HC_fcm_test

HC_fcm:Horizontal Collaborative fcm by liyang @BNU Math 315
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Contents

清空环境变量和命令窗

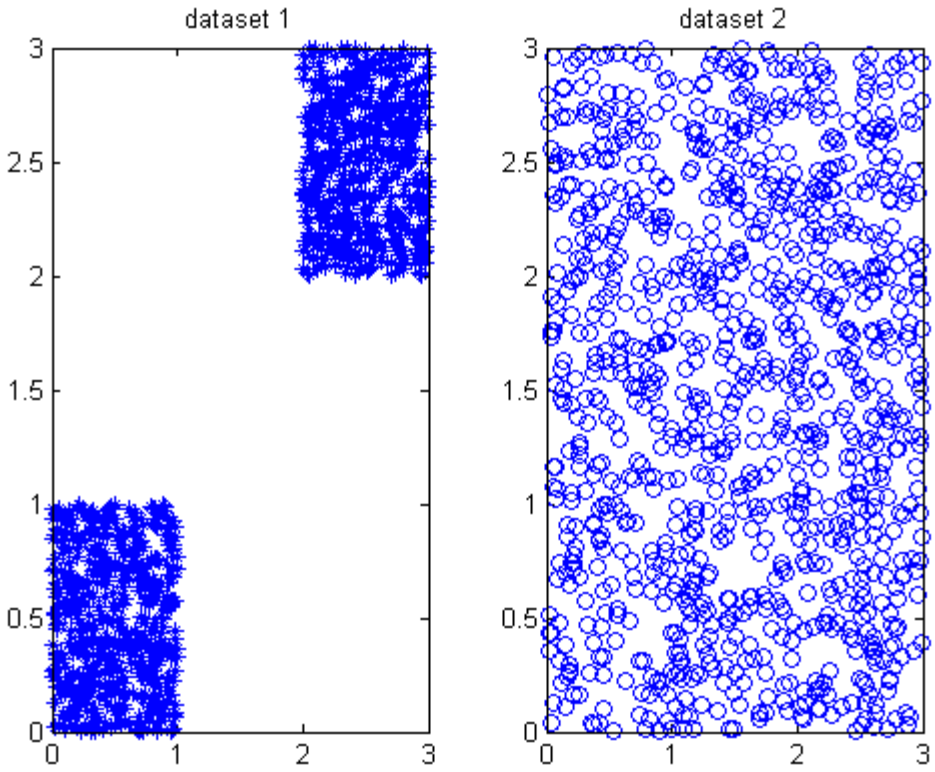
```
clear;
clc;
```

随机生成的数据

```
c = 2;
X = cell(1,2);
num = 500;
X{1} = [rand(num,2);(3-2)*rand(num,2)+2];
X{2} = 3*rand(2*num,2);
```

