Space-time Analysis of Spherical Projection Image

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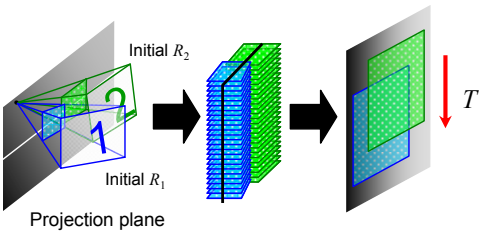
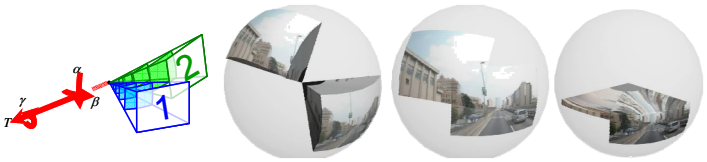
We propose a novel analysis of space-time volume of spherical projection image. So far, space-time analyses have been extensively conducted for various purposes, i.e. 3-D reconstruction, estimation of camera motion and novel view synthesis and most of them consider only a planer projection and a single camera. In contrast, we conducted analysis on spherical projection for multiple cameras. Since spherical projection does not change its appearance in relation to rotation around the origin of the sphere, extrinsic camera parameters and synchronous parameters of multiple video cameras can be simultaneously estimated by registering multiple space-time volumes of spherical projection, which can be easily achieved by block-matching technique. By using the parameters, multiple video images can be successfully integrated into single omni-directional images without distortions.

Publication

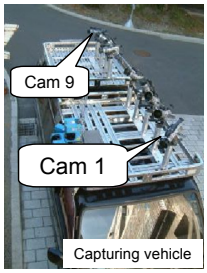
[1] S. Ono, T. Mikami, H. Kawasaki, K. Ikeuchi, "Space-time Analysis of Spherical Projection Image," The 18th International Conference on Pattern Recognition (ICPR), Hong Kong, China, Aug. 2006.

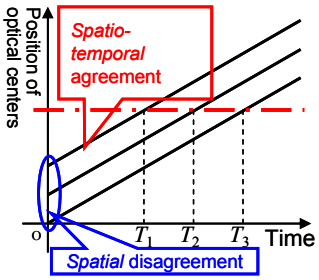


Ordinary S-T volume

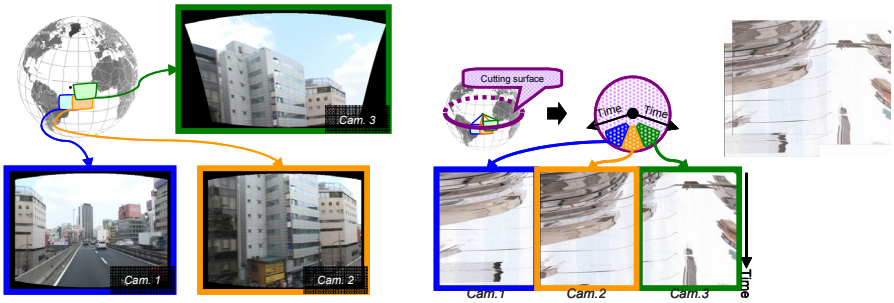


S-T sphere





Capturing system



S-T Sphere in Actual Scene

Mosaiced panorama video appears on a sphere surface

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