

**LAB 2: DUE 21 OCTOBER 2015**

Implement a simple image processing pipeline. Linear RAW images are provided<sup>1</sup>. Plot all intermediate results. Collaboration is encouraged, but you have to write your own code.

**Task 1: Basic Demosaicing (30 pts)**

Implement demosaicking using linear interpolation. The example image 'lighthouse\_RAW\_colorcoded.png' shows you in false colors which subpixel measures with color channel. Don't use that for demosaicking, use the image 'lighthouse\_RAW\_noisy\_sigma0.01.png'

Check your implementation with other images from data/raw. Lecture 2 slides here [http://franchomelendez.com/Uwr/teaching/COMPHO/\\_LECTURES/L2/digital\\_photography.html](http://franchomelendez.com/Uwr/teaching/COMPHO/_LECTURES/L2/digital_photography.html)

**Task 2: Edge-based Demosaicing (30 pts)**

Implement Edge-based Demosaicing. Compare the results.

**Task 3: Gamma Correction(10)**

The demosaicked image will still be linear, apply a gamma correction to convert it to a proper sRGB image.

**Task 4: (30)**

Unfortunately, the lighthouse is a difficult example for demosaicking. You should see color artifacts in the fence. Go back to the linear demosaicked image, convert it to YCrCb color space and median filter the chrominance channels but NOT the luminance channel. Convert back to RGB and then apply the sRGB gamma.

**Extras**

Capture an image with your camera in RAW mode, extract the RAW image using the command line software dcrw (don't process the image, just extract the linear, RAW), test your code for demosaicing and gamma correction on that image, compare with the results you get from dcrw (for demosaicing and conversion to sRGB).

**Deliverables**

Code and images. You will demo it for marking during the next lab. README file.

- How long did the assignment take?
- Issues and descriptions of your partial solution (for partial credit)
- Any extras?
- Collaboration acknowledgment.
- What was most unclear/difficult?
- What was most exciting?

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<sup>1</sup> Images from <http://stellar.mit.edu/S/course/6/sp15/6.815/> and <http://stanford.edu/class/ee367/courses>