Textures

C. Andrews

Simplest texture mapping

t, s

u, v

x, y
General texture mapping

Angel, fig 7.5

Angel, fig 7.6
Aliasing

Angel, fig 7.7

GPU Gems, fig 25-1
Sampling from the texture

point sampled (nearest)

linear filtering
Minification vs. magnification

Angel, fig 7.17

Minification

Magnification
Mipmapping

[Diagram showing mipmaps of a textured surface at different resolutions: 256x256 (LOD0), 128x128 (LOD1), 64x64 (LOD2), 32x32 (LOD3), with a logo for Tom's Hardware Guide in the top right corner.]

http://www.tomshardware.com/reviews/ati.819-2.html
Mipmapping

(a) point sampling
(b) linear filtering
(c) mipmapped point sampling
(d) mipmapped linear filtering

Angel, fig 7.18
Mipmapping

http://www.tomshardware.com/reviews/ati,819-4.html
Mapping textures to shapes

Angel, fig 7.9
Sphere mappings

Mercator

You're not really into maps.

Plate Carrée (Equirectangular)

You think this one is fine. You like how x and y map to latitude and longitude. The other projections overcomplicate things. You want me to stop asking about maps so you can enjoy dinner.

Winkel-Tripel

National Geographic adopted the Winkel-Tripel in 1998, but you've been a WFT fan since long before "Nat Geo" showed up. You're worried it's getting played out, and are thinking of switching to the Kavraisky. You once left a party in disgust when a guest showed up wearing shoes with toes. Your favorite musical genre is "Post-".

Hobo-Dyer

You want to avoid cultural imperialism, but you've heard bad things about Gall-Peters. You're conflict-averse and buy organic. You use a recently-invented set of gender-neutral pronouns and think that what the world needs is a revolution in consciousness.

http://en.wikipedia.org/wiki/File:Sphere_wireframe_10deg_6r.png

http://xkcd.com/977/
Mapping to an intermediate object
Diffuse texture maps

http://www.nordicfx.net/
Decals

Skin

http://www.livingautomaton.com/3d-work/bale-bust-sculpt/
Billboarding

Texture mapped fonts

http://home.pacific.net.hk/~edx/texfont.htm
http://www.tinrocket.com/superspritesurface/
Bump mapping


http://tom.drastic.net/stuff/mudbox--3ds-max/
Displacement mapping

- **Base Model**
- **Bump Mapping**
- **Displacement Mapping**

Image courtesy of www.chromesphere.com

http://www.nvidia.com/object/tessellation.html
Luminance or light maps

http://xonotic.org/posts/2012/xonotic-0-6-is-now-available/
Environment mapping

http://www.cs.cmu.edu/~462/lectures/EnvMap.pdf
Sky box

http://ogldev.atspace.co.uk/www/tutorial25/tutorial25.html
Shadow maps

Distances stored in a texture
("shadow map")

Projected shadow

http://www.opengl-tutorial.org/intermediate-tutorials/tutorial-16-shadow-mapping/
Shadow maps

http://www.opengl-tutorial.org/intermediate-tutorials/tutorial-16-shadow-mapping/