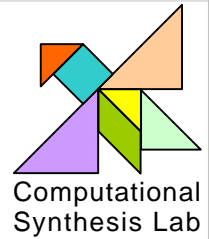


Faxing Artifacts

The promise of three-dimensional scanning and rapid prototyping of archaeological materials

Evan Malone
Mechanical and Aerospace Engineering
evan.malone@cornell.edu



Many nations do not allow export of faunal remains and other archaeological materials.

Photographs, drawings, and measurements made in the field fail to capture many key details of these unique items.

Portable, 3-D scanners enable the capture - in the field - of highly accurate and photorealistic digital 3D models of archaeological materials.

Rapid Prototyping (RP) technologies build objects by computer-controlled addition of material, layer by layer, allowing highly accurate replication of these materials from digital models.

Together, these technologies enable the creation of digital databases of archaeological materials with on-demand, low-cost physical replication:

"Faxing of Artifacts"

New 3D Scanning Tech:

- > Portable (2.5kg, 10cmX20cmX25cm)
- > Simple (USB, GUI interface)
- > Accurate (+/-150µm)
- > No limit to object size
- > ~5 minutes per scan, ~20MB file
- > Shape and appearance registered



Produce accurate 3D models of your archaeological materials in the field for \$3000!

Accurately replicate any object in 1-3 days for a few hundred dollars!



NextEngine 3D Scanner
www.nextengine.com

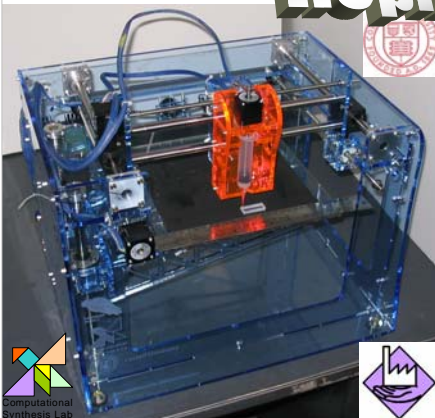


3D Modeling Software, \$0 ~ \$1000

RP Technologies:

- > Fast (1-3 day contract service)
- > Inexpensive (~ \$2 / cubic cm)
- > Accurate (+/- 100µm)
- > Color replication possible
- > Rubber, plastics, ceramics, metals
- > New desktop RP machines becoming available (\$200-\$10k)

Replicate



Fab@Home Kit, \$2200
www.fabathome.org



Contract RP Services, 1-3 days, \$100-\$500
www.xpress3d.com

References:

- D'Urso et al., Stereolithographic (SL) Biomodelling in Palaeontology: A Technical Note, Rapid Prototyping Jour., 2000, Vol. 6, No. 3, pp. 212-215.
- Johns Hopkins Digital Hammurabi (<http://www.jhu.edu/digitalhammurabi/>)
- Zhang et al., Reconstruction of the Homunculus Skull using a Combined Scanning and Stereolithography Process, Rapid Prototyping Journal, 2000, Vol. 6, No. 4, pp. 267-275.