数据可视化

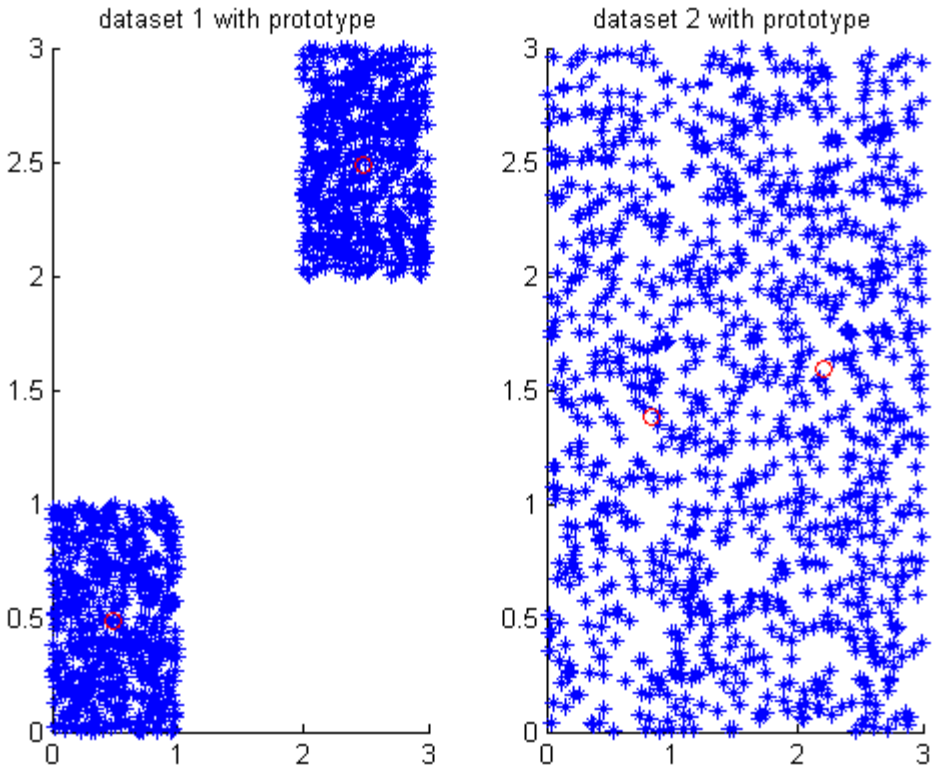
```
figure;
subplot(1,2,1);
plot(X{1}(:,1),X{1}(:,2),'*');
title('dataset 1');
subplot(1,2,2);
plot(X{2}(:,1),X{2}(:,2),'o');
title('dataset 2');
```

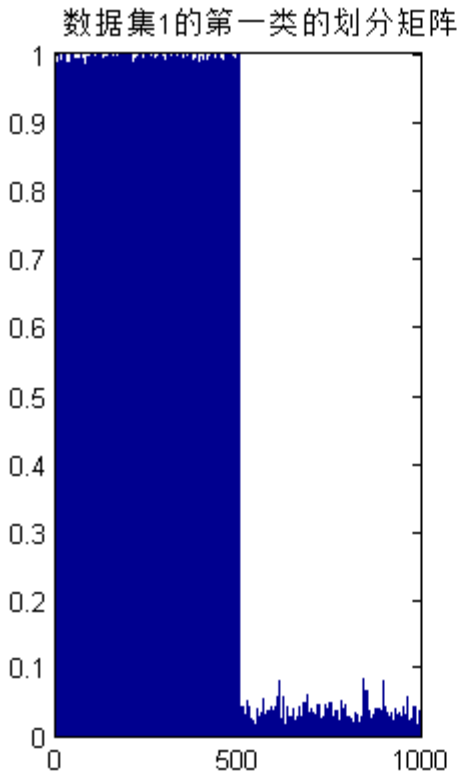


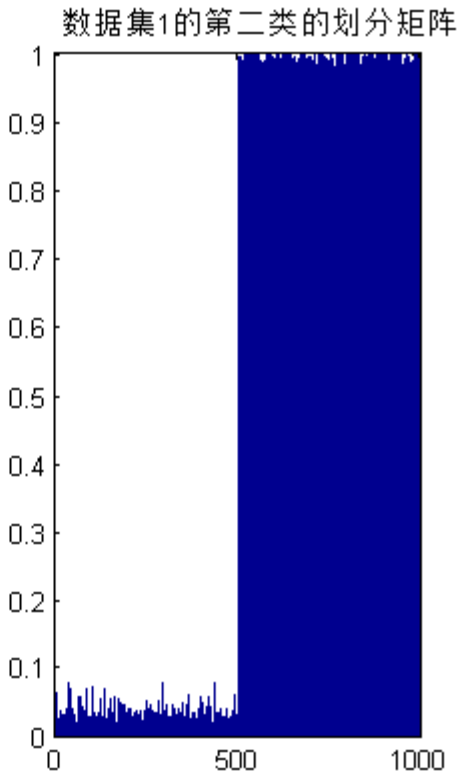
HC_fcm:Horizontal Collaborative fcm with alpha 协作矩阵都为0

