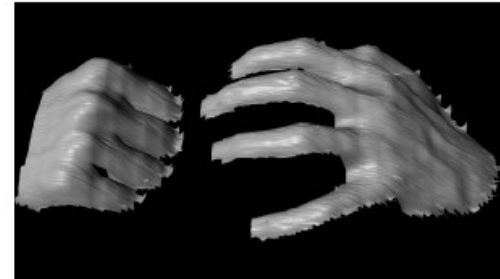


Stereo-like active depth

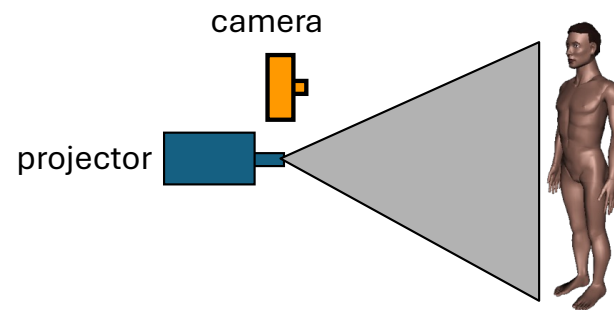
D.A. Forsyth

University of Illinois at Urbana Champaign

Active stereo with structured light

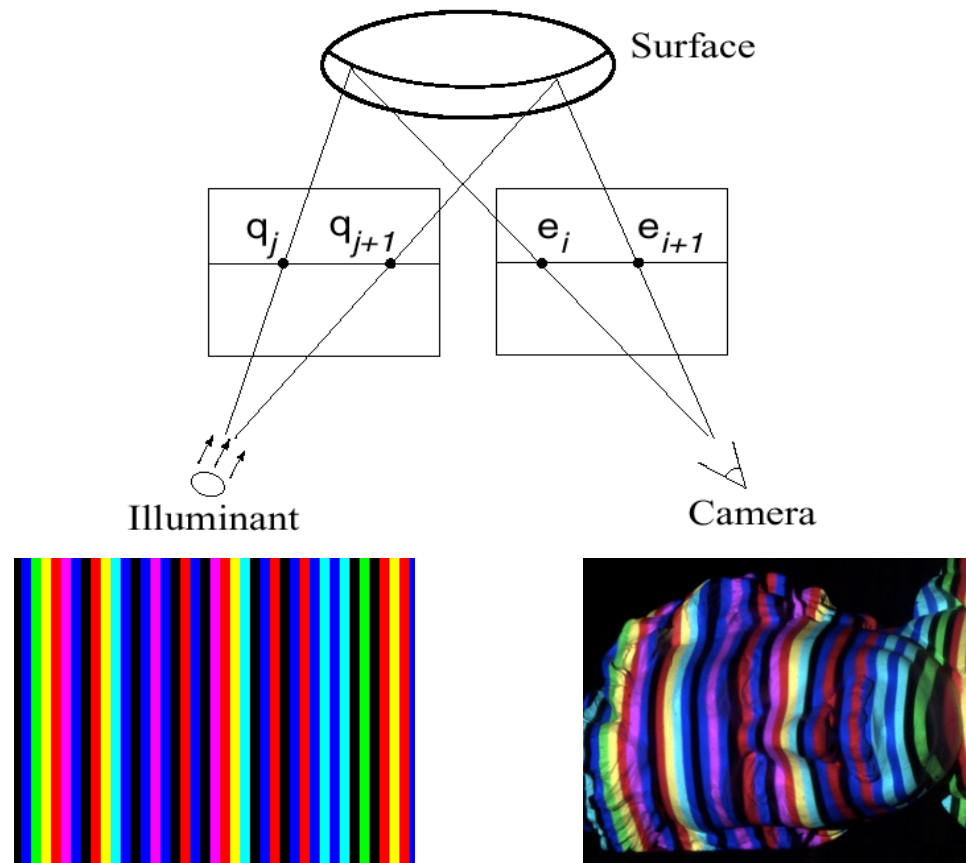


- Project “structured” light patterns onto the object
 - Simplifies the correspondence problem
 - Allows us to use only one camera



