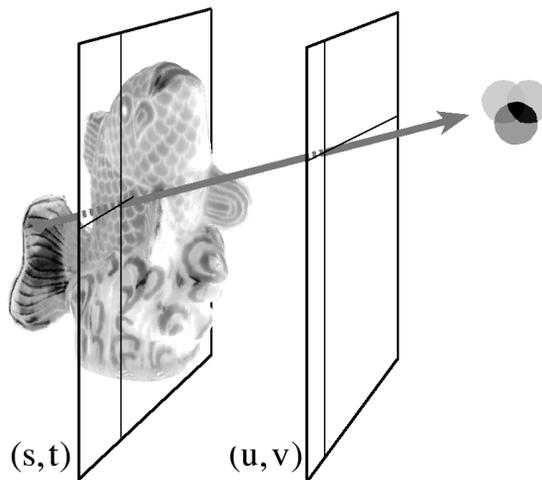


Texture and Surface Appearance

October 11, 2004

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Two-plane light field

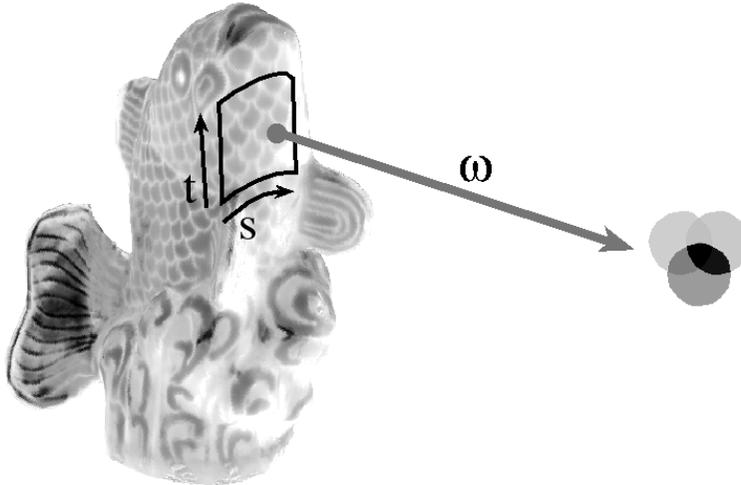


Levoy and Hanrahan 1996

Gortler *et al.* 1996

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Surface light fields



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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?

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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).

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Game Plan

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

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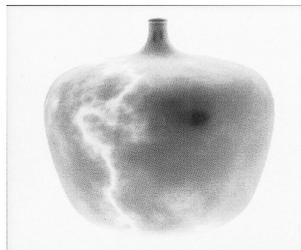
Texture Mapping

- 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

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Procedural Texture

- A simple example: checkerboard.
- Solid texture. Example: wood carving.
- More advanced: Perlin noise.



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Bump Map and Displacement Map

- Examples:
 - Golf ball
- Bump Map vs. Displacement Map:
 - Bump Map: only the looks change
 - Displ. Map: the actual surface points change.

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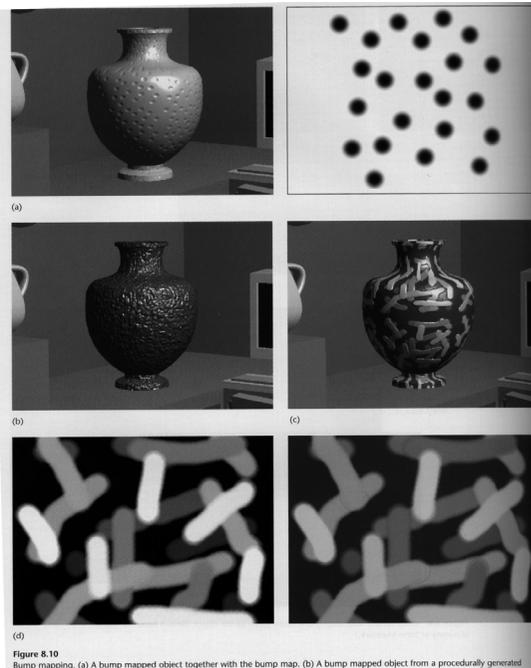


Figure 8.10 of "3D Computer Graphics, 3rd Ed." by Alan Watt

Environment Map

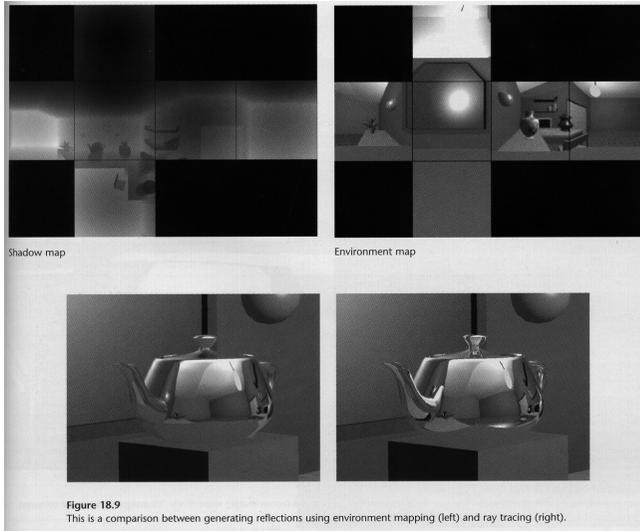
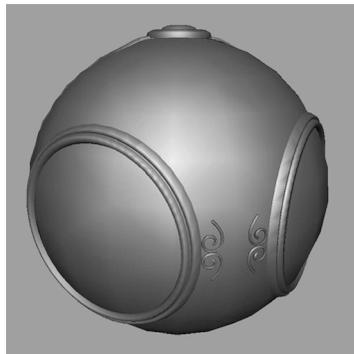


Figure 18.9 of
"3D Computer
Graphics, 3rd Ed."
by Alan Watt

More Examples



geometric model



texture mapped

More Examples



Environment Map



Bump Map

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