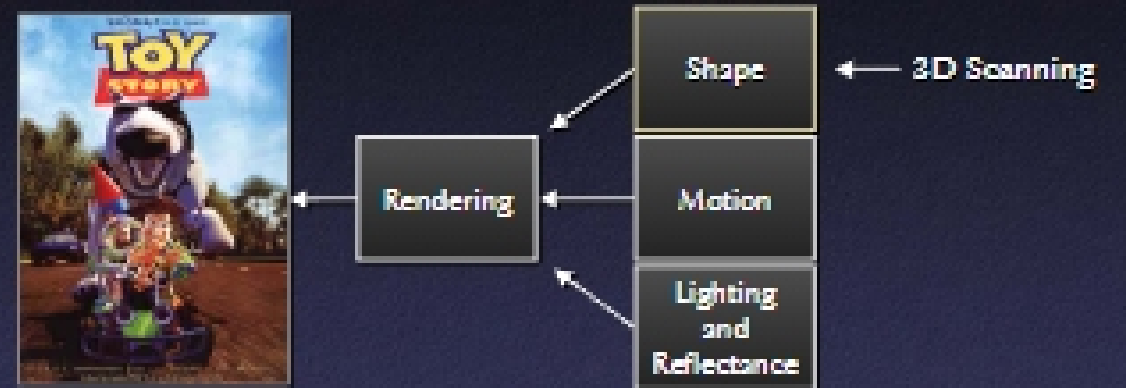


3D Scanning

Szymon Rusinkiewicz
Princeton University
COS 426 Guest Lecture
Spring 2003

Computer Graphics Pipeline



- Human time = expensive
- Sensors = cheap
 - Computer graphics increasingly relies on measurements of the real world

3D Scanning Applications

- Computer graphics
- Product design
- Product inspection
- Archaeology
- Robot navigation
- Clothes fitting
- As-built floorplans
- Art history

