOfImage);

P\_Vali=[P1 P2];

T\_Vali=[zeros(1,numberOfImage-(Partition1+Partition2)), ones(1,numberOfImage-(Partition1+Partition2))];

%

pause

%

E\_Tr=[];

E\_Te=[];

E\_Vali=[];

x=[1:1:40];

for node=1:1:40

net=newff(P\_Tr,T\_Tr,node);

out\_Tr=sim(net,P\_Tr);

err\_Tr=immse(T\_Tr,out\_Tr);

E\_Tr=[E\_Tr err\_Tr];

out\_Te=sim(net,P\_Te);

err\_Te=immse(T\_Te,out\_Te);

E\_Te=[E\_Te err\_Te];

out\_Vali=sim(net,P\_Vali);

err\_Vail=immse(T\_Te,out\_Te);

E\_Vali=[E\_Vali err\_Vail];

end

figure;plot(x, E\_Tr,'b-');hold on;plot(x, E\_Te,'r');plot(x, E\_Vali,'k');plot(x, E\_Tr+E\_Te+E\_Vali,'g');

%%

pause

%%

%node=2®É¡Aerror³Ì§C

node=2;

net=newff(P\_Tr,T\_Tr,node);

out\_Tr=sim(net,P\_Tr);

out\_Te=sim(net,P\_Te);

out\_Vali=sim(net,P\_Vali);

EVAL\_Train = Evaluate(T\_Tr,out\_Tr)

EVAL\_Test = Evaluate(T\_Te,out\_Te)

EVAL\_Vali = Evaluate(T\_Te,out\_Vali)