Texture and Surface Appearance

October 11, 2004

Two-plane light field

Levoy and Hanrahan 1996
Gortler et al. 1996
Surface Light Field -- Summary

• May be considered a compression scheme for light field data.
• 3D geometry required!
• Questions:
  (1) Do we need detailed 3D geometry?
  (2) Isn’t this texture mapping?
In Retrospect

• No lighting change in light fields or surface light fields?
• How is it different from texture mapping?
• Somehow related:
  – Microfacet-based BRDF (See [Ashikhmin et al, SIGGRAPH 2000])
  – Meso-structure (e.g., brick surface).

Game Plan

• First, a quick introduction of texture mapping.
• Then, a quick look at BRDF (10/14 or later).
• Then, BTF.
Texture Mapping

- The simplest form: like wrapping a picture on an object.
- Texture: 2D image or a simple pattern (like a checkerboard)
- Surface: could be any shape

Procedural Texture

- A simple example: checkerboard.
- Solid texture. Example: wood carving.
Bump Map and Displacement Map

• Examples:
  – Golf ball

• Bump Map vs. Displacement Map:
  – Bump Map: only the looks change

Figure 8.10 of "3D Computer Graphics, 3rd Ed." by Alan Watt
Environment Map

Figure 18.9 of “3D Computer Graphics, 3rd Ed.” by Alan Watt

More Examples

geometric model  texture mapped

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More Examples

Environment Map

Bump Map