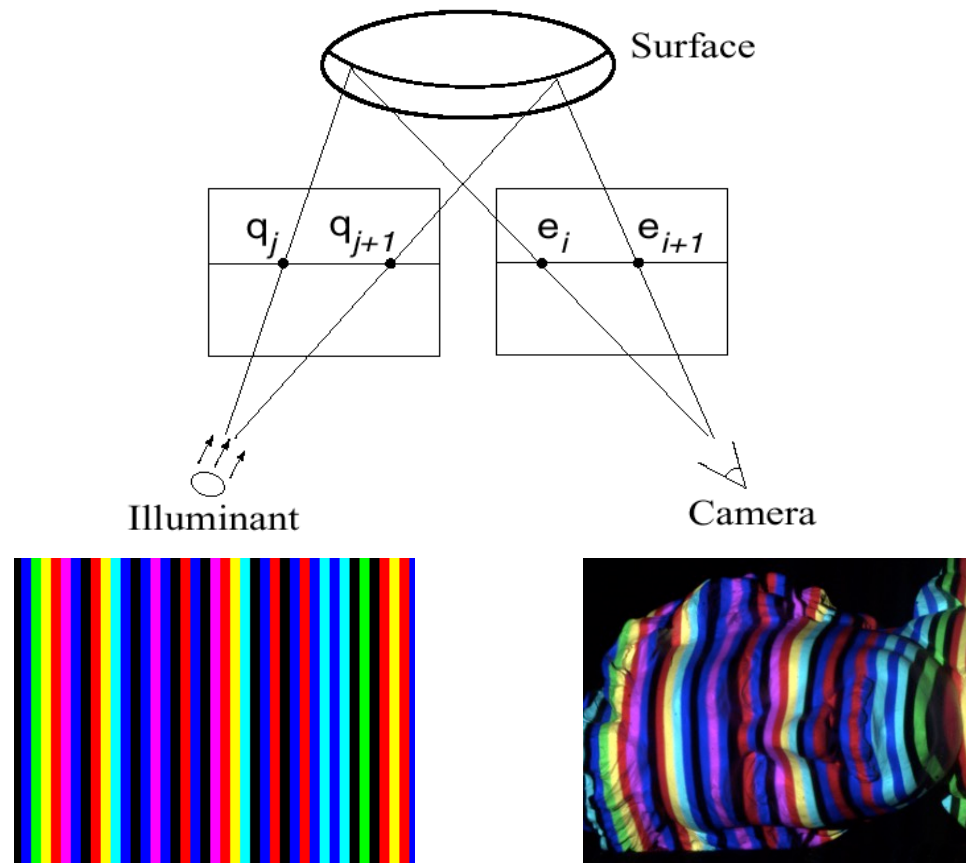
L. Zhang, B. Curless, and S. M. Seitz. [Rapid Shape Acquisition Using Color Structured Light and Multi-pass Dynamic Programming](#). *3DPVT 2002*

Active stereo with structured light



L. Zhang, B. Curless, and S. M. Seitz. [Rapid Shape Acquisition Using Color Structured Light and Multi-pass Dynamic Programming](#). *3DPVT 2002*

