

Problem 3 Overview E: Saving photos using "imwrite"

I should have included better instructions on how to "save" each of the successively-compressed Taylor Swift photos at different J-scales ! Ok – here it is:

Consider the compressed (true image) photo at J = 5

(Tiny Meghan Markle = 32×32 at the upper-left corner, but including the 3 high-frequency sectors, it's 64×64):

Suppose your post-compressed photo at J = 5 was stored in a matrix called "J5_raw". The matrix structure would look like this:

$$J5_raw = \begin{bmatrix} \begin{matrix} 32 \times 32 \\ \text{tiny Meghan} \end{matrix} & \begin{matrix} 32 \times 32 \text{ high} \\ \text{freq coeffs} \end{matrix} \\ \begin{matrix} 32 \times 32 \text{ high} \\ \text{freq coeffs} \end{matrix} & \begin{matrix} 32 \times 32 \text{ high} \\ \text{freq coeffs} \end{matrix} \end{bmatrix}$$

a) If you were going to plot it on-screen:

You would have used the "mat2gray" and "imshow" commands:

```
my_black = 127.5;
my_white = -127.5;
J5_grayscale = mat2gray(J5_raw, [my_black, my_white])
imshow(J5_grayscale)
Title('Boom – she is totally tiny !!')
```

b) If you were going to store the 64 x 64 matrix directly into a *.tiff file:

You would have used the "mat2gray" and "imwrite" commands:

```
my_black = 127.5;
my_white = -127.5;
J5_grayscale = mat2gray(J5_raw, [my_black, my_white])
imwrite(J5_grayscale, "tinyMeghan_J5.tif")
```

This image will be an exact 64×64 black & white photo representation of your J5_raw matrix !.....

... which means when I grade your Problem #3, I can open your file up using *imread* and check your matrix values and see if you did it right ! =)

Now, we can extend this to the rest of problem #2:

Consider the compressed (true image) photo at $J = 6$

(Meghan Markle = 64×64 , but including the 3 high-frequency sectors, it's 128×128):



Use *imwrite* to save this guy !

Consider the compressed (true image) photo at $J = 7$

(Meghan Markle = 128×128 , but including the 3 high-freq sectors, it's 256×256):



Use *imwrite* to save this guy !

Consider the compressed (true image) photo at $J = 8$

(Meghan Markle = 256×256 , but including the 3 high-freq sectors, it's 512×512):



Use *imwrite* to save this guy !