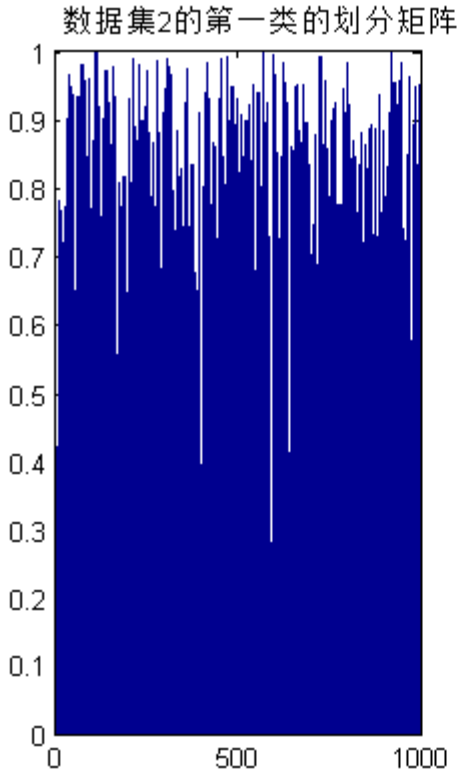
```
% alpha 协作矩阵都为0
alpha = zeros(2,2);
[U,V] = HC_fcm(X,c,alpha);

figure;
subplot(1,2,1);
hold on;
plot(X{1}(:,1),X{1}(:,2),'*');
plot(V{1}(:,1),V{1}(:,2),'ro');
title('dataset 1 with prototype');
hold off;
subplot(1,2,2);
hold on;
plot(X{2}(:,1),X{2}(:,2),'*');
plot(V{2}(:,1),V{2}(:,2),'ro');
title('dataset 2 with prototype');
hold off;

figure;
subplot(1,2,1);
bar(U{1}(1,:));
axis([0 2*num 0 1]);
title('数据集1的第一类的划分矩阵');
subplot(1,2,2);
bar(U{1}(2,:));
axis([0 2*num 0 1]);
title('数据集1的第二类的划分矩阵');

figure;
subplot(1,2,1);
bar(U{2}(1,:));
axis([0 2*num 0 1]);
title('数据集2的第一类的划分矩阵');
subplot(1,2,2);
bar(U{2}(2,:));
axis([0 2*num 0 1]);
title('数据集2的第二类的划分矩阵');

figure;
for run = 1:2*num
```

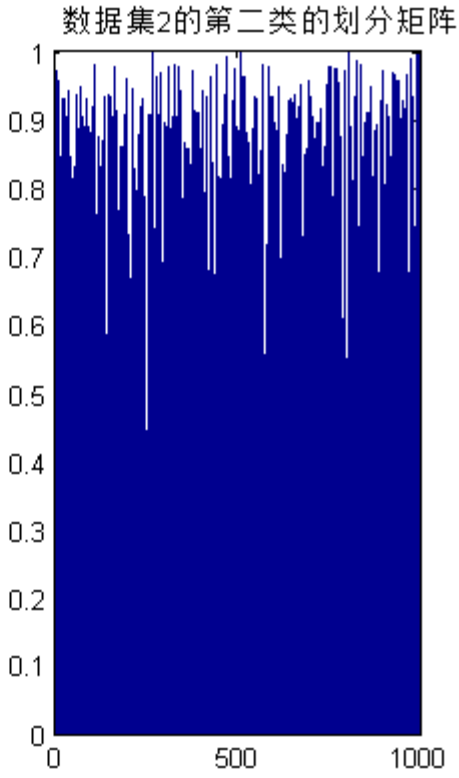
```
    plot3(X{1}(run,1),X{1}(run,2),U{1}(1,run),'*');
    hold on;
end
grid on;
title('data 1 第一类的划分矩阵3D');

figure;
for run = 1:2*num
    plot3(X{2}(run,1),X{2}(run,2),U{2}(1,run),'*');
    hold on;
end
title('data 2 第一类的划分矩阵3D');
grid on;
```