Industrial Inspection

- Determine whether manufactured parts are within tolerances



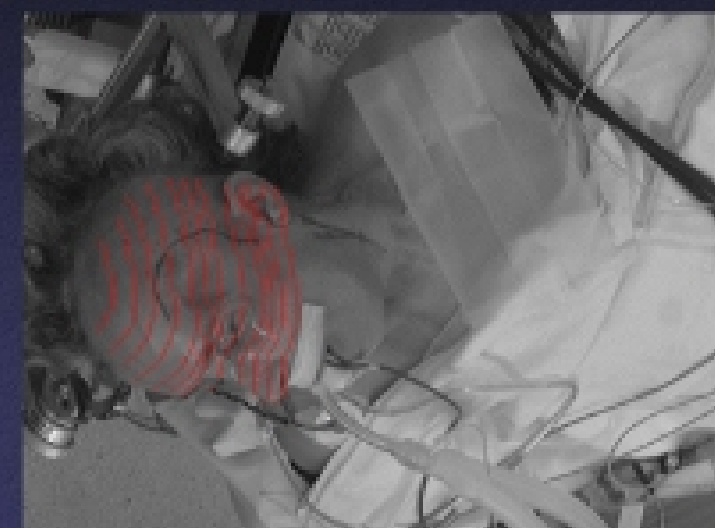
Medicine

- Plan surgery on computer model, visualize in real time



Medicine

- Plan surgery on computer model, visualize in real time



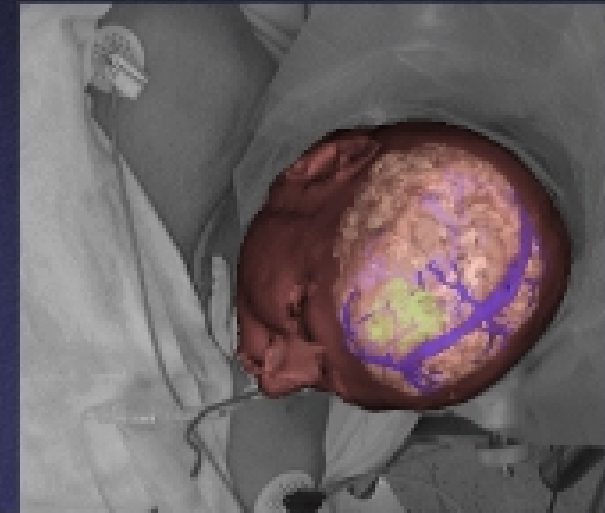
Medicine

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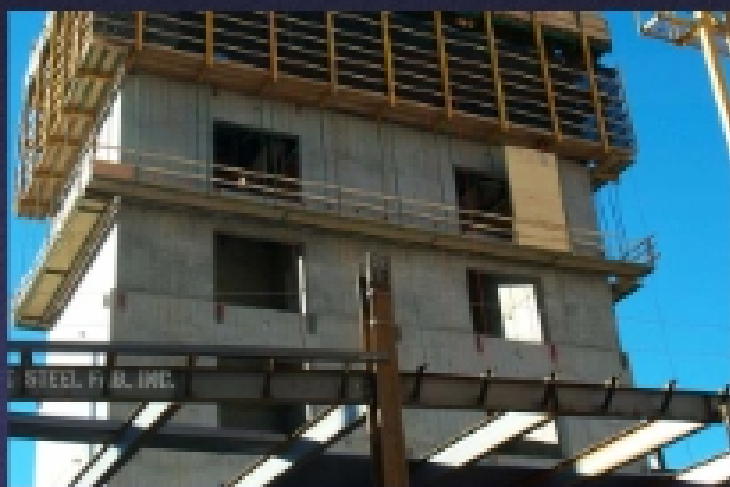
Medicine

