

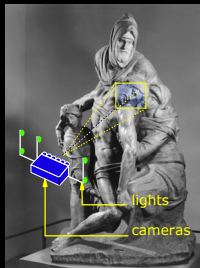
EN193-S08 3D Photography
<http://www.lems.brown.edu/~taubin/en193s08>

**CLASS WILL MEET IN
B&H-092 MULTIMEDIA ROOM**

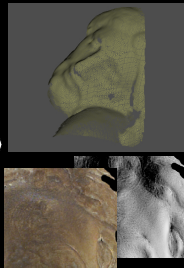
Gabriel Taubin
taubin@brown.edu

04 Sep 2003

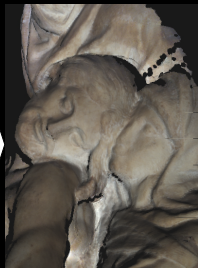
Capture and Reconstruction



Multiple digital
photographs are
taken



Surface shape, color
and details are
computed for each
scan



Scans are aligned
and merged

One of three Pietà, the
others are in the
Vatican and in Milan

Created by Michelangelo
late in his life
1550

Michelangelo broke off
pieces of the statue,
repaired by Calcagni
1555-56

Placed outside, in a
a basement
1562-1721

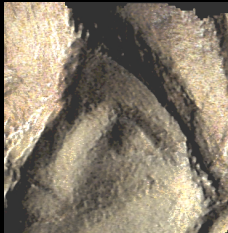
Placed in the Duomo
1721-1980

Currently in the Museum
of the Duomo
Florence, Italy



Tools we can offer

- ▶ Controlled views
- ▶ Impossible views
- ▶ Precise measurements
- ▶ Other environments
- ▶ Partial geometry
- ▶ On demand details



Pietà data capture

- ▶ 3 trips (Feb 98, June 98, July 99)
- ▶ 800+ scans
- ▶ 9600 digital pictures
- ▶ 2 minutes per scan
- ▶ 10,000 points per scan (20x20cm) from structured light system
- ▶ 2mm intersample distance (25 samples/cm²)
- ▶ 0.5mm intersample distance (400 samples/cm²) from photometric system



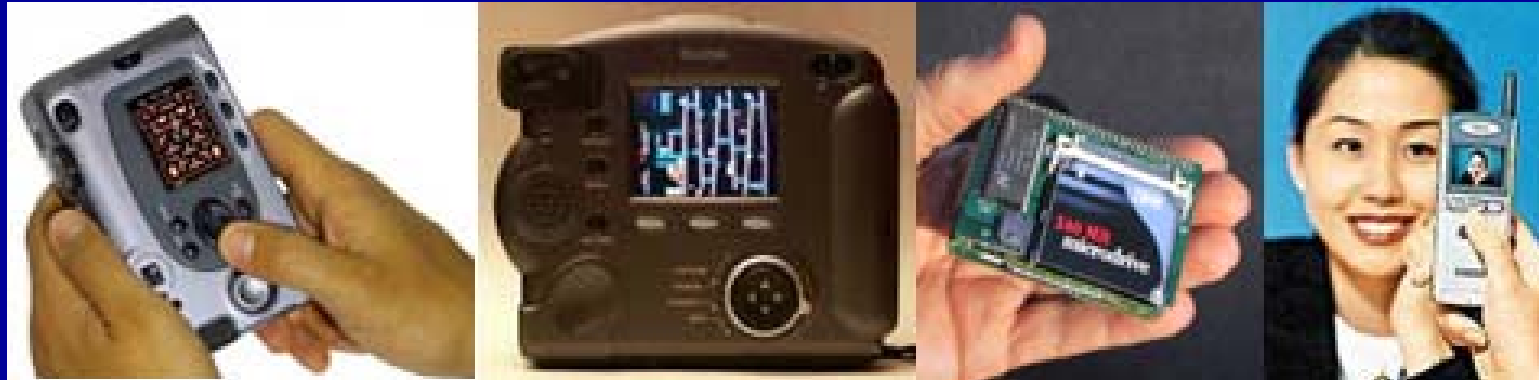








The Gadgets Lab @ CalTech



Many consumer electronics gadgets, such as PDAs, digital cameras, MP3 players and cellphones, have powerful microprocessors and memory so that they may be reprogrammed to perform tasks other than those the devices have been designed for.

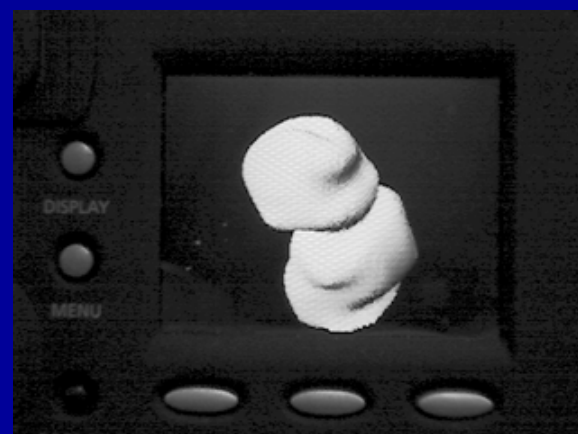
3D Digital Camera

DEMO!