Active stereo with structured light



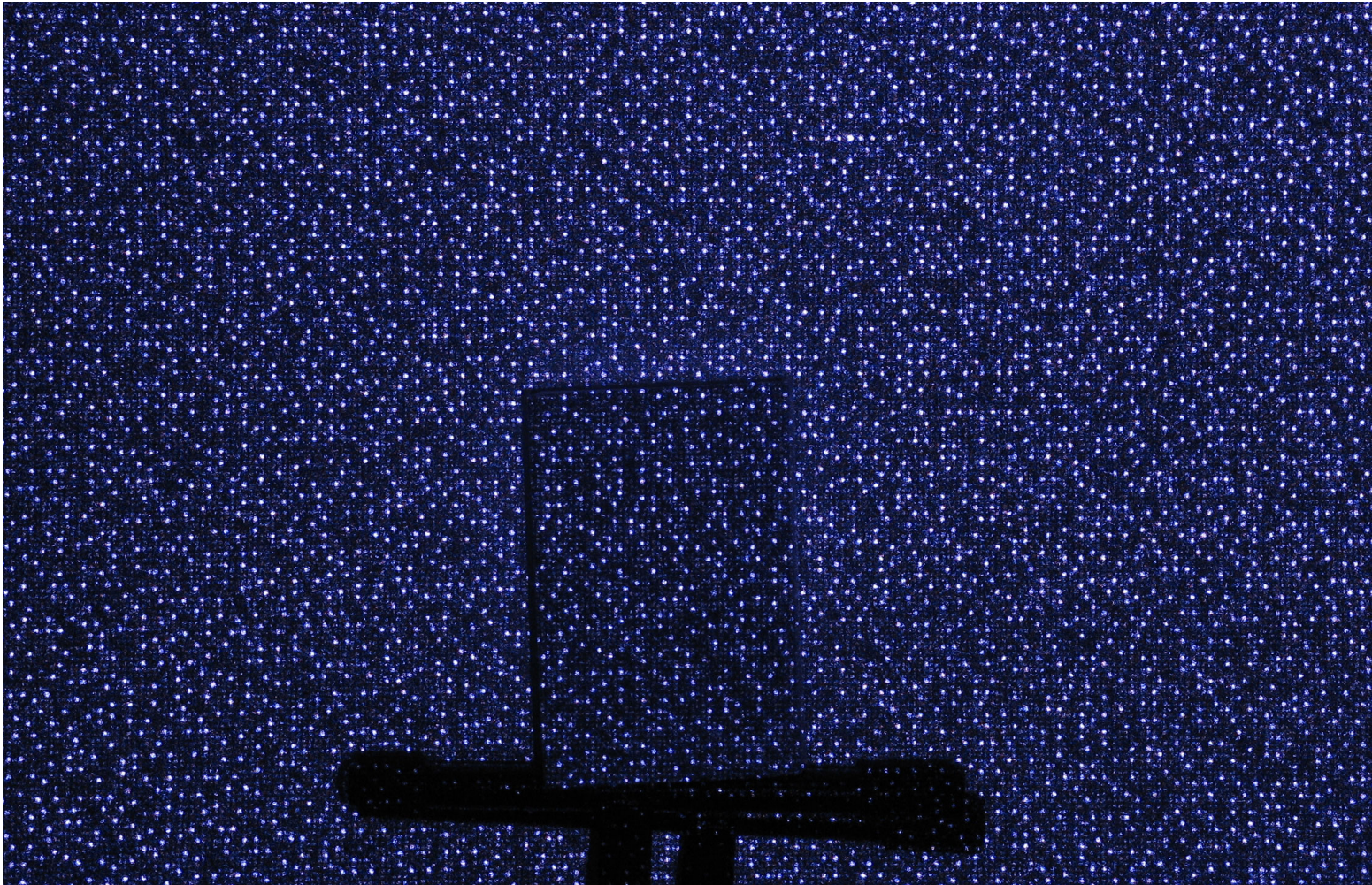
http://en.wikipedia.org/wiki/Structured-light_3D_scanner

