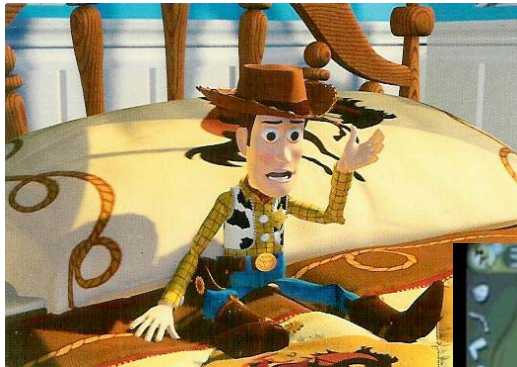


CS148: Introduction to Computer Graphics and Imaging

**Pat Hanrahan
Winter 2007**

Motivation

Entertainment



Movies

Toy Story, PIXAR



Games

Spore, W. Wright

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Computer-Aided Design; Training

Computer-aided design

Electronic blueprints

Architectural CAD

Mechanical CAD

Electronic CAD

Sketchup



Visual simulation and Training

Apollo spacecraft

Flight simulators

Ship

Automobile and driving simulators

Surgical simulation



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Digital Media Technologies

Traditional media (analog to digital transition)

Desktop publishing and printing

Digital photography

Digital video and HDTV

“New” media experiences

Multimedia personal computer

Networked graphics and the www

Photo (flickr) and video sharing (youTube)

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Graphical User Interfaces

Desktop metaphor

Input: Lightpen, mouse, keyboard

Output: CRT

Sutherland's Sketchpad
1960's



Xerox Alto
1970's



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Virtual Reality

Immersive interfaces

Input: 3D tracking, gloves

Output: HMD, projection display



Head-mounted display
Mechanical tracker



Responsive Workbench
Magnetic tracker

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Visualization

Mathematics, science, engineering, medicine, ...

Education



The Visible Man, K. H. Hoehne

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Outside In, The Geometry Center

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Interdisciplinary: Theory & Practice

Science

- Physics of light, color and appearance
- Geometry and perspective
- Mathematics of curves and surfaces

Engineering

- Hardware: Graphics/media processors
- Software: Graphics libraries, window systems

Art and Perception

- Color: harmony and perception
- Composition, lighting, ...

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Innovation in Platforms

Game and Enthusiast Machines

e.g. Alienware, XBOX-360, PS3



Personal computer

e.g. Macbook



Consumer electronics

e.g. HDTV, PVR, Set-top box



Handhelds

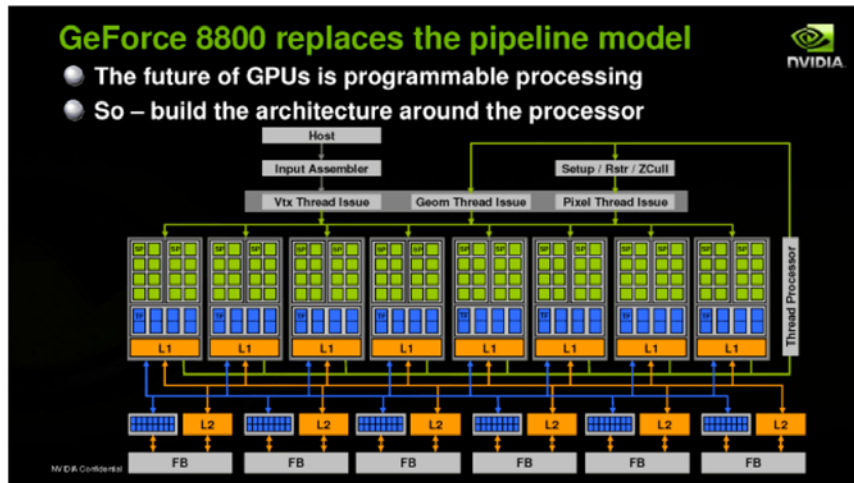
e.g. Cell-phone, PSP



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Innovation in Hardware and Software