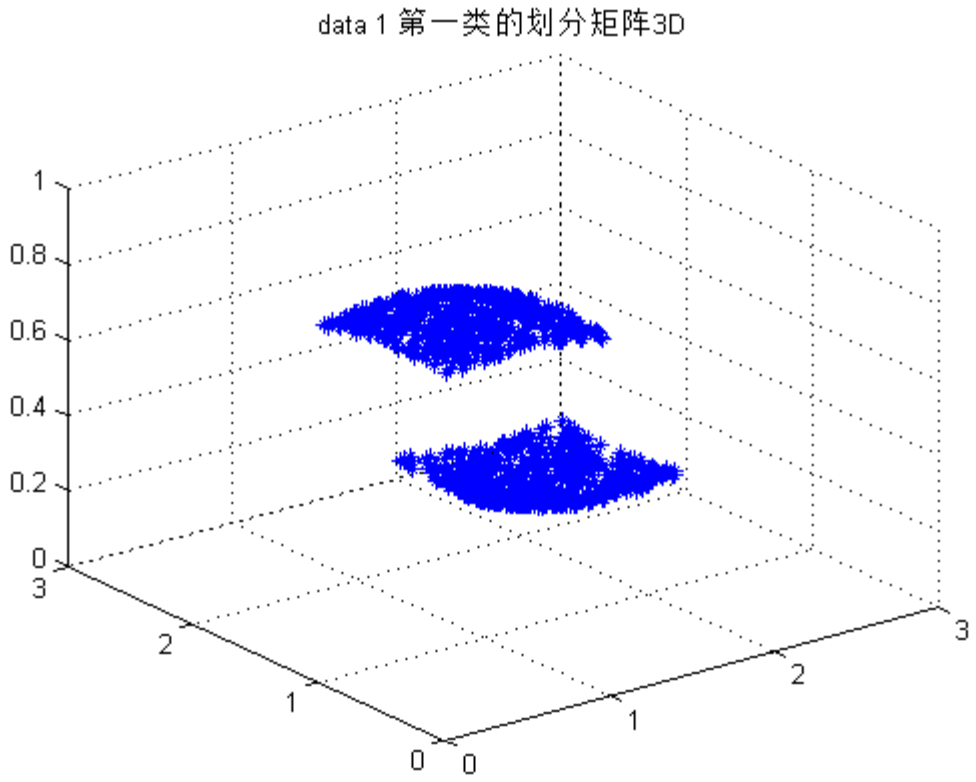


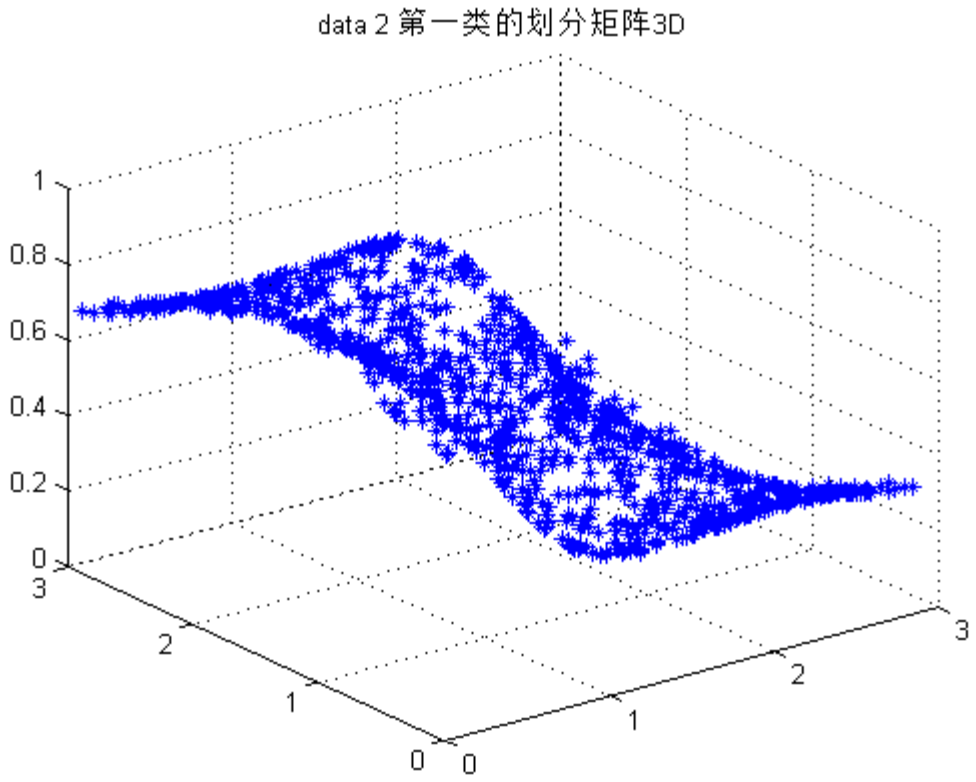

数据集1的第一类的划分矩阵
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
500
1000


数据集1的第二类的划分矩阵
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
500