Kinect: Structured infrared light



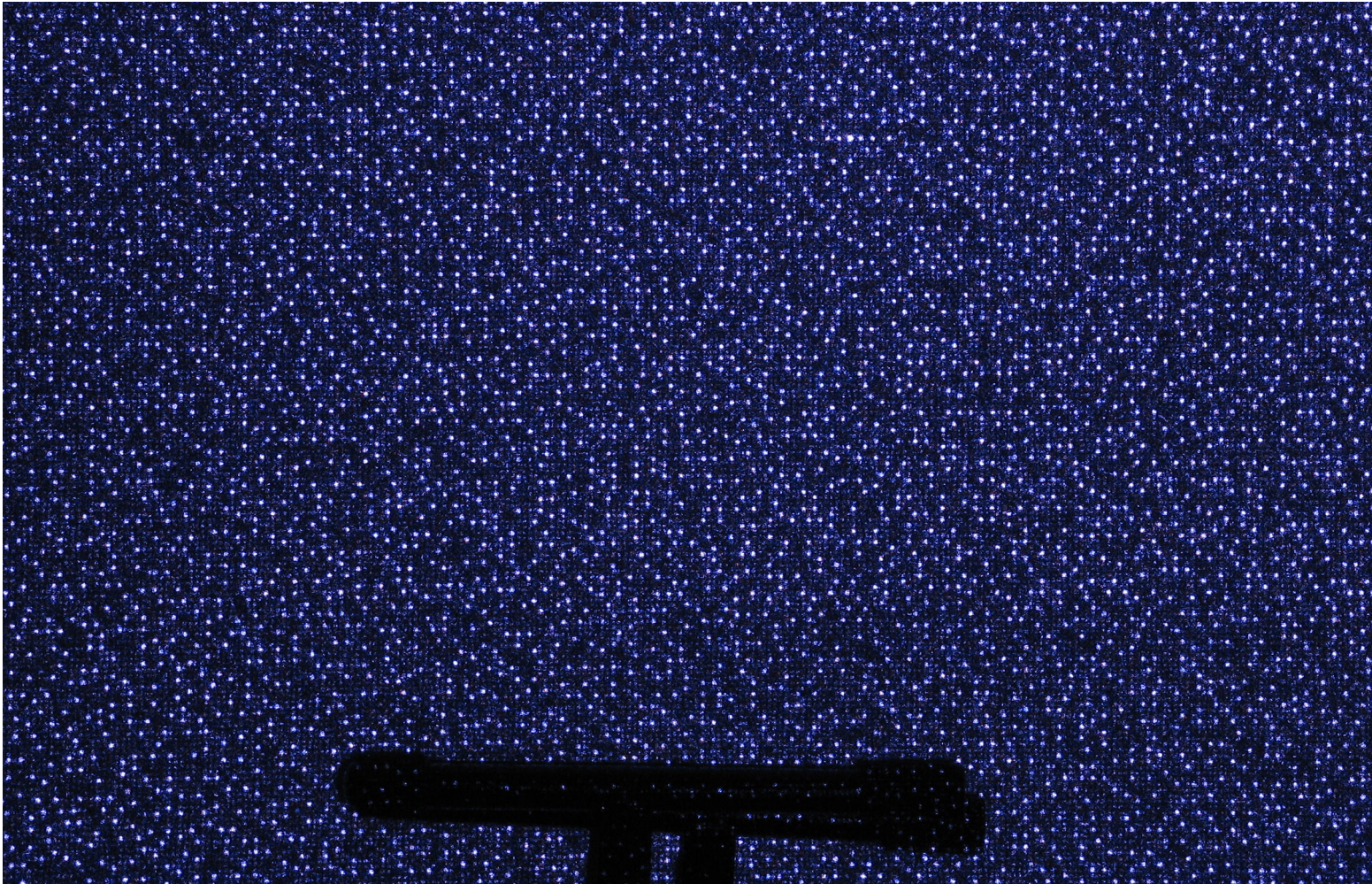
<http://bbzipo.wordpress.com/2010/11/28/kinect-in-infrared/>

