

Constructing Panorama with Light Probe and HDR Fusion

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Motivation

- Inspired by a technique to build panoramic view mentioned in the lecture.
- Learn more about techniques and experiences in burst photography.
- Implementation of applications that transform given photo with some arbitrary rule (spherical transformation).

Related Work

There are several common ways to capture panorama photograph:

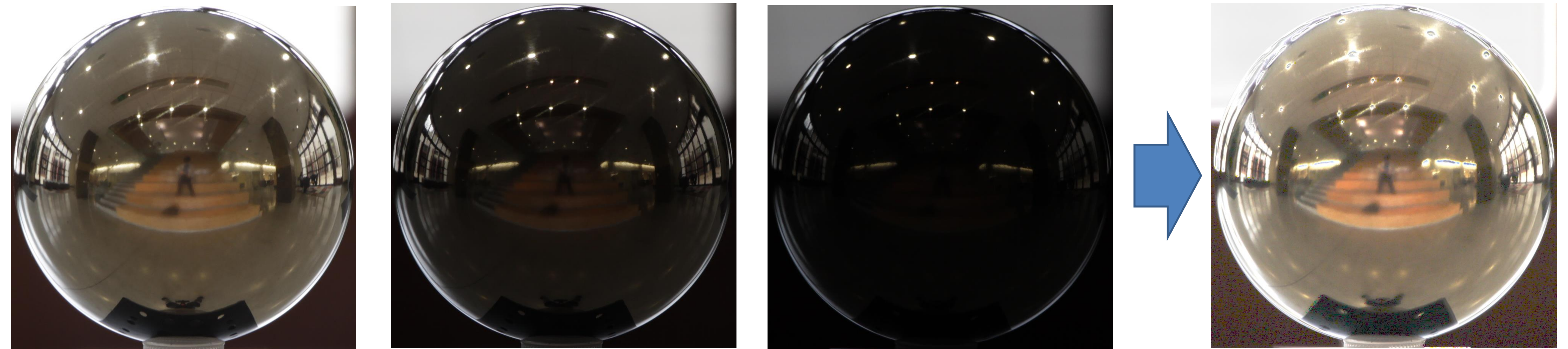
- Rotating line camera: flexible and robust, but is a bit hard to take and does not cover 360 degree.
- 360 degree panorama camera: good performance but costly. Multiple sensors and lenses involved.

References

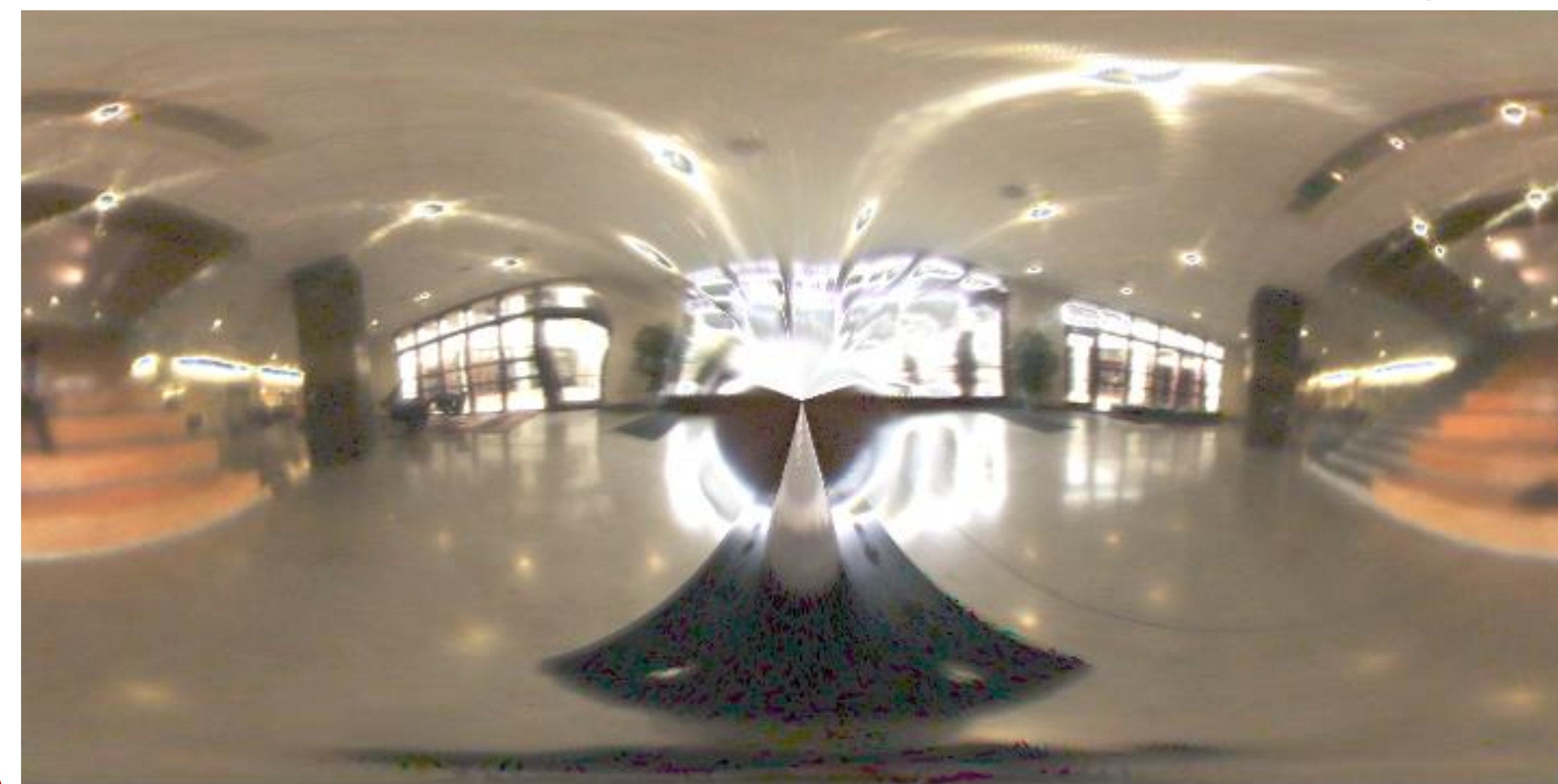
- [1] DEBEVEC, P. E., AND MALIK, J. Recovering high dynamic range radiance maps from photographs. In SIGGRAPH '97 (August 1997), pp. 369–378.
- [2] DEBEVEC, P. E., Rendering Synthetic Objects into Real Scenes: Bridging Traditional and Image-based Graphics with Global Illumination and High Dynamic Range Photography, In SIGGRAPH '98

Techniques

- Capture the detail appearance of a spherical light probe under the scene with fixed f-number and different exposure time. Cut the resulting image with only the sphere part remained.
- Recover HDR radiance map through LDR merging with the captured images.
- Implement and apply transformation from the image space into the expected space. In this project, we are going to get equirectangular panorama as the result.



Results & Analysis



The result is as expected. The panorama is a bit blurry due to the slight shift between taking the photos.

Future work: Qualitative Analysis of such panorama; uv-mapping to make it texture for inner-spherical object.