BMI/CS 567: Medical Image Analysis © Spring 2020

Homework 1: Basic Image Manipulation

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GO GREEN. AVOID PRINTING, OR PRINT 2-SIDED MULTIPAGE ;)

In this homework you will practice some basic image manipulations such as color model transformations, color channel separation, and scaling.

(a) Load the `brain.png` image into Matlab. You can download it from `https://danielpimentel.github.io/teaching/BMI567.html`. Display its size. Use Matlab's `subplot` function to display the image along with its RGB channels.

(b) Transform the image from RGB color values (default) into NTSC color space. How many components does the NTSC image have (in other words, what is its size)? Use `subplot` to display its components.

(c) Write your own function to transform an RGB image into grayscale (you cannot use any built in or downloaded Matlab function). Apply your function to our brain image. Use `subplot` to display it alongside the result of Matlab's built in function `rgb2gray` and alongside the Y component in NTSC color space. Are they similar at all?

(d) Write your own function to scale an image (you cannot use any built in or downloaded Matlab function). Apply your function to scale our brain image by $1/2$ and by 2. Display your results.