- Plan surgery on computer model, visualize in real time



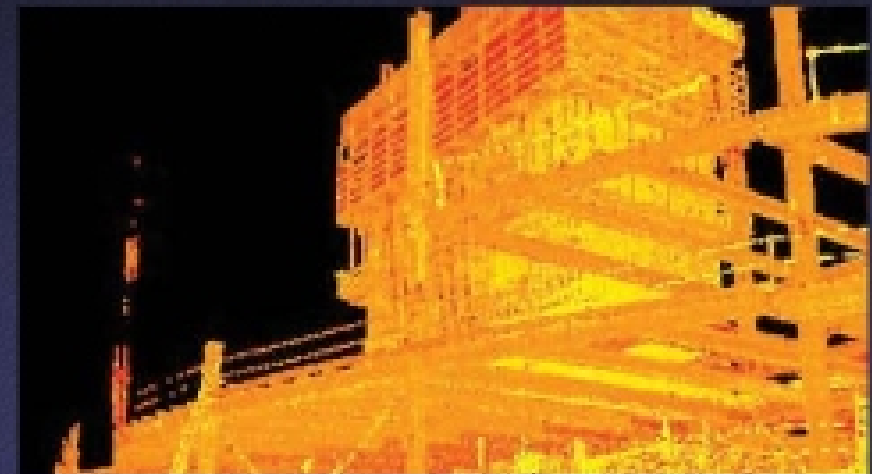
Scanning Buildings

- Quality control during construction
- As-built models



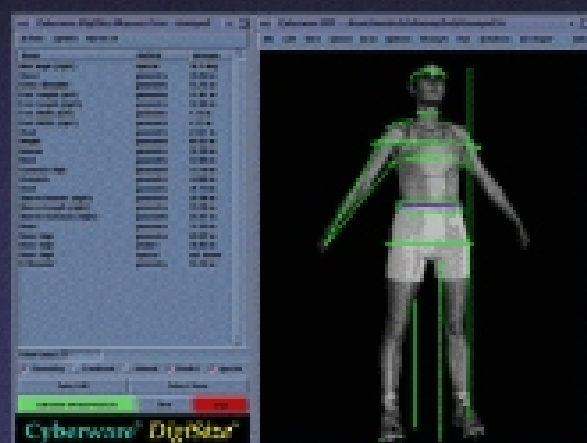
Scanning Buildings

- Quality control during construction
- As-built models



Clothing

- Scan a person, custom-fit clothing
- U.S. Army; booths in malls



The Digital Michelangelo Project



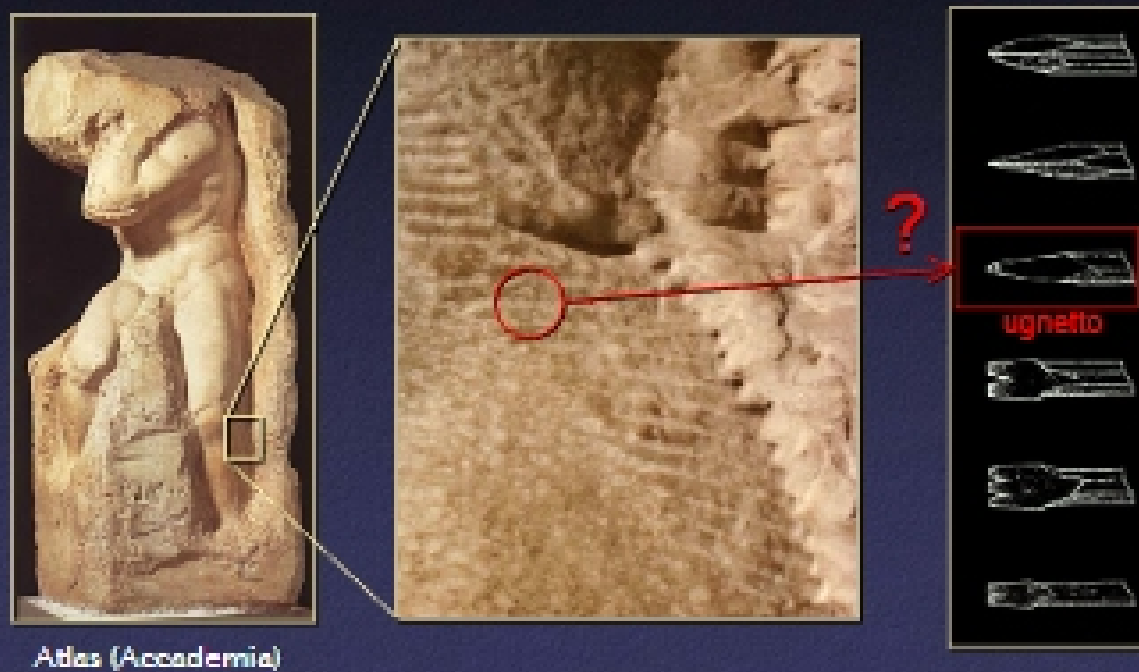
Why Scan Sculptures?

- Sculptures interesting objects to look at
- Introduce scanning to new disciplines
 - Art: studying working techniques
 - Art history
 - Cultural heritage preservation
 - Archeology
- High-visibility project

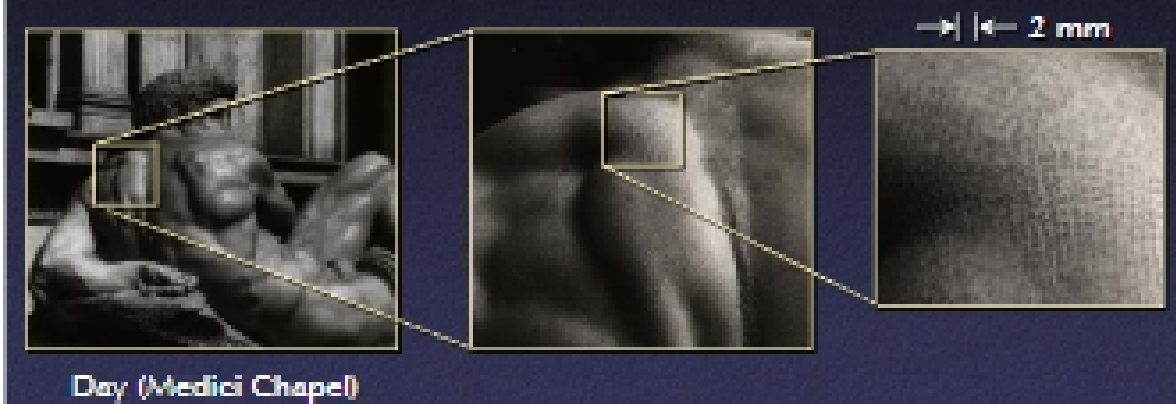
Goals

- Scan 10 sculptures by Michelangelo
- High-resolution ("quarter-millimeter") geometry
- Side projects: architectural scanning (Accademia and Medici chapel), scanning fragments of Forma Urbis Romae

Why Capture Chisel Marks?



Why Capture Chisel Marks as Geometry?



Side project: The Forma Urbis Romae



Forma Urbis Romae Fragment

