

CISC440/640 – Spring 2015
Programming Assignment #1
Due 03/06/2015 (before 11:59:59pm)

Objective: In this project you will build a tool for generating animations from still images in the style of the acclaimed documentaries of Ken Burns. Your tool must support panning within an image and transitions between images. Your application must support the loading and displaying of multiple images. You will write a variety of geometric-image-processing functions. You can use code from the lecture 3 and 4 as a starting point.

Requirements:

Part I for both undergraduate and graduate students.

- 1) Your program must be able to read in, and simultaneously display 1 source image and 3 target images.
- 2) Your program must be able to display the target images in viewing windows (similar to Ken Burns style).
An easy way to handle 1) and 2) is to draw multiple rectangles in the world and texture them accordingly. For each target image, you can dynamically generate an image and then a texture map.
- 3) Specify rectangles indicating a starting viewport and an ending viewport on the source image, these should be drawn as an outline over the source image.
- 4) Select any corner of viewport rectangle and reposition it.
- 5) Display the subimage inside each quadrilateral in its corresponding viewing window.

In order to implement 5), you need to figure out the mapping from screen coordinate (when you click your mouse) to the pixel coordinate of the image. This is more complicated than screen-to-world mapping that we have discussed in class. To do so, you can first map screen coord to world coord, then world coord to texture coord in the image. Some mouse function is demonstrated in Chapter 11-6 of the textbook.

Part II:

Undergraduate and graduate students:

- 1) Specify the number of frames to be generated along a specified path (from the start view window to the ending view window) on the image. Also allow for the specification of a separate number of frames for a transition from the end window back to the start window. (You are NOT required to use an interface for this part. You can simply hard code it in your program).
- 2) Synthesize and display an animation consisting of a series of frames along the specified viewing path. This should be accomplished by uniformly linearly interpolating the corners of the view window.
- 3) Synthesize a fade transition from the end frame back to the start frame.

Graduate students ONLY:

- 4) Your program must specify arbitrary quadrilaterals indicating a starting window and an ending window. These should be drawn as an outline over the images.
- 5) Your program must be able to demonstrate the projective transformation transforms (for mapping any viewport to another).
- 6) This homework can be VERY time consuming if you have not programmed large systems before. So start early!

Policies: Everyone must turn in their own assignment. You can collaborate with others, but any work that you turn in should be your own. The procedure for turning in your work will be posted on the web.