

Relighting Real-World Scenes  
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**Abstract**

We present two methods – radiance maps and reflectance maps – for lighting 3D models of buildings using high dynamic range (HDR) light probes. These methods, introduced recently by computer graphics and computer vision researchers, are perhaps the two most promising approaches in order to understand the interaction between the lighting and the surface properties. We capture a 360 degree view of a real-world scene by acquiring many omnidirectional images at different exposures and stitching them together into an HDR light probe that will be used to light the 3D models. A radiance map of a scene in the real world is created by capturing a static view of a building by acquiring many images at different exposures and stitching them together as well. Reflectance maps are created by capturing the same scene at different times and breaking down the images into a reflectance map and an illumination map. The 3D scene with these radiance and reflectance maps are relighted using several different light probes that we have created. These images are also compared with a simple approach of using hand-crafted textures and image masks, where masks for reflective values have been applied to different parts of surfaces such as windows and wooden doors. We expect that the comparison shown in this work will provide a better understanding of the relationship between these two approaches.