Submission Phase

1. Do assignment ☑ (/compphoto-001/human_grading/view/courses/362/assessments/4/submissions)

Evaluation Phase

2. Evaluate peers ☑ (/compphoto-001/human_grading/view/courses/362/assessments/4/peerGradingSets)

Results Phase

3. See results ☑ (/compphoto-001/human_grading/view/courses/362/assessments/4/results/mine)

Your effective grade is 1

Your unadjusted grade is 1, which is simply the grade you received from your peers.

See below for details.

This week in class, you learned (or reviewed) the mechanism by which rays of light are converted into pixels in a camera. For your assignment this week, we will step away from our computers in order to get some more practical and creative experience with this material. We welcome you to be creative, but do request that you do remain within the confines of the concept defined below.

Your task is summarized with the term '**Epsilon Photography**'. In mathematics, the variable *epsilon* is traditionally used to represent a *small change* (a really minute change!). In this case, we use it to mean that there will be only a small but visible change between each of your photos.

You are to create a set of two (2) to five (5) images of the same scene or a subject (not more than 5 please!). The key is that you are only allowed to vary one parameter (setting) between the images. For instance, you can vary the *aperture*, or the *shutter speed*, but not **both**! Make sure that you are extra careful in keeping all other parameters constant throughout your images. So, if you're varying the aperture, make sure that the scene remains constant. Try to take the shot from the same position keeping the camera as still as possible or use a tripod (if you have one!). This will take some planning, and may also require you to setup a scene to photograph. It maybe hard to do this without a cooperative subject (a pet, or a family member or a traffic scene which you can't control!).

Here are some examples of what constitutes changing only one parameter/setting in small amounts. Choose from the following list (and please come up with more) depending on what camera and the scene you have access to.

- Change only the Aperture Value between multiple image captures. (The images should be going from dark to bright)
- Change only the shutter speed between snaps. (So if the scene is of something moving, you can see motion blur to no motion blur).
- Change the ISO
- Change the Light Source in the scene (take a picture of the same scene with flash turned on and off)
- Change the location of the light source in the scene between snaps (try small location changes of the light source to large and see how shadows change!).
- Change the color of the light source, or the strength (soft light, with soft shadows to hard light with hard shadows).
- Change the light source to have some different structure (use a set of slits in front of the light source to generate "modulated" light source.
- Change the position of the camera ever so slightly between snaps. Try either rotating the camera around its center, or a simple translation (don't do both at the same time!).
- Take multiple snaps of the same object moving slightly (don't change anything with the same camera, just one element/object of the scene. This is sometimes referred to as time-lapse photography.
- Take multiple pictures of the same object, by slightly moving the camera. This movement is related to object, so rotate around the object or just translate it the left or right (think how stereo photography works!).
- Change the focus of the scene.
- Change just the background of the scene, with the same object (in the same location in relation to the camera).
- Be creative, but remember, ONLY change one thing and in very small amount. Some creative examples include, subject changing facial expressions very slightly, or objects of the same size and shape but different reflective and material properties (specular to matte or with different textures).
- We have set up a forum for you to discuss other such setups. Please post your ideas.

You will receive full credit for simply uploading a set of images. However, we encourage you to take a look at the rest of the questions, and to take some time to reflect and write clearly about your process.

Finally, there is an optional section to this assignment where you are asked to take your images and use a software of your choice to manipulate them together. One example of this from lecture was in image differences. Irfan took two pictures, one with an Einstein doll in the shot and one without. We then saw that the difference between the two images gave us only the pixels belonging to the Einstein doll. Other example above also suggest some similar ideas (time-lapse, focus changes, relit scenes, etc.).

After completing this assignment, you will be asked to peer review your classmates. The purpose of this is that you get exposed to some of the ideas and experiments that other people came up with, and that you get some feedback on your own images.

Before going out to collect your images, please read through all of the questions and evaluation criteria below, so you can have a better idea of what sort of things you should be thinking about when you pick up your camera.

Good luck, and have fun with photographs!

Please upload two to five images to a publicly-accessible image host, like picasa, flickr, etc., and provide the link in your response to this question. Make sure that other students will be able to access your album through the link. Do remember to pick an appropriate subject/scene for your photographs and that these will be seen openly on the internet and with the other participants in your class. If you do not like to post your family/friends pictures on the Internet, then we suggest you use props or scenes with no people.

Another option is to upload your photos through this form directly. If you do choose to do this, we ask that you make sure that your files are of manageable size (your image size should be measured in MB, not GB!)

Evaluation/feedback on the above work

Note: this section can only be filled out during the evaluation phase.

Did the student make their images accessible?

Score from your peers: **1**

In 200 words or fewer, concisely describe the one parameter that you varied between your images, and efforts taken (if any) to keep all other parameters constant.

Evaluation/feedback on the above work

Note: this section can only be filled out during the evaluation phase.

Did the student successfully isolate one parameter to vary between their images? Provide constructive feedback identifying parameters the student may have missed (if any).

peer 2 → N/A

peer 4 → I assume that the camera was tripod mounted or just lying on the floor or table and was manually focused. Varied shutter speed while maintaining all other exposure parameters constant (stated) over a sufficient range to be slow enough that the individual blades of the fan are not? discernible and through to fast enough to almost freeze the motion. So, successful objective.

peer 5 → Ok.

In 200 words or fewer, concisely describe all the ways in which your chosen parameter affected your photos.

Epsilon Photography

Object

A Moving object: a rotating ceiling fan

Fixed parameters

- Camera position (with Canon EOS Rebel T3)
- Focal length
- ISO
- Aperture (f/5.6)
- Light source (daylight)
- Scene setting

Parameter Varied:

Shutter Speed (from 1/25 to 1/500)

As observed, the motional blurring decreases as the shutter speed is increased from 1/25 to 1/100, as we can see the blades can be seen more clearly.

As can be seen, since the increase in shutter speed allows lesser and lesser amounts of light from the moving object to sensor, the images get darker and darker, with all the other parameters fixed.

Hence, consolidating, epsilon increase in shutter speed results in

1. **Decrease** in **motional blurring**.
2. **Reduction** in **overall brightness** of the image.

Evaluation/feedback on the above work

Note: this section can only be filled out during the evaluation phase.

Was the students analysis complete? Did they miss any ways in which their photos differed?

peer 2 → yes

peer 3 → Good analysis. I think you covered the main effects of adjusting the shutter speed.

peer 4 → The conclusions given in points 1 and 2 to the exercise of increasing shutter speed are precise and concise - perfectly adequate.

peer 5 → Ok.

(Optional) Use a software of your choice to combine your epsilon shots into a single composition (Photoshop, Python, Matlab, etc...), and make it accessible to other students, as in the instructions to the first question above.

In your response to this question, explain the computations that you used to obtain your final image. Take some time to discuss how the varying parameter and your chosen method of combining the images work together to create an interesting result.

Epsilon Photography.pdf (https://coursera-uploads.s3.amazonaws.com/user-2d5edb9d2510431d02fbb340/362/asst-4/362-516a80bb267ce6.47689322.pdf)

Evaluation/feedback on the above work

Note: this section can only be filled out during the evaluation phase.

(Optional) Take some time to think and respond to the final image. Do you think it is an interesting result? Can you think of ways in which this method can be extended? Feel free to discuss any impressions you may have.

peer 4 → No final image submitted and no further commentary made

peer 5 → No combination of the photos submitted.