(1)diffusion map

t = 10000000

Code:

load('face.mat');

X = reshape(Y,[10304,33]);

X\_double = double(X);

W = zeros(33,33);

% t = 10000000;

t = 1000000;

for i = 1:33

for j = 1:33

W(i,j) = exp(-(norm(X\_double(:,i)-X\_double(:,j)))^2/t);

end

end

di = 1:33;

for i = 1:33

di(i) = sum(W(i,:));

end

D = diag(di);

I = eye(33);

L = inv(D)\*W - I;

[V,E] = eig(L); %v is eigenvector

V(:,2);

[B,In] = sort(V(:,2));

rr = 0;

% for i = In'

% image(Y(:,:,i));

% rr = rr + 1;

% title = sprintf('sort%d.png',rr);

% saveas(gcf,title);

% end

(2) MDS.

load('face.mat');

X = reshape(Y,[10304,33]);

X\_double = double(X);

D = zeros(33,33);

for i = 1:33

for j = 1:33

D(i,j) = (norm(X\_double(:,i)-X\_double(:,j)))^2;

end

end

H = eye(33) - ones(33)/33;

B = -H \* D \* H/2;

[V,E] = eig(B);

% eigenv = sort(diag(E),'descend');

% plot(eigenv,'\*');

Co = V(:,[1,2]) \* sqrt(E([1,2],[1,2]));

scatter(Co(:,1),Co(:,2));

(3)ISOMAP:

load('face.mat');

X = reshape(Y,[10304,33]);

X\_double = double(X);

D = zeros(33,33);

for i = 1:33

for j = 1:33

D(i,j) = norm(X\_double(:,i)-X\_double(:,j));

end

end

[Coor, RV, Neighbor]=isomapII(D, 'k', 5);

(4)LLE

load('face.mat');

X = reshape(Y,[10304,33]);

X\_double = double(X);

G = lle(X\_double,5,3);

% scatter(G(1,:),G(2,:));

[NEW, INDEX] = sort(G(2,:));