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Preliminary Speech Outline Bump Mapping

-Intro to Bump Mapping
-Different Bump Mapping Techniques
-Normal Mapping
-Displacement Mapping
-Relief Mapping
-In-Depth Information on the Applications of Bump Mapping

Intro to Bump Mapping

Bump mapping is a technique used in 3D computer modeling to give objects the illusion of depth by altering their appearance [1], [2]. A number of different techniques exist for creating bump maps, including normal mapping, displacement mapping, and relief mapping. These techniques will be described later in greater detail. Bump mapping typically works by modifying the normal angle of a surface, thus affecting how it is shaded. What this means is that the light which is hitting the surface is made to reflect in a way in which it appears as though the object has a more uneven or complex shape than it actually has [2]. This proves to often be much less intensive for computers to render than a highly detailed model.

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Normal Mapping

Normal Mapping is an implementation of bump mapping. It is commonly stored as regular RGB images where the RGB components correspond to the X, Y, and Z coordinates, respectively, of the surface normal. The RGB information tells us the exact direction of the surface normal and how it should be oriented for each and every polygon, and tells an application how the polygon should be shaded. [1].

Bump Mapping Techniques in depth

Typically, bump maps are grayscale images that are limited to 8-bits of color information. In which is calculated to be only 256 variations of black, gray or white. These information can be important is that when values in a bump map are close to 50% gray, there's little to no details that comes through on the surface. When values get brighter and working its way toward the white spectrum, details appear to pull out of surface. Applying the same logic when values get darker and closer to black, they appear to be pushing into the surface. Due to these techniques, it is important to note bump mapping works best for creating tiny details on a model, for example: pores or wrinkles on skin, and silhouette of the geometry that the bump map is applied to will always be unaffected by the map.