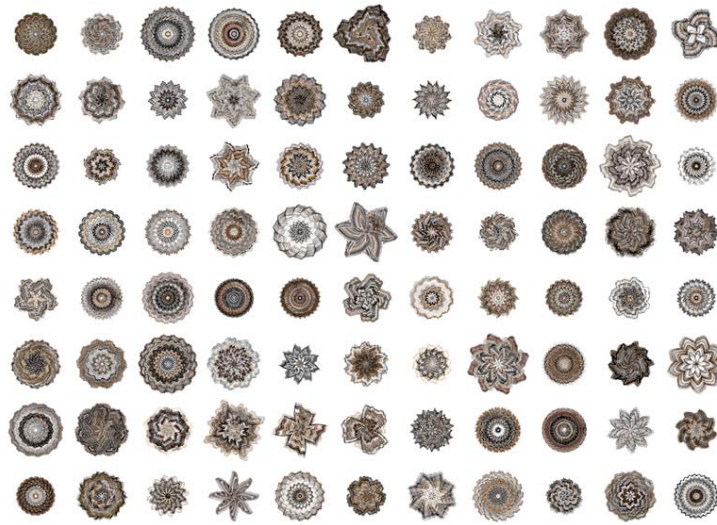


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Topics

Drawing



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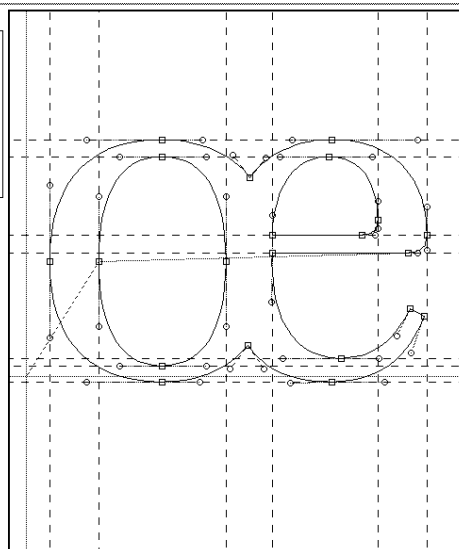
Sand Dollar - J. Tared 2004

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Typography and Page Layout

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Input Devices and Interactive Techniques



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Digital Cameras



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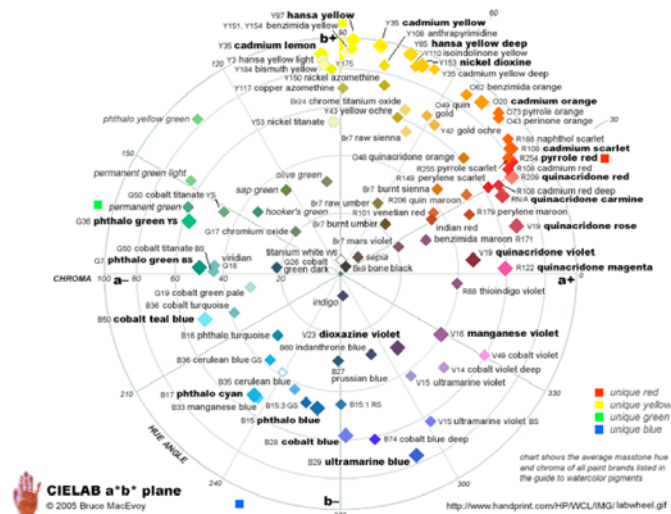
Displays



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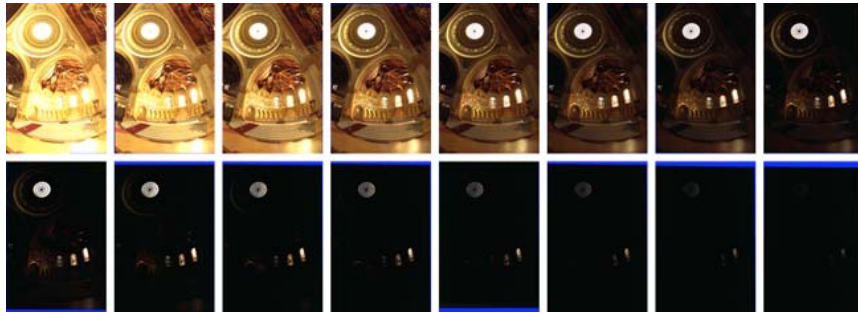
Light and Color



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Exposure and Tone Reproduction



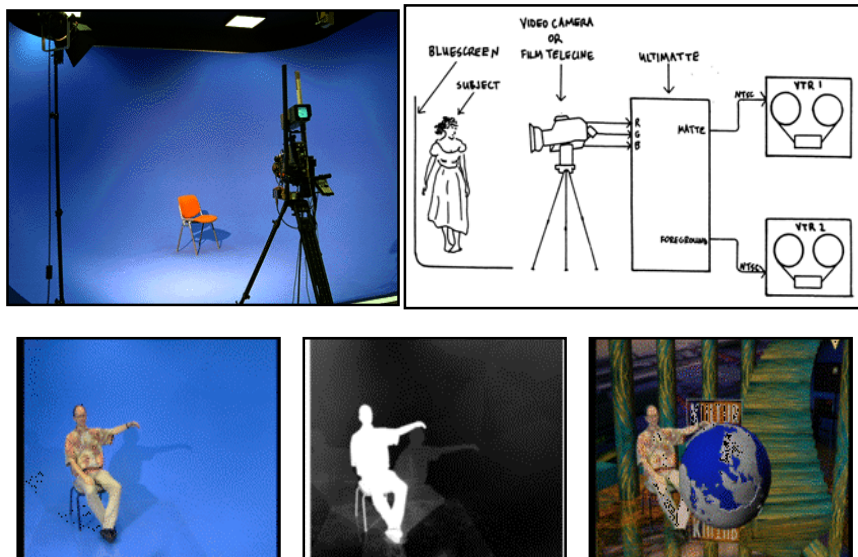
Sixteen photographs of the Stanford Memorial Church taken at 1-stop increments from 30s to 1/1000s.