1000


数据集2的第一类的划分矩阵
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
500
1000


数据集2的第二类的划分矩阵
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
500
1000

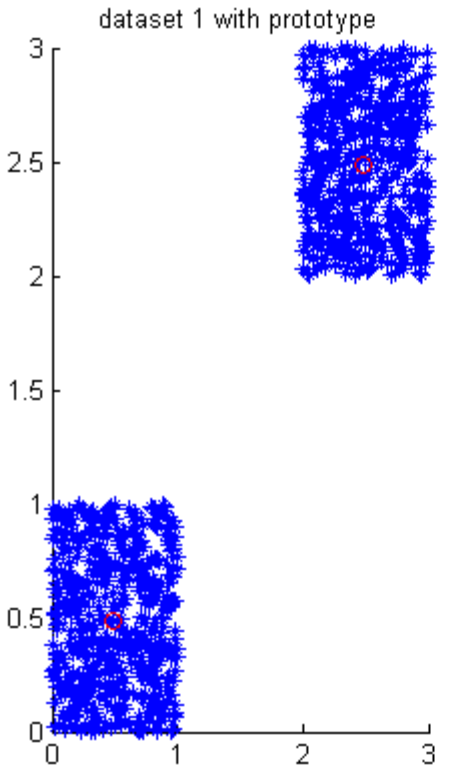


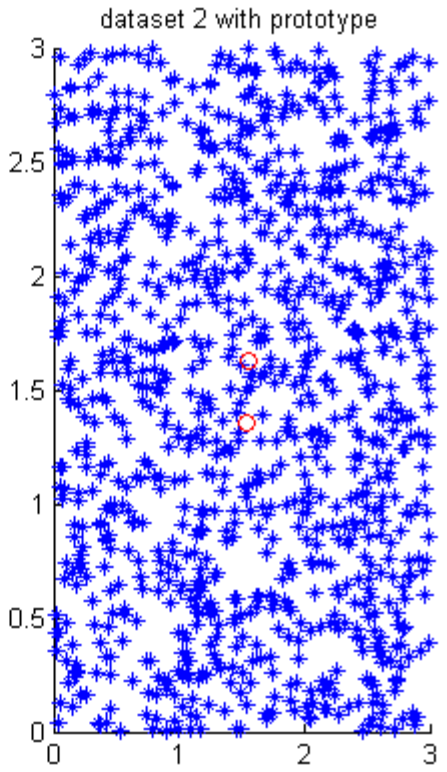


