CS 63500

Spring 2018

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Due: Sunday February 25 at 11:59pm

**Assignment 3—Stitching and Rendering from Panoramas**

***In a nutshell***

Implement a basic application that registers a set of overlapping same viewpoint photographs, builds a panorama from the registered photographs, and renders the scene interactively, from the panorama viewpoint, in any direction, and with any field of view.

***Details***

1. Take a set of at least three overlapping same viewpoint photographs of a real world scene
2. Register pairs of consecutive photographs together
   1. Minimize color difference at the region of overlap (no manual features)
   2. Use the optimization approach of your choice (OK to use the one from A2)
   3. OK to use known camera intrinsics (i.e. field of view)
3. Build a cubemap from the registered photographs
   1. OK if all photographs fit in one face of the cubemap, i.e. their cumulative net FOV is less than ninety degrees.
4. Allow the user to render the scene interactively from the center of the cubemap
   1. Support interactive pan, tilt, roll, and focal length changes.
5. Make a 10s video that shows the scene rendered with pan, tilt, roll, zoom in, and zoom out.
   1. The video should have a subtitle stating the registration error you have achieved, and the number of error function evaluations performed during registration.
6. Extra credit
   1. Panorama with very close object and precise translation-free acquisition (1%)
   2. 360 degree horizontal panorama (1%)
   3. Complete panorama (2%)
   4. Stitching with variable weights to alleviate dynamic range issues (1%).
   5. Anything else that creates a compelling visual experience (negotiable%)

***Turn in via blackboard***

An archive that contains:

* Your source code and binaries
* Your output video
* A short report that lists the optimization method used, the error achieved, the number of error evaluations

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