Example: Book vs. No Book



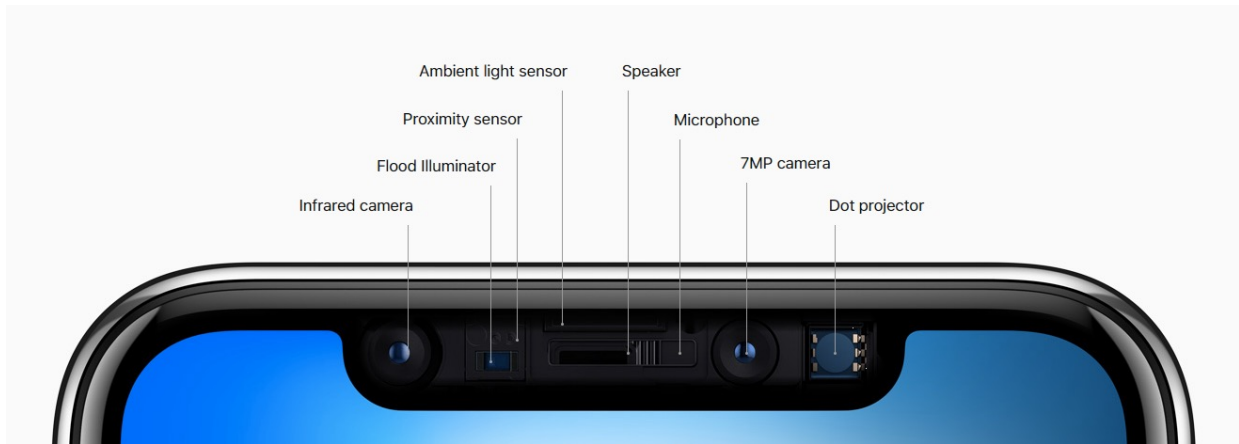
[Source](#) (via D. Hoiem)

Example: Book vs. No Book



[Source](#) (via D. Hoiem)

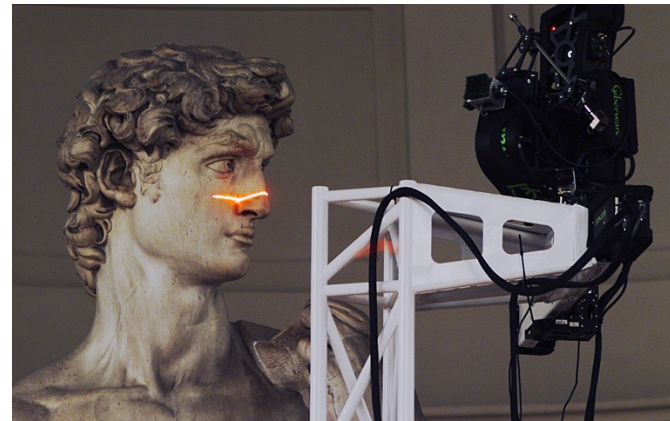
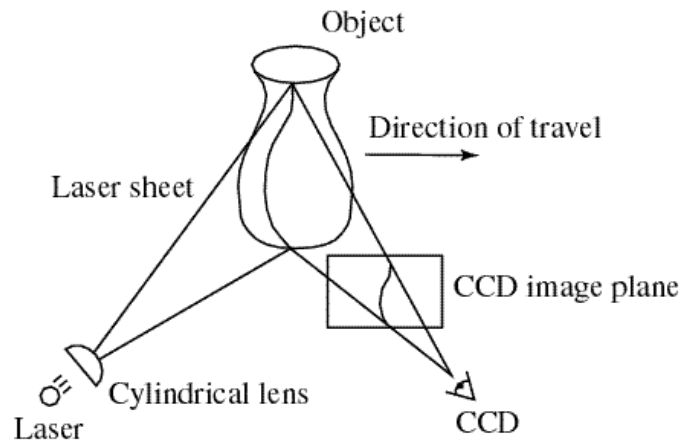
Apple TrueDepth



<https://www.cnet.com/news/apple-face-id-true-depth-how-it-works/>



Laser scanning



Digital Michelangelo Project
Levoy et al.

