load ('USPS');

[coeff,score] = pca(A);

% for p=10

p=10;

D = score(:,1:p)\*coeff(:,1:p)' + ones(3000,1)\*mean(A);

D1 = reshape(D(1,:),16,16);

D2 = reshape(D(2,:),16,16);

figure;

imshow(D1');

figure;

imshow(D2');

error10=0;

for i=1:3000

a = norm(A(i,:)-D(i,:),2);

error10 = error10 + a;

end

% for p=50

p=50;

D = score(:,1:p)\*coeff(:,1:p)' + ones(3000,1)\*mean(A);

D1 = reshape(D(1,:),16,16);

D2 = reshape(D(2,:),16,16);

figure;

imshow(D1');

figure;

imshow(D2');

error50=0;

for i=1:3000

a = norm(A(i,:)-D(i,:),2);

error50 = error50 + a;

end

% for p=100

p=100;

D = score(:,1:p)\*coeff(:,1:p)' + ones(3000,1)\*mean(A);

D1 = reshape(D(1,:),16,16);

D2 = reshape(D(2,:),16,16);

figure;

imshow(D1');

figure;

imshow(D2');

error100=0;

for i=1:3000

a = norm(A(i,:)-D(i,:),2);

error100 = error100 + a;

end

% for p=200

p=200;

D = score(:,1:p)\*coeff(:,1:p)' + ones(3000,1)\*mean(A);

D1 = reshape(D(1,:),16,16);

D2 = reshape(D(2,:),16,16);

figure;

imshow(D1');

figure;

imshow(D2');

error200=0;

for i=1:3000

a = norm(A(i,:)-D(i,:),2);

error200 = error200 + a;

end

error = [error10, error50, error100, error200];

plot(error)

