PROBLEM ASSIGNMENT 1

Due: March 10, 2015 (12:30pm)

The purpose of this first assignment is to make you understand the image formation process and to familiarize you with Matlab environment you will use in the following exercises. There are a total of two problems.

Problem 1: Bad Photos

Take some photos with a digital camera of yours that one might consider technically bad but even so interesting and aesthetic in some way. You are required to submit at least 3 photos (max. 8), meeting one of the specifications given below. In your report, please explain the conditions about how you took the picture, what camera setting you used, etc., and most importantly indicate which requirements each of your photo meets.

- **Specification 1:** At least one photo should be poorly exposed. That is, most of the image should be either very close to black (underexposed) or close to flat white to due oversaturation (overexposed).
- **Specification 2:** The main subject of at least one photograph must be motion-blurred, either due to movement of the subject or movement of the camera.
- **Specification 3:** In at least one photo, nothing at all should be in focus. It’s hard to take a good looking photo where nothing is in focus, so be creative!

![Figure 1: An out-of-focus picture. Tropical fishes at the Osaka Aquarium Kaiyukan. Photo by Aykut Erdem.](image)

Problem 2: Ken Burns Effect

“The Ken Burns effect” [1], dubbed after the famous documentary filmmaker who popularized this cinematic technique, is a type of panning and zooming effect used in producing videos from photographs to give the still images a sense of motion. The effect is typically performed as slowly zooming in on subjects of interest in an image and panning from one subject to another.

1Adapted from the assignment developed by Marc Levoy, Andrew Adams, and Jesse Levinson at Stanford University.
In this part of your homework, implement a simplistic Ken Burns effect in Matlab to generate videos from at least 3 different images. You can ask the user assistance to select the subject of interests, the simulated camera motion direction, etc. To give you an idea, you can refer to the study in [2] for a more complex version, which includes automatically detecting region of interests, e.g. by face detection, and utilize depth information to give a more 3D effect.

Grading

The assignment will be graded out of 100 points:

- 0 (no submission), 20 (an attempt at a solution), 40 (a partially correct solution), 60 (a mostly correct solution), 80 (a correct solution), 100 (a particularly creative or insightful solution)

Note: Preparing good report is important as well as your solutions!

What to Hand In

You are required to submit all your report along with a short webpage in HTML. For that purpose, prepare a folder containing

- HTML/README.txt (text file containing details about your project)
- HTML/code/ (directory containing all your code)
- HTML/ (directory containing all your documents, including your images)
- HTML/data/ (including your data images)
- HTML/result/ (including your result images)
- HTML/index.html (html report)

Archive this folder as pset1.zip and email to my email address (aykut@cs.hacettepe.edu.tr).

Each student must individually do the coding and prepare detailed HTML report which contains a brief overview of the problems, details of your implementation and results with your observations. If your implementation failed to give a satisfactory results, provide a brief explanation of the reason(s).

Late Policy

You may use up to five extension days (in total) over the course of the semester for the three PSets. Any additional unapproved late submission will be weighted by 0.5.
Academic Integrity

All work on assignments must be done individually unless stated otherwise. You are encouraged to discuss with your classmates about the given assignments, but these discussions should be carried out in an abstract way. That is, discussions related to a particular solution to a specific problem (either in actual code or in the pseudocode) will not be tolerated. In short, turning in someone else’s work, in whole or in part, as your own will be considered as a violation of academic integrity. Please note that the former condition also holds for the material found on the web as everything on the web has been written by someone else.

References