<http://graphics.stanford.edu/projects/mich/>

- Optical triangulation
 - Project a single stripe of laser light
 - Scan it across the surface of the object
 - This is a very precise version of structured light scanning

Source: S. Seitz

Laser scanned models



The Digital Michelangelo Project, Levoy et al.

Source: S. Seitz

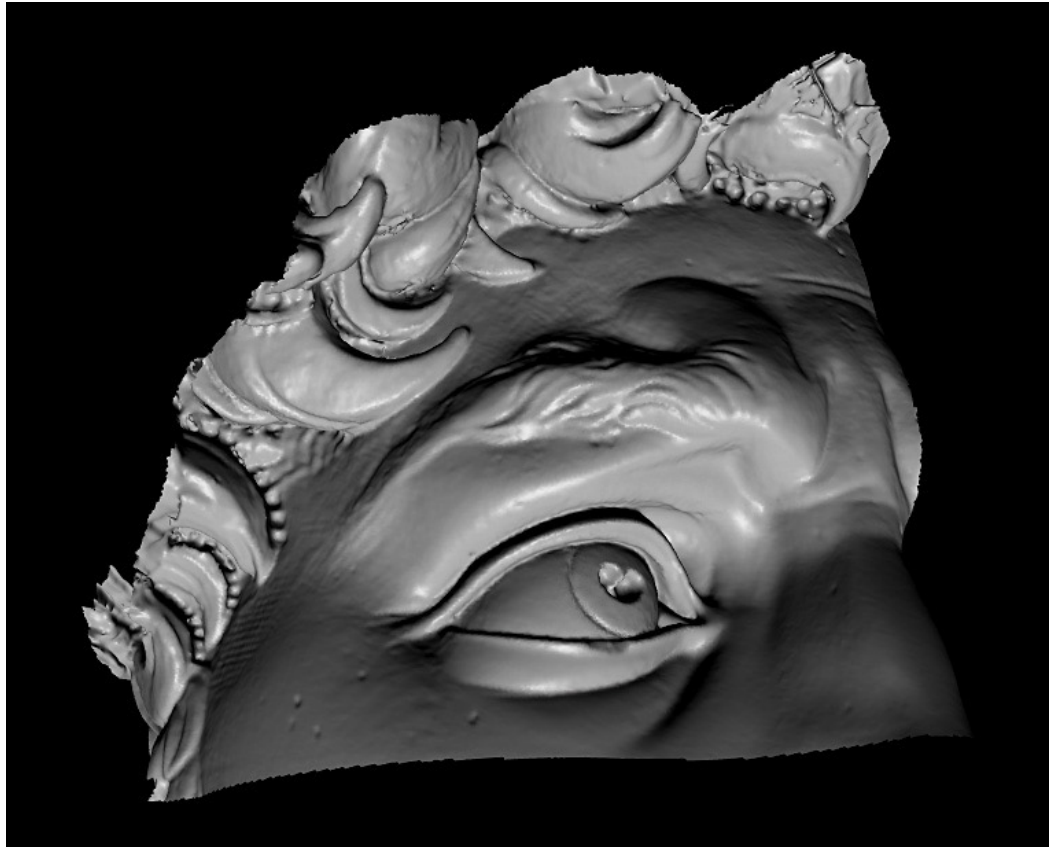
Laser scanned models



The Digital Michelangelo Project, Levoy et al.