From Debevec and Malik, High dynamic range photographs.

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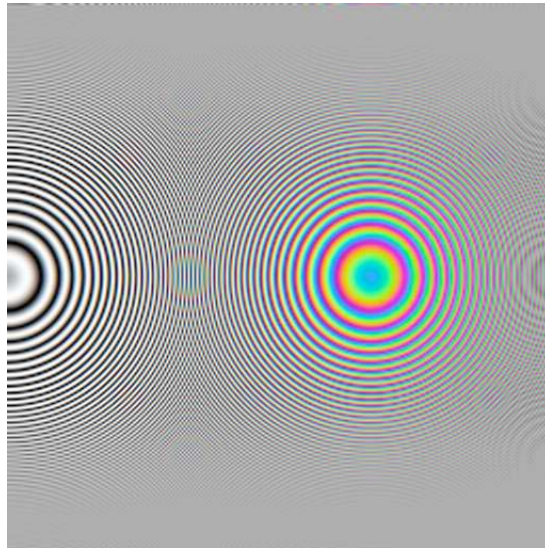
Mattes, Layers, and Compositing



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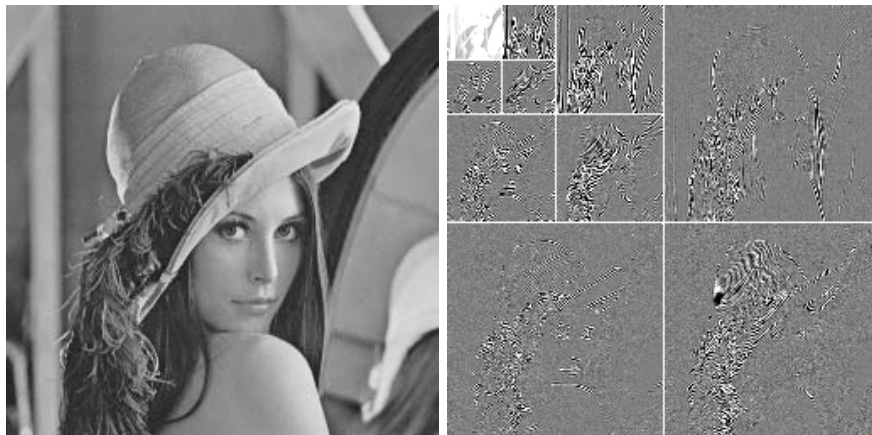
Filtering and Sampling



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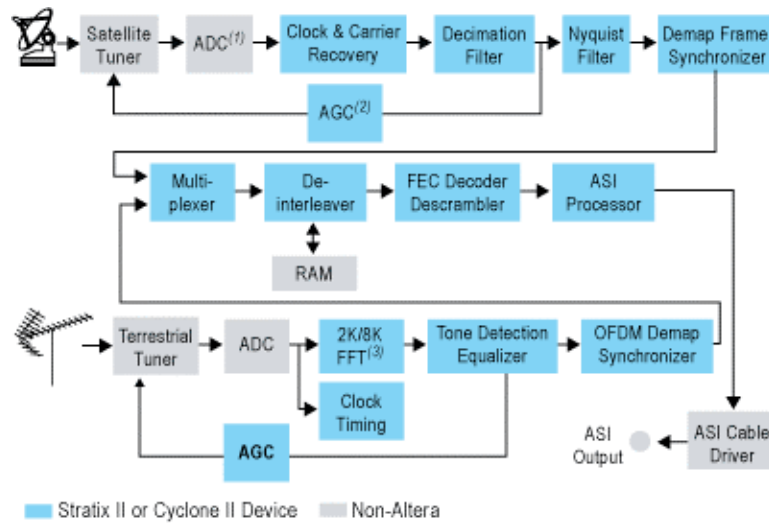
Compression



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Digital Video and HDTV



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Modeling and Rendering



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Animation



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