Rendering and “Photorealism”
This is not a pipe.
photorealism - art movement of the 1960s and 70s

*Big Self-portrait (1968)*, Chuck Close
REALITY

person

REPRESENTATION

photograph

painting
“photo-realism” - intention of most 3D rendering

http://www.asai.org/
REALITY

building

REPRESENTATION

photograph

3D model

rendering
“Synthetic computer-generated imagery is not an inferior representation of our reality, but a realistic representation of a different reality.”

- Lev Manovich (2001), *The Language of New Media*
Where does this fit in “The Arrested Image”?
The successive phases of the image:

1. It is the reflection of a basic reality.

2. It masks and perverts a basic reality.

3. It masks the absence of a basic reality.

4. It bears no relation to any reality whatever: *it is its own pure simulacrum.*
Ray Winstone

2000 - reality

2007 - representation?
rotoascoping

Waking Life, Richard Linklater, 2001
roto
coping

http://www.youtube.com/watch?v=RMWXyEHoN88

“Take on Me” music video, a-ha, 1985
HIDDEN-LINE VIEW - produces a vector image

slow process yielding coordinate data by determining where opaque polygons “cut” lines and edges

17 visible line segments
6 hidden line segments

HIDDEN-SURFACE VIEW - produces a raster image

ie: “PAINTER’S ALGORITHM”

relatively fast process yielding bitmap data by sorting and drawing visible polygons from furthest back to furthest forward in the picture plane

3 visible planes

WIREFRAME VIEW
3D RENDERING

Real-time rendering: for interactive media (games, simulators, modeling programs), usually polygonal and not intended to be photo-realistic.

Non-real-time rendering (prerendering): used in feature films and architectural competitions, photo-realistic renders employ one of the following techniques:

- **scanline rendering** - considers the objects in the scene and projects them to form an image with no facility for generating a perspective effect.

- **ray tracing** - considers the scene as observed from a specific point-of-view, calculating the observed image based only on geometry and very basic optical laws of reflection intensity.

- **radiosity** - uses finite element mathematics to simulate diffuse spreading of light from surfaces.

- **unbiased** - rendering equations based on physical equations of light transport.
10 Principles of 3D Photorealism:

1. Clutter and Chaos
2. Personality and Expectations
3. Believability
4. Surface Texture
5. Specularity (Reflectivity)
6. Dirt, Dust, and Rust
7. Flaws, Scratches, and Dings
8. Beveled Edges
9. Object Material Depth
10. Radiosity

- Bill Fleming (1998), *3D Photorealism Toolkit*
marketing

Harvard University Northwest Science Building, SOM
marketing

http://www.thechicagospire.com/
“Regardless of their design philosophy, architects try to capture the less tangible effects of a construction, waving their hands around representations of their projects like impassioned spiritualists, drawing invisible lines of force and predicting the arrival of certain intangible qualities.”

“The viewer of the drawing is meant to experience something of the building’s atmosphere. Drawings are atmosphere simulators and even the most abstract lines produce sensuous, unpredictable effects.”

Frank Lloyd Wright (1935)
Fallingwater, perspective
Frank Lloyd Wright (1952)
Price Office Tower, perspective
Frank Lloyd Wright (1939)
Georges Sturges House perspective
Frank Lloyd Wright (1945)
“The Wave” House, perspective
Case Study House REDUX
QUIZ 9
Diller, Scofidio, & Renfro, with Field Operations

*The High Line* (to be finished 2008-9)
Lewis, Tsurumaki, Lewis (2001)
*Fremont Hotel - Prototype Room*
Lewis, Tsurumaki, Lewis (2004)
Park Tower (speculation)
Ball Nogues Studio (2006)
Lexus Environmental Advertisement