

MAD 6406: HOMEWORK 4

Due: Friday, 10/02

Numbered problems are from Trefethen and Bau, Numerical Linear Algebra.

Starred problems (*) require the use of Matlab (or some other language, if you prefer).

(1) Trefethen & Bau, 4.1.

(2)* Download the m-file `img_svd.m`, which was demonstrated in class. Put a jpg image of yourself, a pet, a plant, or your favorite coffee cup, in the same directory. You can use a color image (named, for instance, `me.jpg`), by replacing line 10 of the code:

```
tmpCat = imread('sunnyworking.jpg');
```

with the line:

```
tmpCat = imread('me.jpg');
```

if your image is grayscale, you can remove the next line:

```
tmpCat = rgb2gray(tmpCat);
```

Now run the code. How many terms from the outer product do you need to use in order to recognize yourself? How many for a reasonably good reproduction? What percentage of the total number of outer product terms do you think produces an image where the most important features come across?

(3) 6.1

(4) 6.3

(5) 6.4

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