

CBIR – Lab 8
PCA Features for facial recognition

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Dataset used (Yale Dataset) – http://vision.ucsd.edu/datasets/yale_face_dataset_original/yalefaces.zip

Q1)

MATLAB/OpenCV Code for extracting PCA Features based CBIR

Solution -

```
I = double(imread('subject1.gif'));
X = reshape(I, size(I,1)*size(I,2), 3);
coeff = pca(X);
fea=coeff(:);
imagefiles = dir('yalefaces/*.gif');
nfiles = length(imagefiles);
sim = zeros(1,nfiles);
for ii=1:nfiles
    currentfilename = strcat(int2str(ii), '.gif');
    cimage = double(imread(currentfilename));
    cX = reshape(cimage, size(cimage,1)*size(cimage,2), 3);
    ccoeff = pca(cX);
    cfea=ccoeff(:);
    sim(ii) = sqrt(sum((fea - cfea) .^ 2));
end
[ASorted, AIdx] = sort(sim);
smallestNElements = ASorted(1:6);
smallestNIdx = AIdx(1:6);
for ii=1:6
    imagename = strcat(int2str( smallestNIdx(ii)), '.gif');
    im = imread(imagename);
    subplot(3,2,ii), imshow(im);
end
```

Screenshot-



Q2) Extract PCA feature and show in table

```
imagefiles = dir('*.jpg');  
nfiles = length(imagefiles);  
for ii=1:nfiles  
    currentfilename = imagefiles(ii).name;  
    cimage = double(imread(currentfilename));  
    cX = reshape(I, size(I,1)*size(I,2),3);  
    ccoeff = pca(X);  
    cfea=coeff(:);  
    res = [ii,cfea];  
    dlmwrite('result.csv',res,'-append')  
end
```

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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1		1	0.508744	0.50682	0.530522	0.733327	-0.99937	-0.99937	-0.92319	0.790093	-0.93008										
2		2	0.538463	0.540242	0.592473	0.763898	-0.9909	-0.98769	-0.93341	0.719903	-0.97932										
3		3	0.509634	0.567329	0.573284	0.705218	-0.98828	-0.90395	-0.9965	0.705076	-0.96548										
4		1	0.560653	0.522406	0.575999	0.755845	-0.91952	-0.97892	-0.98107	0.7659	-0.96749										
5		2	0.559753	0.512896	0.541684	0.711015	-0.9915	-0.952	-0.93859	0.750316	-0.96887										
6		3	0.583273	0.509345	0.560842	0.769539	-0.92329	-0.94602	-0.98004	0.748208	-0.98265										
7		4	0.519443	0.556444	0.582275	0.707118	-0.98835	-0.91315	-0.90681	0.773831	-0.96744										
8		5	0.523435	0.536179	0.562299	0.737284	-0.94803	-0.98827	-0.99786	0.7001	-0.93829										
9		6	0.52401	0.593945	0.571248	0.797348	-0.95913	-0.94569	-0.93742	0.746725	-0.90898										
10		7	0.516742	0.517912	0.534911	0.740706	-0.96739	-0.97591	-0.9728	0.730732	-0.90525										
11		8	0.550029	0.54974	0.5007	0.747715	-0.97436	-0.91879	-0.93094	0.79808	-0.99697										
12		9	0.590141	0.565665	0.555788	0.70909	-0.99521	-0.94406	-0.91485	0.772388	-0.97851										
13		10	0.597318	0.537404	0.568424	0.727253	-0.96632	-0.91856	-0.99799	0.723603	-0.97331										
14		11	0.59537	0.518098	0.570483	0.711979	-0.96476	-0.93921	-0.9448	0.701629	-0.95897										
15		12	0.577636	0.585219	0.570049	0.793916	-0.94204	-0.9546	-0.97599	0.783274	-0.97322										
16		13	0.548229	0.57148	0.565237	0.711635	-0.98781	-0.99836	-0.9794	0.711101	-0.95769										
17		14	0.533909	0.536249	0.519922	0.737517	-0.90175	-0.97043	-0.93064	0.74663	-0.93443										
18		15	0.57709	0.571204	0.585695	0.76222	-0.99666	-0.95716	-0.96183	0.787338	-0.98712										
19		16	0.576107	0.556765	0.57601	0.731931	-0.91416	-0.99041	-0.92778	0.75415	-0.99108										
20		17	0.512547	0.587753	0.502107	0.75643	-0.9182	-0.96641	-0.92439	0.749812	-0.98929										
21		18	0.557829	0.5497	0.549854	0.737605	-0.99926	-0.91113	-0.91973	0.777566	-0.97655										
22		19	0.50185	0.564548	0.59401	0.724476	-0.95074	-0.95933	-0.96126	0.781662	-0.97321										
23		20	0.547832	0.544627	0.597612	0.736026	-0.91327	-0.93259	-0.99299	0.75596	-0.91164										
24		21	0.586953	0.546095	0.575098	0.713356	-0.90349	-0.95974	-0.95073	0.770665	-0.96307										

Ready

100%

(Complete result in result.csv)