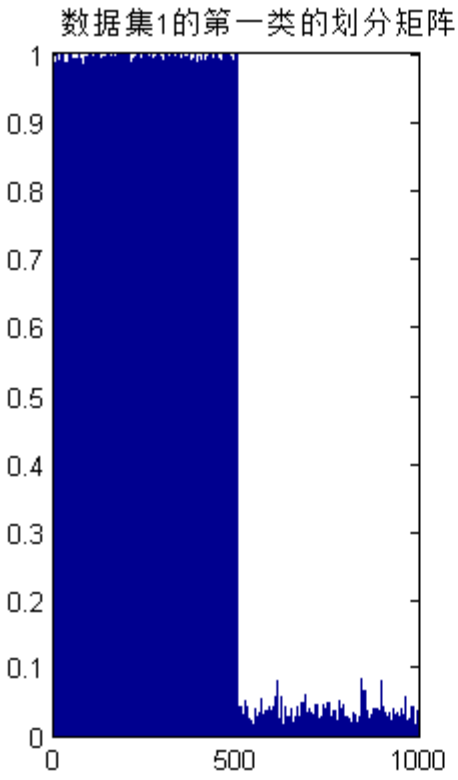
HC_fcm:Horizontal Collaborative fcm with alpha(2,1) ~= 0

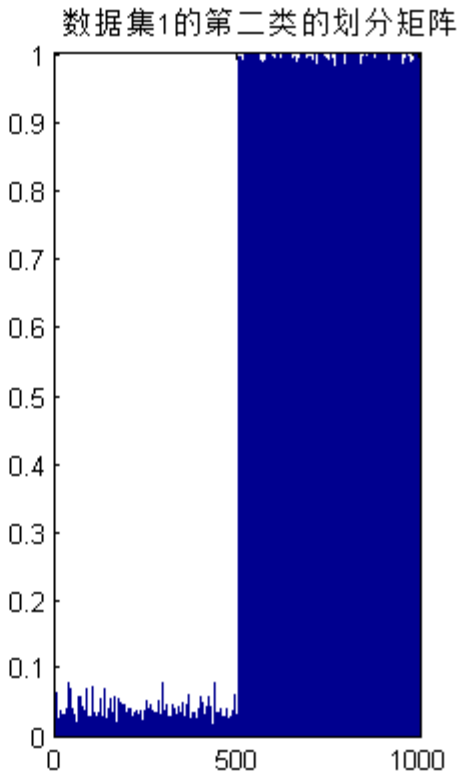
```
% alpha(2,1) ~= 0
alpha(2,1) = 0.6;
[U,V] = HC_fcm(X,c,alpha);

figure;
```

