Great (Focal) Lengths

Project 2. Due 5:30PM on Monday, October 17, 2011.

I. Planning, setup, and photographs (70 points)

Perhaps some of the most rewarding photographs you will take are those that require planning, setup, and a bit of luck. Getting everything just right for that single shot to be absolutely perfect is not an uncommon occurrence. Many times, the problems that can arise when taking these sorts of photos can be overcome by some special combination of money, manpower, and time, but it is not often the case that a photo you are taking will be professionally sponsored and, therefore, money and manpower are often limited. Every so often, these limited resources can stir the additional creativity that's necessary to make a fantastic result.

That's precisely the idea behind this project. During the two weeks that this project is released, you will plan, setup, and execute a specific type of photograph, and continue working on it until the photographs are perfect while documenting your steps towards their completion. You may also optionally work with one other person from the course, as some photographs might be particularly challenging for only a single person. In fact, we encourage group participation, as an upcoming project will rely on it more heavily.

Here are some examples that give you an idea of the sorts of photographs that require this planning and setup. You may choose **one** of these ideas and execute it, or you might come up with **one** of your own. Feel free to email the staff at `staff@cse7.org` with your idea if are not sure if your own idea will be of sufficient scope for this project. You need not purchase anything to complete this project as many ideas can be executed by being creative with the materials you might already have around the house.

- **Design an in-house studio (4-5 photos)**. You might create your own studio, of sorts, in your house, apartment, or office, to capture either still-life objects or arrangements, or even as a portrait studio for yourself or others. Look around for example photos taken in a studio and study the different types of lighting techniques that are used, and try to replicate them with lamps or, if you have them, external flash units. Setting up the lighting is crucial, as is ensuring the background is evenly lit. Here's an opportunity to take photos with an entirely underexposed or entirely overexposed background for effect. You might try taking 3 or 4 photos with this studio setup with different lighting and background techniques to get a feel for this.

- **High-speed flash photography (3-4 photos).** If you don't already own one, obtain (perhaps by renting) an external flash unit with full manual control over its power. Generally, high-speed flash photography is best achieved with the use of a circuit that will trigger the flash unit when some event occurs, such as a loud sound. You might use this as an opportunity to take a photograph of a balloon popping, a water droplet hitting a surface, or some other high-speed event. Be sure to experiment with interesting compositions, angles, and colors. For example, you might try to add food coloring to some water if your photograph calls for it, or you might try to add color gels to the front of the flash unit to add some color to the photo.

  The following links might be useful to get started:
  Images by Dr. Harold Edgerton: http://edgerton-digital-collections.org/galleries/iconic
  Circuit design from NCSSM: http://courses.ncssm.edu/hsi/pacsci/fpaper.html

- **Medium-altitude photography (4-5 photos).** High-altitude photography is becoming more popular as the materials needed to send cameras to the upper layers of the atmosphere become less expensive and more accessible. This sort of photography poses particularly interesting challenges as you must make sure your balloon is legally able to fly (check the Federal Aviation Administration's website), your equipment must survive the extreme changes of atmospheric pressure and temperature, and you must have a way of recovering your equipment once it lands. For this reason, high-altitude photography is probably difficult to achieve in the limited time provided for this project, but safely strapping your camera to a device that can provide at least some increase in altitude is, perhaps, a more achievable goal. The aircraft keeping your equipment airborne need not be a balloon, either, as it could be a model airplane or, if you're exceptionally brave, a model rocket. Be sure to take **all** the necessary precautions if you and your partner decide to pursue this idea.

  For some inspiration, you might take a look at: http://vimeo.com/24390348

- **Super-long exposure (2-3 photos)**. Capturing star trails or aurorae requires patience, good geographical position, and a bit of luck with the weather, but are also among the most rewarding photographs to take. A typical star trail exposure can last hours so planning ahead is a must. Since a cold battery will die more quickly, make sure that your camera stays relatively warm if you find that the October nights are becoming a bit chilly. Also make sure to provide some context for your photograph by capturing some fixed object on the ground in your photograph. In other words, a photo of just a trail of stars with no fixed reference point may not be quite as successful. If you are taking a star trail photo in the northern hemisphere it is worthwhile to pay attention to the location of Polaris, as this star is a good approximation of the direction of the pole and will provide you with some circular star trails. Like this:
  http://philhart.com/gallery/Astrophotography/Phenomena/Biolumiscence_Star_Trail_sm.jpg.html

  As with many of the rules in photography, though, sometimes breaking these conventions can result in some equally great results. Like the following:
  http://blogs.discovermagazine.com/badastronomy/2010/06/24/the-lines-in-the-sky-are-stars/

- **Fun with Ferrofluids (4-5 photos)**. Ferrofluids are liquids that contain magnetic particles suspended within at a specific ratio. Placing a ferrofluid near a magnet will result in fascinating patterns as the fluid reacts to the magnetic field. They make for captivating photos, and combined with some creative compositions would make some very abstract art.

  More information on ferrofluids: http://en.wikipedia.org/wiki/Ferrofluid
  DIY: http://chemistry.about.com/od/demonstrationsexperiments/ss/liquidmagnet.htm

Again, these are just a few of the possible ideas that would satisfy the requirements for this project! Feel free to implement an idea that is not listed above if you would like, but you might want to email the staff to ensure it is of sufficient scope.

The number of photos you submit depends on the type of project you do. We have defined an approximate but reasonable number of photos for each of the above ideas. Notice that some types of projects (eg, Studio, Ferrofluid, or Altitude) are more likely than the others to produce numerous photos that are interesting and unique for the amount of work that is put in. If you decide to implement your own idea, use these numbers as a guideline or ask the staff for some guidance.

