

```

Im = imread('photo.jpg')

//Im contains object m x n x 3 (3 channels of an image, RGB numbers representation)

//Create an empty 1D array of length m*n*3 to hold numbers from 3D array:
B = zeros(m*n*3, 1)

//Put 3D array's numbers into 1D array B
dim = 3
cols = n
rows = m
index = 1 //index of an array starts with 1 in matlab
for d = 1:dim
    for r = 1:rows
        for c = 1:cols
            B(index) = Im(r, c, d)
            index = index + 1
        end
    end
end

//Print B into a file: one number per line
fileID = fopen('numbers.txt', 'w');
fprintf(fileID, '%d \n', B);
fclose(fileID);

//This saves JPG in RGB numbers into a text file on matlab

//We could just print 3D array int file:
fileID = fopen('num.txt', 'w');
fprintf(fileID, '%d \n', Im);
fclose(fileID);

//This will print all columns (1st column, 2nd column,..., n-th column) of the
first channel, then all columns of the second channel and finally all columns
of the third channel of RGB color representations.

//To convert RGB to grayscale:
Gim= rgb2gray(Im); //reduces dimension to 2D
//to see image:
imshow(Gim);

//2D array is printed also by columns (1st column, 2nd column,..., n-th column)
//If the photo is black and white, matlab reads it as a grayscale image by default.

```

On my iMac Documents/Matlab are the files

This resizes image to 16x16:

<https://resizeimage.net/>

//I used these, this code prints out by rows (1<sup>st</sup> row, 2<sup>nd</sup> row and so on).

```
A=imread('one2.png');
B=transpose(A);
A=B;
fl=fopen('one2.txt', 'w');
fprintf(fl, '%d\n', A);
fclose(fl);
```

My\_DataSets\_Digits.tar contains png and corresponding txt files. Each picture is 16x16 pixels image, each txt file contains grayscale numbers printed by rows.

```
real  4m53.971s
user  4m53.603s
sys   0m0.192s
```

```
[1]+ Done          time ./run train_input256.txt train_output256.txt test_input256.txt
test_output256.txt structure256_4_2.txt weights256_4_2.txt 1000 > tests_new/t02.out
```

Accuracy:

```
eyharris@ecc-linux:~/CSCI581_ANN$ tail -n 1 tests_new/t02.out
0.266666666667
```

```
eyharris@ecc-linux:~/CSCI581_ANN$
real  3m56.484s
user  3m56.286s
sys   0m0.144s
```

```
[1]+ Done          time ./run train_input256.txt train_output256.txt test_input256.txt
test_output256.txt structure256_4.txt weights256_4.txt 2000 > tests_new/t01.out
eyharris@ecc-linux:~/CSCI581_ANN$ tail -n 1 tests_new/t01.out
0.283333333333
eyharris@ecc-linux:~/CSCI581_ANN$
```

```
real  1m34.517s
user  1m34.468s
sys   0m0.024s
```

```
[1]+ Done          time ./run train_input256.txt train_output256.txt test_input256.txt
test_output256.txt structure256_4.txt weights256_4.txt 800 >> out.txt
eyharris@ecc-linux:~/CSCI581_ANN$ tail -n 1 out.txt
0.416666666667
```