- Capture Mode
- Viewer Mode

3D Digital Camera



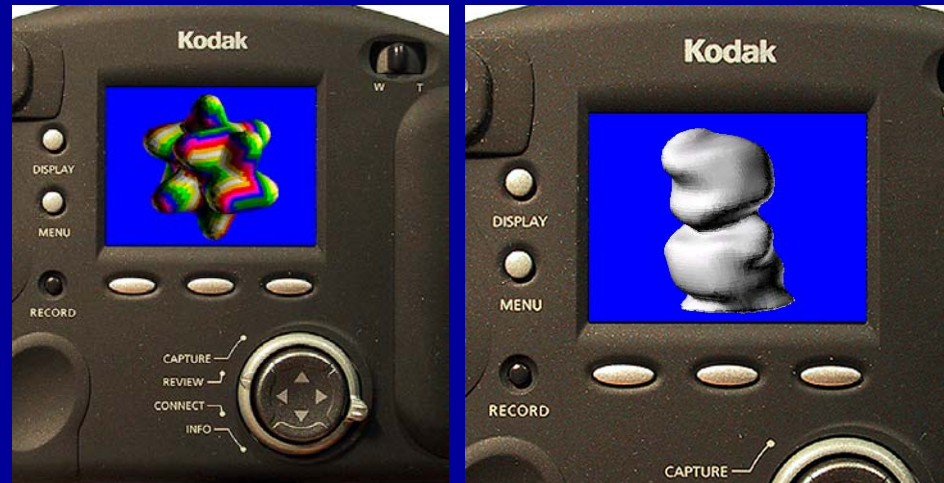
3D Digital Camera / Capture Mode

- ALL the computation done in the camera
- Volume Carving
- Turntable Control
- Isosurface Extraction
- Mesh
- Recover Color/Texture
- 3D Compress
- Save to Disk

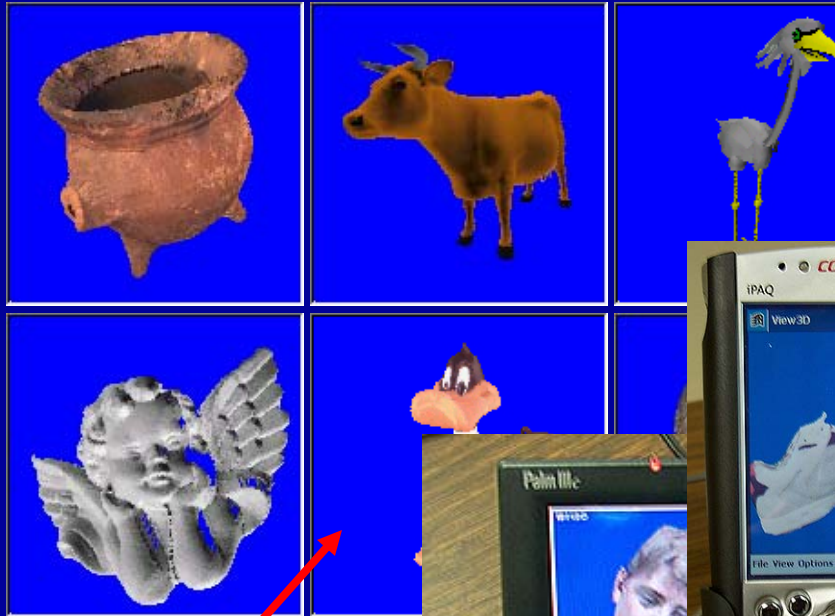


3D Digital Camera / Viewer Mode

- Open file
- Parse VRML
- Decompress MPEG-4 mesh
- Interactive 3D software rendering
- All VRML property bindings and shading modes supported



3D Viewer



IBM Hotmedia
(Java)

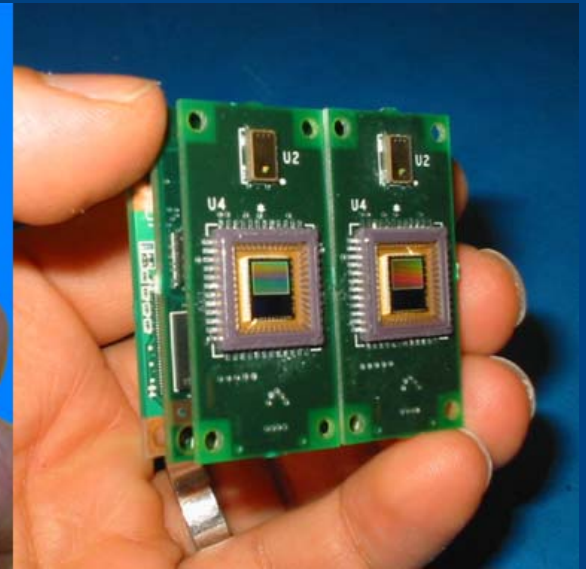
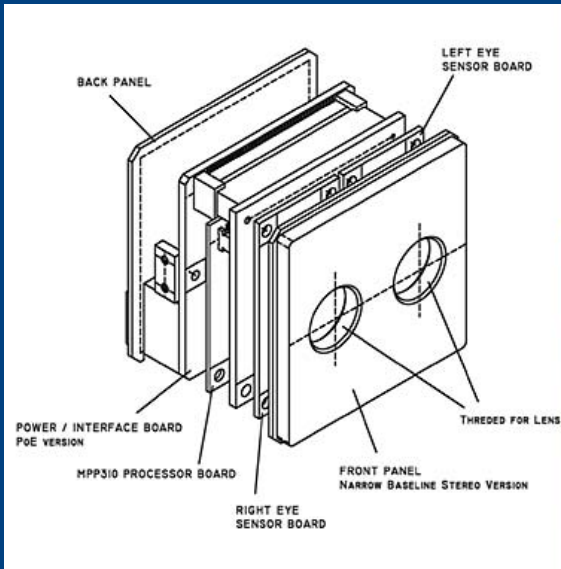
Palm OS



PocketPC



SMART CAMERAS



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