Source: S. Seitz

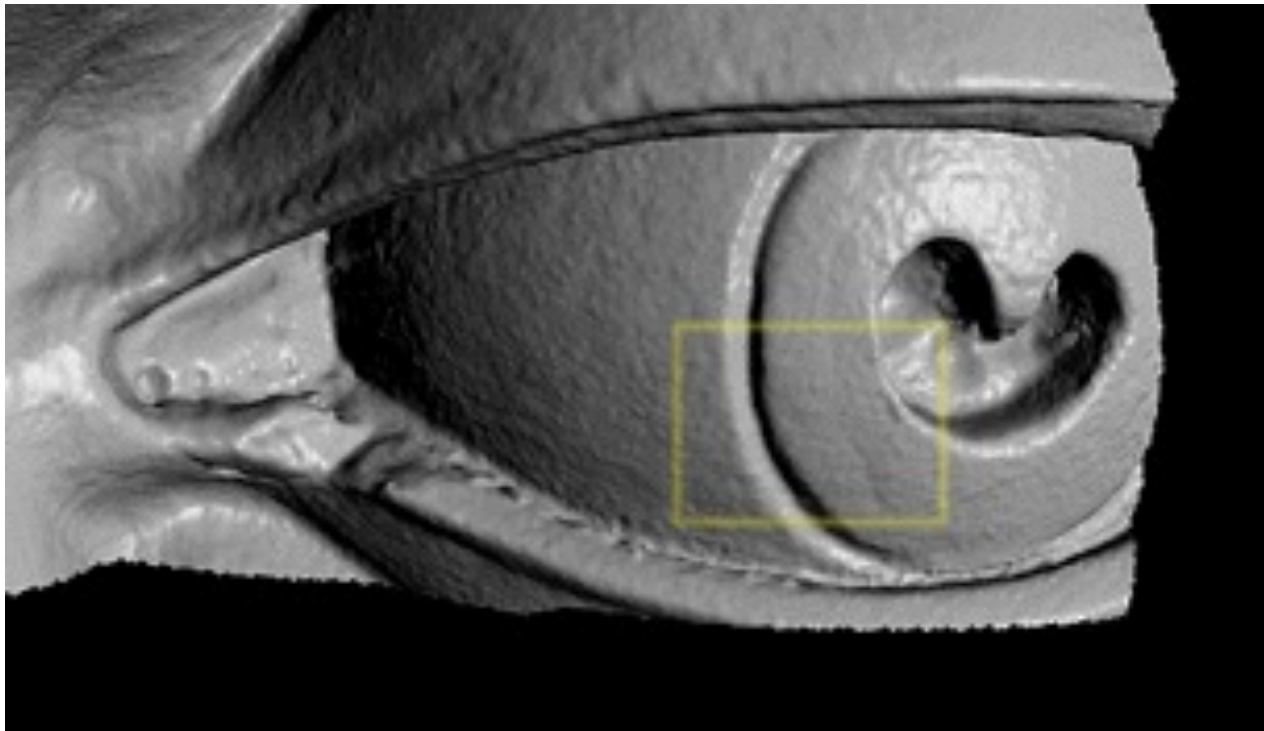
Laser scanned models



The Digital Michelangelo Project, Levoy et al.

