Workshop: Virtual tours

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March 2015

Virtual tour: A series of spherical panorama images along with software to provide navigation within a panorama and to provide transition between multiple panoramas.

There are many ways of capturing a spherical panorama, most consist of a number of individual images with some degree of overlap. The images are stitched together to form a partial or whole spherical panorama (360 degrees longitude and 180 degrees latitude). Such an image captures everything visible from a particular position and hence provides the navigation at each position. The field of view of the photographs dictates the number of photographs required for coverage and the final spherical panorama resolution.

High resolution spherical panorama images generally use a robotic rig to potentially take hundreds of photographs, generally referred to as gigapixel images. Such images can be time consuming and often driven by other motivations than virtual tours. The approach here, and choice of hardware/software, is to be able to capture a large number of spherical panoramas of average resolution reasonably quickly in order to form a virtual tour with a reasonably high number of nodes.

Workshop tools

- Canon 5D Mk III camera
- Canon 8-15mm zoomable fisheye lens
- Steady tripod with level and angular gradation marks
- Nodal Ninja mount
- AutoPano Pro (stitching images)
- Photoshop
- PanoTour Pro (forming tour)
- Web server

Photography

Option 1: Camera in landscape mode, fisheye lens zoomed to fill sensor vertically, take 3 or 4 photographs. Results in 8K spherical panoramas.

Option 2: Camera in portrait mode, fisheye lens zoomed to fill sensor horizontally (now vertical), take 4 photographs. Results in 12K panoramas but overlap may not be enough for some scenes with large areas of plain surfaces.

Pipeline

- Choose node position.
- Level tripod, important for a good sky stitch and level horizon.
- Choose camera settings as normal. Consideration to the fact that the fisheye captures a large field of view.
- Take photographs. Pay attention to movement in the scene especially obects moving between camera view directions.
- Stitch in AutoPano Pro and export as 16 bit.
- Open in Photoshop and edit as desired.
- Export in favourite format. For next step using my tools this should be TGA.
- Create cube maps, using my tools this is "sphere2cube".
- Edit tripod (south pole) and possibly sky (north pole). Useful tools being the context aware fill and clone tool.
- Reform spherical panorama. Using my tools this is using "cube2sphere".
- Possibly further edit in Photoshop, for example, change size.
- Create tour using PanoTour Pro and one or more spherical panoramas.
- Copy to web server for online viewing.

Reference material by author

Pipeline: http://paulbourke.net/miscellaneous/sphericalpano/

Spherical video: http://paulbourke.net/dome/ladybug/

LadyBug-3: http://paulbourke.net/papers/LadyBug.pdf

Panoramas from a flying drone: http://paulbourke.net/exhibition/dronefun/