You may optionally work with one other person on this project, if you'd like. If you don't happen to know many other people in the class but are interested in working with someone else you may fill out the following form and we will randomly assign you a partner:

http://cse7.org/group

If you wish to be assigned a partner you must fill out that form **before Friday, October 7**, or you'll risk starting the project too late. We will close submissions to the form at 11:59PM that day.

You may divide the work however you'd like among group members, but each person must perform approximately equal quantities of work towards the completion of the project.

The technical requirements for these photos are as follows:

- You must submit **no fewer than 2** and **no more than 5** images. The final number depends on the type of project you select.
- You may name the image files however you'd like.
- Given how few images we require, the end result is expected to be as near to perfection as possible.
- Each submitted photo must be **unique**. In other words, if your project calls for 2 photos, don't simply submit two versions of the same photo, with only slight differences in composition, exposure, or quality.
- Photos you take should be taken with an **advanced metering mode** such as aperture priority, shutter priority, manual mode, bulb mode, or program mode. If you believe your project would require some alternate form of exposure mode (for example, it might be unreasonably difficult to use anything but a fully automatic mode for a project based on medium-altitude photography) then be sure to get this approved with the staff.
- You may optionally work with one other person on this project. Both group members must be registered for the course. You may divide up the work however you please, but each person must strive to perform equal quantities of work towards the completion of the project.
- The **EXIF data** associated with your photographs must remain wholly intact. If you are unsure if your modifications will result in the erasure of this metadata, please submit the photos directly from the camera. We'll discuss EXIF data in upcoming lectures, but here is some preliminary information: http://en.wikipedia.org/wiki/Exif
- The photos **must not be resized**. We should be able to view the photos at their full resolution. Aspect ratio crops for composition are acceptable. Again, if you are in doubt, use the photos directly from the camera.

- Small modifications to the image such as color tweaks, contrast enhancement, *etc.*, are acceptable. However, please be sure that your image still meets all of the other requirements; notably, the EXIF data must be preserved and the image must be submitted at its original size.

- All submissions should be **original photos** taken by you or your group for the purposes of this problem set.

- Be sure to submit the photos in the **JPEG** file format; this should be the default for many, if not all, cameras. If you prefer taking photos in RAW format, note your camera may have a "RAW+JPEG" setting where it will save a photo in both formats. You may also submit a photo that was taken in RAW and processed to JPEG, but you must ensure the preservation of the EXIF data. No need to be concerned if you are unfamiliar with RAW, we will be talking about it later in the course. If you're curious, there is some information about it here:
http://en.wikipedia.org/wiki/Raw_image_format

- To submit these photos by the due date, simply place them in the "**2-Great Focal Lengths**" folder in the Dropbox directory we shared with you. Please be sure to place them in the directory with enough time for them to upload to the servers before the project is due. You may submit early and modify the images as many times as you wish before the due date. However, take special care not to modify any of the files in this directory after the due date or your entire submission will be considered late.

- If you are working in a group, only **ONE** of you may submit to Dropbox. The other person must not submit a copy of any portions of this assignment; instead, that person should include a file called **Group.txt** that lists the name of the person whose Dropbox contains the submitted project. All three required parts of this project (final photos, the documentation, and the Tumblr permalink) must be submitted by the same person, and the only file submitted by the other person is the Group.txt file.

II. Documentation (25 points)

As part of this project be sure to document how you (or your group) have achieved the end result. The goal of this documentation is not progress reports or status updates, but rather a "behind-the-scenes" look at the work you've put in for the resulting images. You should include photographs of your setup (these documentation photographs do not count towards or against your final image limitations) and a Word document (or similar, text documents and PDF also acceptable) that allows you to explain and show off the work you put in to this project.

The requirements for the documentation are:

- In addition to the final photos, you must also submit a 1-3 page Word (.doc, .docx), Text (.txt, .rtf), or PDF document that describes, behind-the-scenes, how the final images were captured.

- The document should be named, *e.g.*, **BehindTheScenes.doc**

- The document must include the names of all group members at the top of the first page.

- You must also include 3 or more images that are much less formal than the final photos and are used simply to document how your project was executed. In other words, we're not looking for technical perfection in these documentation photos; indeed, using a fully automatic cameraphone would be acceptable, so long as the photos clearly show your setup. These documentation images are counted separately from the final images that you take as part of this project.

- You may either embed the images within your document or include them separately. If they are separate, the photos must be named **BTS1.jpg**, **BTS2.jpg**, etc.
- Submit the documentation by placing it into the "**2-Great Focal Lengths**" folder in the Dropbox directory we shared with you. If working in a group, this documentation must be submitted to the same Dropbox folder as the final images. In other words, all three required parts of this project must be submitted by the same person.

III. Tumblr (5 points)

Finally, post something to the course blog! You may choose to post one of your final images, if you'd like, or perhaps a link to some related material that you found while researching for this project. The post need not be directly related to the material in this project, though, and you might post something that is instead tangentially related to digital photography. Given the opportunity, though, this might be a great time to show off your hard work!

Only one post is required per group. If you are working with a partner, only one of you needs to create a new post.

Of course, this is only a minimum requirement - you should feel free to contribute to the fascinating photos and links that are being accumulated on the blog even outside the scope of a project.

Once you have created your post, paste the post's permalink into text file (a Word document, PDF, or plain text file is fine) and save it as "Tumblr" in the "**2-Great Focal Lengths**" folder in the Dropbox directory we shared with you. Be sure this is done before the due date, or your entire submission will be considered late. If working in a group, this file must be submitted in the same Dropbox folder as the final photos and the documentation. In other words, all three required parts of this project must be submitted by the same person.