Source: S. Seitz

Laser scanned models

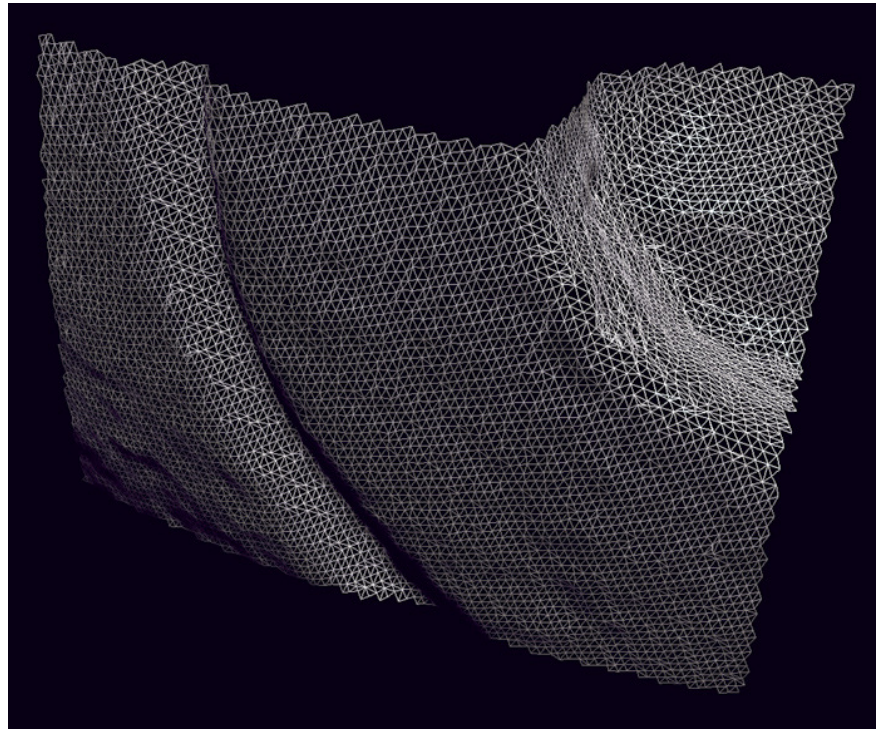


The Digital Michelangelo Project, Levoy et al.

Source: S. Seitz

Laser scanned models

1.0 mm resolution (56 million triangles)

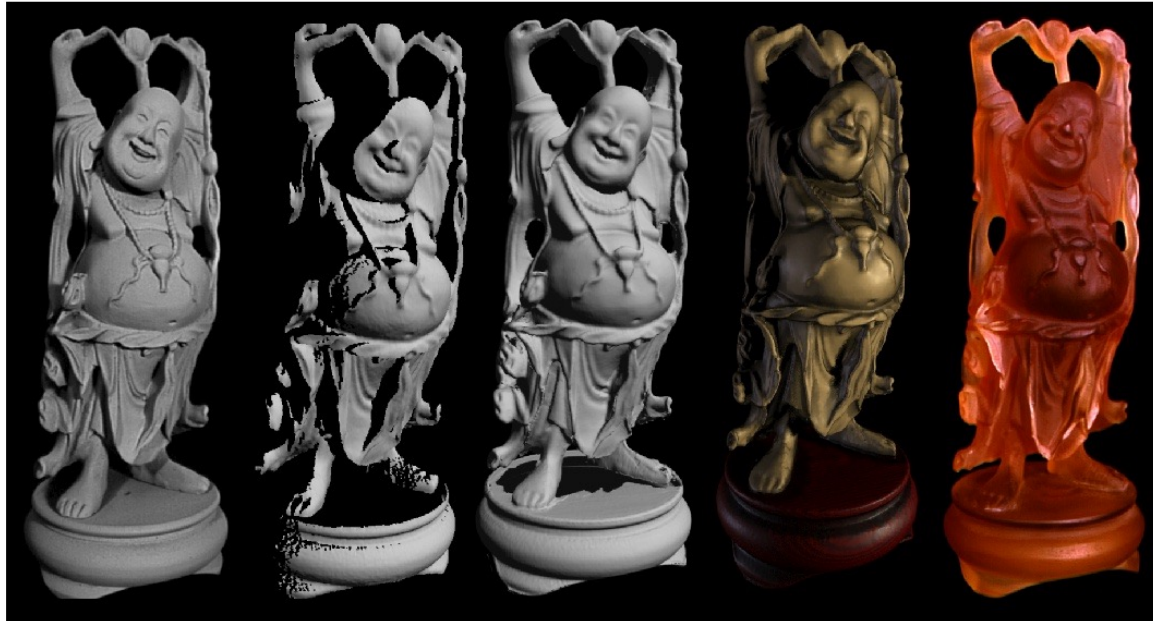


The Digital Michelangelo Project, Levoy et al.

Source: S. Seitz

Aligning range images

- A single range scan is not sufficient to capture a complex surface
- Need techniques to register multiple range images



B. Curless and M. Levoy, [A Volumetric Method for Building Complex Models from Range Images](#), SIGGRAPH 1996

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