CS 63500 Spring 2018 Voicu Popescu 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
 - a. Minimize color difference at the region of overlap (no manual features)
 - b. Use the optimization approach of your choice (OK to use the one from A2)
 - c. OK to use known camera intrinsics (i.e. field of view)
- 3. Build a cubemap from the registered photographs
 - a. 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
 - a. 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.
 - a. 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
 - a. Panorama with very close object and precise translation-free acquisition (1%)
 - b. 360 degree horizontal panorama (1%)
 - c. Complete panorama (2%)
 - d. Stitching with variable weights to alleviate dynamic range issues (1%).
 - e. 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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