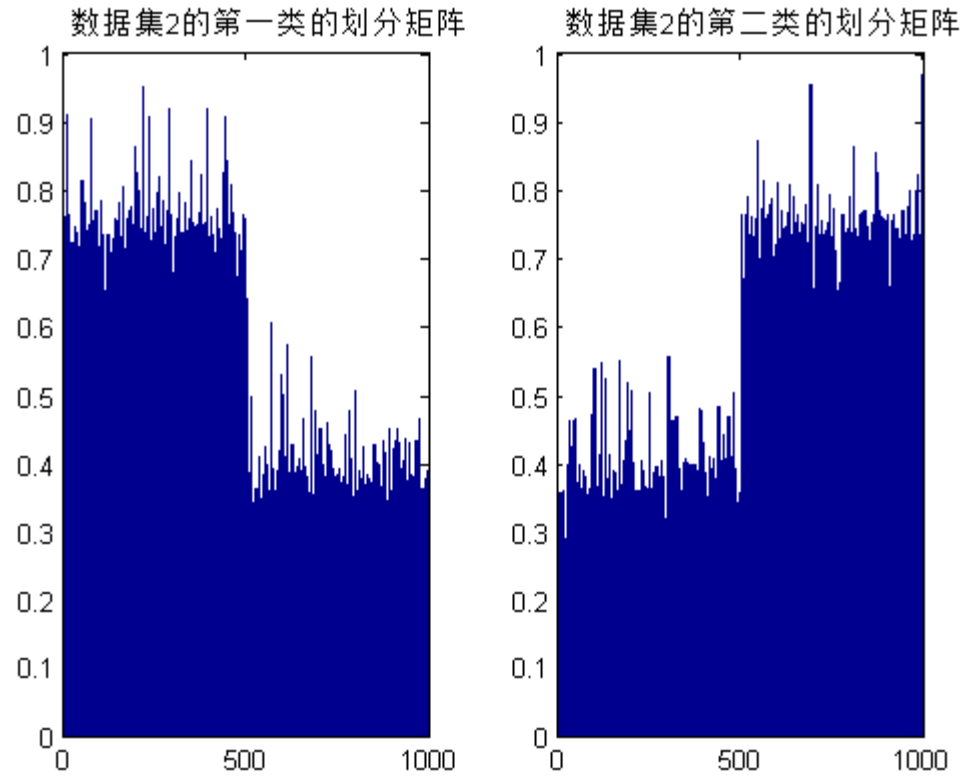
```
subplot(1,2,1);
hold on;
plot(X{1}(:,1),X{1}(:,2),'*');
plot(V{1}(:,1),V{1}(:,2),'ro');
title('dataset 1 with prototype');
hold off;
subplot(1,2,2);
hold on;
plot(X{2}(:,1),X{2}(:,2),'*');
plot(V{2}(:,1),V{2}(:,2),'ro');
title('dataset 2 with prototype');
hold off;

figure;
subplot(1,2,1);
bar(U{1}(1,:));
axis([0 2*num 0 1]);
title('数据集1的第一类的划分矩阵');
subplot(1,2,2);
bar(U{1}(2,:));
axis([0 2*num 0 1]);
title('数据集1的第二类的划分矩阵');

figure;
subplot(1,2,1);
bar(U{2}(1,:));
axis([0 2*num 0 1]);
title('数据集2的第一类的划分矩阵');
subplot(1,2,2);
bar(U{2}(2,:));
axis([0 2*num 0 1]);
title('数据集2的第二类的划分矩阵');

figure;
for run = 1:2*num
    plot3(X{1}(run,1),X{1}(run,2),U{1}(1,run),'*');
    hold on;
end
grid on;
title('data 1 第一类的划分矩阵3D');

figure;
for run = 1:2*num
    plot3(X{2}(run,1),X{2}(run,2),U{2}(1,run),'*');
    hold on;
end
title('data 2 第一类的划分矩阵3D');
grid on;
```

