

Assignment 4

Computer Vision - IT-524

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12 October 2012

1. Compare an image and its compressed version obtained by setting all the small eigenvalues to 0 (obtained using SVD of the image)

Code and Results

```
% Computer Vision (IT524)
% Assignment 4
% Compare an image and its compressed version obtained by setting all the
% small eigenvalues to 0 (obtained using SVD of the image)
%-----
% Created by: Milind Padalkar (201121015)
% Date: 12-10-2012
%-----

%% Function help
% Input    : 1. Compression ratio (default = 0.5)
%           2. Input image
% Output   : 1. Compressed Image
% Usage    : A = svd_reconstruct_201121015(num_val,img)

%% Function starts
function A = svd_reconstruct_201121015(num_val,img)

%% Parameter defaults

if(exist('num_val','var')==0)
    num_val = 0.5;
end

if(exist('img','var')==0)
    img = double(imread('1.png'));
end

%% Copy to output image
out_img = 0.*img;

%% Input image and SVD
for pln = 1:size(img,3)
    A = img(:,:,pln);
```

```

[U S V] = svd(A);

%% Set num_val proportion of eigenvalues to 0 and reconstruct the image
diagS = min(size(S,1),size(S,2));
num_zero = round(diagS*num_val);

Sout = S;

for px = (diagS-num_zero+1):diagS
    Sout(px,px) = 0;
end

% Reconstruction
Aout = U*Sout*V';
out_img(:,:,pln) = Aout;
end

%% Show images
hdl_in = figure; imshow(uint8(img)), title('Input Image');
hdl_out = figure; imshow(uint8(out_img)), title(sprintf('Compressed Image with ratio = %f',num_val));

%% Save results
print(hdl_in,'-v','-dpng', sprintf('./1_input.png'));
print(hdl_out,'-v','-dpng', sprintf('./1_%f.png',num_val));
close all;

```

Results

Input Image



Compressed Image with ratio = 0.700000



Compressed Image with ratio = 0.800000



Compressed Image with ratio = 0.900000



Compressed Image with ratio = 0.950000



Compressed Image with ratio = 0.970000

