

Today		
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• Texture Mapping		
• 2D		
• 3D	-	
• Procedural		
 Bump and Displacement Maps 		
• Environment Maps		
Shadow Maps		
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Surface Detail

• Representing all detail in an image with polygons would be cumbersome







2D Texture Mapping of Images

• Example of texture distortion



5



MIP Map

• Pre-compute filtered versions of the texture

- A given UV rate is some level of the texture
- Tri-linear filtering UV \times map level



7

8

Procedural Textures

• Generate texture based on some function

- Well suited for "random" textures
- Often modulate some noise function





Assigning	Fexture	Coordinates

- Map a simple shape onto object by projection
 - Sphere, cylinder, plane, cube
- Assign by hand
- Use some optimization procedure

9









Bump Mapping





No bump mapping

With bump mapping

Images by Paul Baker www.paulsprojects.net





Bump Map Example



Catherine Bendebury and Jonathan Michaels CS 184 Spring 2005





Environment Maps		
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Environment maps allow crude reflections	-	
 Treat object as infinitesimal Reflection only based on surface normal 	-	
• Errors hard to notice for non-flat objects	-	
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Shadow Maps

- Pre-render scene from perspective of light source
- Only render Z-Buffer (the shadow buffer)
- Render scene from camera perspective
- Compare with shadow buffer
- If nearer light, if further shadow

23





Deep Shadow Maps

• Some objects only partially occlude light

- A single shadow value will not work
- Similar to transparency in Z-Buffer





From Lokovic and Veach SIGGRAPH 2000

25