Capturing light fields using many light probes
EE 367 Winter 2016 Project Proposal
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I. PROPOSAL

This project idea is motivated from the image based lighting technique presented in the class, where a single spherical mirror is used as a light probe for image based lighting. The project involves using an array of spherical mirrors arranged in a fixed pattern to capture the light field of the surrounding and possibly reconstructing some details of the 3D scene from the reflected images. There is a rich amount of literature on image based lighting techniques [1] [2], which involves using a single spherical mirror as a light probe. There have also been studies on reconstructing specular surfaces [3] [4] and 3D scenes from the reflection images in a mirror [6]

The main steps in the project would involve construction of a spherical mirror array of a fixed pattern, taking pictures using a high resolution camera and recreating the light field processing the data obtained. A rough time-line of the project would be as follows

1) Construction of spherical mirror array - 1 week
2) Taking photographs in multiple locations - 3 days
3) Processing data and recovering light field - 1 week
4) An attempt at 3D scene reconstruction - In the remaining available time

REFERENCES