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Period 4

To determine the 3D shape of an object, we can use the grayscale intensities, or shading intensities, from a photo taken of the object. There will be difference in intensity because the light source when taking the image will cause the surface closest to it to be brighter. Photometric stereo, a technique where a person projects patterns onto the object and measures its resultant position on the image, can also be used to determine depth information. Specific types of patterns are also less valuable than others; for instance, projecting a grid of lines doesn’t contain that much information because as they’re all parallel lines to each other and tell the computer the same exact thing. While I understood why they assumed there would be at least one light source, there seemed to be the implication that there would only be one major light source in the original image. It would be interesting to see the determination of depth information would change based on the number of major light sources. The principle behind the technique is that you’re modeling the reflectance of objects in an image as a function of angles of incidence and emergence of light from the surface, so I also was wondering if the type of surface would cause the calculations to be variable or not (i.e., Lambertian vs non-Lambertian). While I found most of the math to be boring to follow, I also found Hourad’s Junction Orientation Technique to be pretty cool.