function [P,A,B,lamda,Jth\_T2,Jth\_SPE]=KPCA\_nomal(X,Y,c)

% clc

% clear all

% data=xlsread('nomal\_data.xlsx');

% Y=data(17,:);

% X=data(1:50,:);

%求均值

Y\_mean=mean(Y,2);

X\_mean=mean(X,2);

%求标准差

Y\_std = std(Y,0,2);

X\_std = std(X,0,2);

%数据标准化

[mY,nY]=size(Y);

[mX,nX]=size(X);

Y=(Y - repmat(Y\_mean,1,nY))./repmat(Y\_std,1,nY);

X=(X - repmat(X\_mean,1,nX))./repmat(X\_std,1,nX);

X = transpose(X);

ax=X;

[Nx]=size(ax,1);

mean\_X = mean(ax);

std\_X=std(ax);

ax=ax-mean\_X(ones(Nx,1),:);

std\_X(find(std\_X==0))=1;%数据预处理

ax=ax./std\_X(ones(Nx,1),:);

[N]=size(ax,1);

for i=1:N

for j=1:N

K(i,j)=exp(-norm(ax(i,:)-ax(j,:))^2/c);%求核矩阵

end

end

n1=ones(N,N);

N1=1/N\*n1;

Kp=K-N1\*K-K\*N1+N1\*K\*N1;

[u,s,v]=svd(Kp/N);

lamda=s;

P=v;

lamda=diag(lamda);

B=length(find(lamda>1e-10)); %求非零的特征值个数

%求主元个数

A=1;

while sum(lamda(1:A))/sum(lamda(1:B))<0.9

A=A+1;

end

% npc

%求特征空间有效维数

DimFS=1;

while sum(lamda(1:DimFS))/sum(lamda(1:B))<=0.99

DimFS=DimFS+1;

end

lamda=diag(lamda);

for i=1:B

% P(:,i)=P(:,i)/norm(P(:,i)\*s(i,i));

P(:,i)=P(:,i)/(norm(P(:,i))\*sqrt(N\*lamda(i,i)));

end

%T2,SPE控制线

Jth\_T2=A\*(N-1)\*(N+1)\*icdf('f',0.99,A,N-A)/(N\*(N-A));

for i=1:3

theta(i)=trace((lamda(A+1:DimFS,A+1:DimFS))^i);

end

h0=1-2\*theta(1)\*theta(3)/(3\*theta(2)^2);

ca=icdf('norm',0.99,0,1);

Jth\_SPE=theta(1)\*(ca\*sqrt(2\*theta(2)\*h0^2)/theta(1)+1+theta(2)\*h0\*(h0-1)/theta(1)^2)^(1/h0);