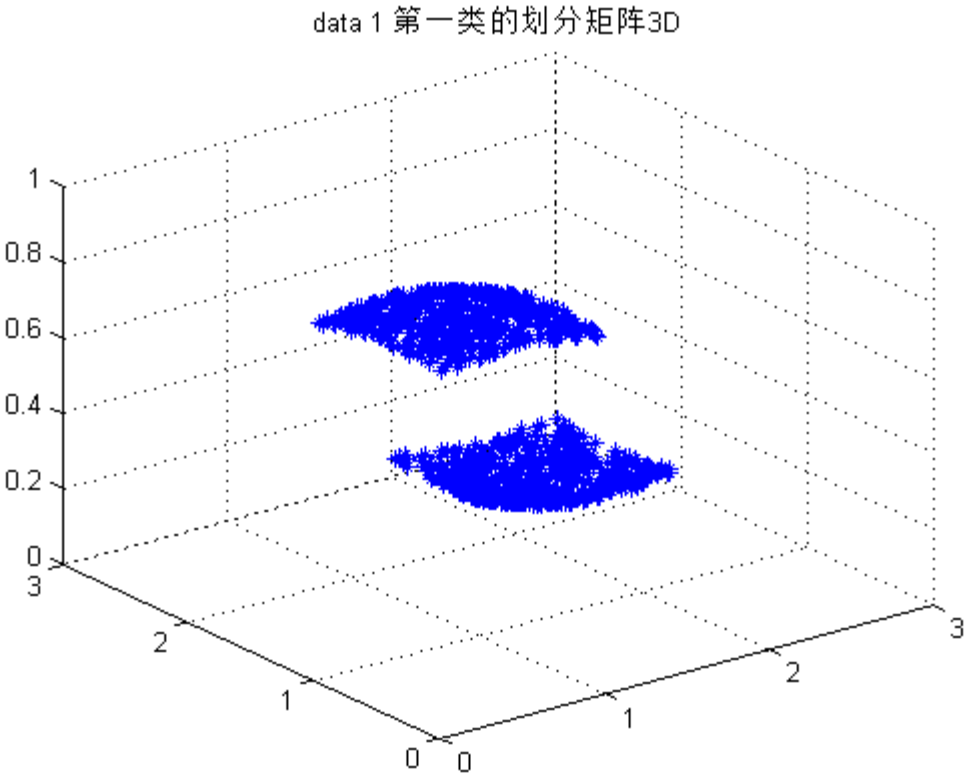

dataset 1 with prototype
3
2.5
2
1.5
1
0.5
0
0
1
2
3

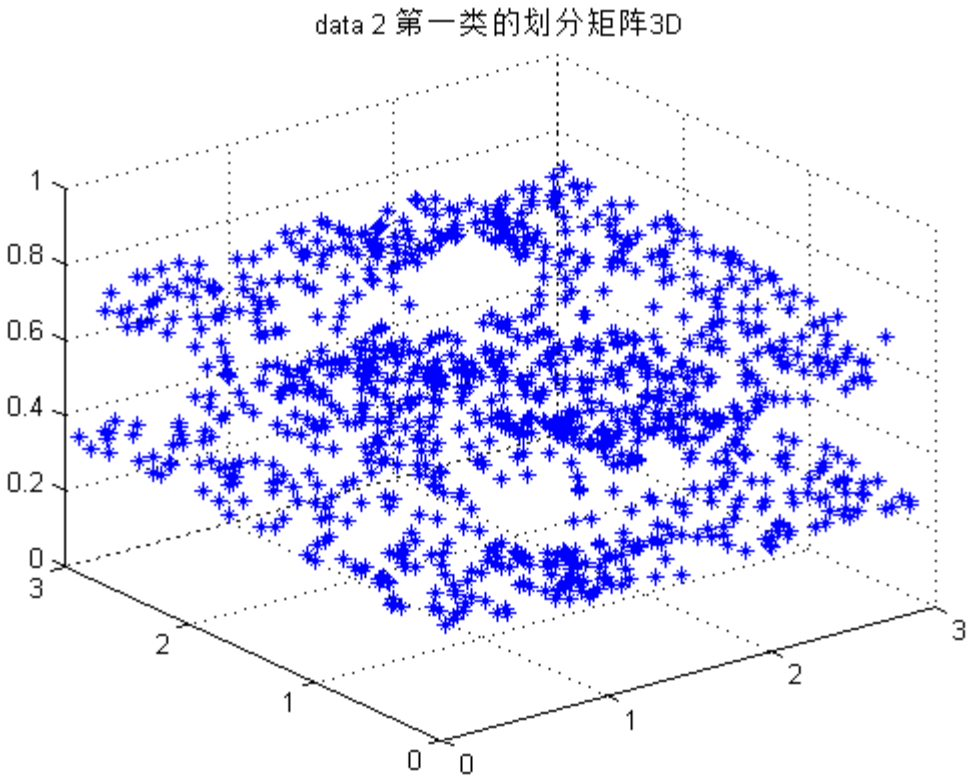

dataset 2 with prototype
3
2.5
2
1.5
1
0.5
0
0
1
2
3


数据集1的第一类的划分矩阵
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
500
1000


数据集1的第二类的划分矩阵
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
500
1000


数据集2的第一类的划分矩阵
数据集2的第二类的划分矩阵
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0
500
1000


data 1 第一类的划分矩阵3D
0
0.2
0.4
0.6
0.8
1
0
1
2
3
0
1
2
3



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