

3-D Education: Biological
Anthropology Explored
Virtually

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Overview

- Project Introduction
 - The Technology
- Estimating Sex on the Cranium
- Estimating Human Biological Variation on the Cranium
 - Uses/ Conclusions

Project Introduction

- Why?
 - May not have access to specimens
- Gives access to specimens outside of lab hours
 - Allows for distance education

Project Introduction

- Exploring inexpensive 3-D technology
- Assessing accuracy in scans of estimating sex and population ancestry among modern humans
- Ability to implement this technology in courses, such as Introduction to Biological Anthropology labs

The Technology

- DAVID Laserscanner software



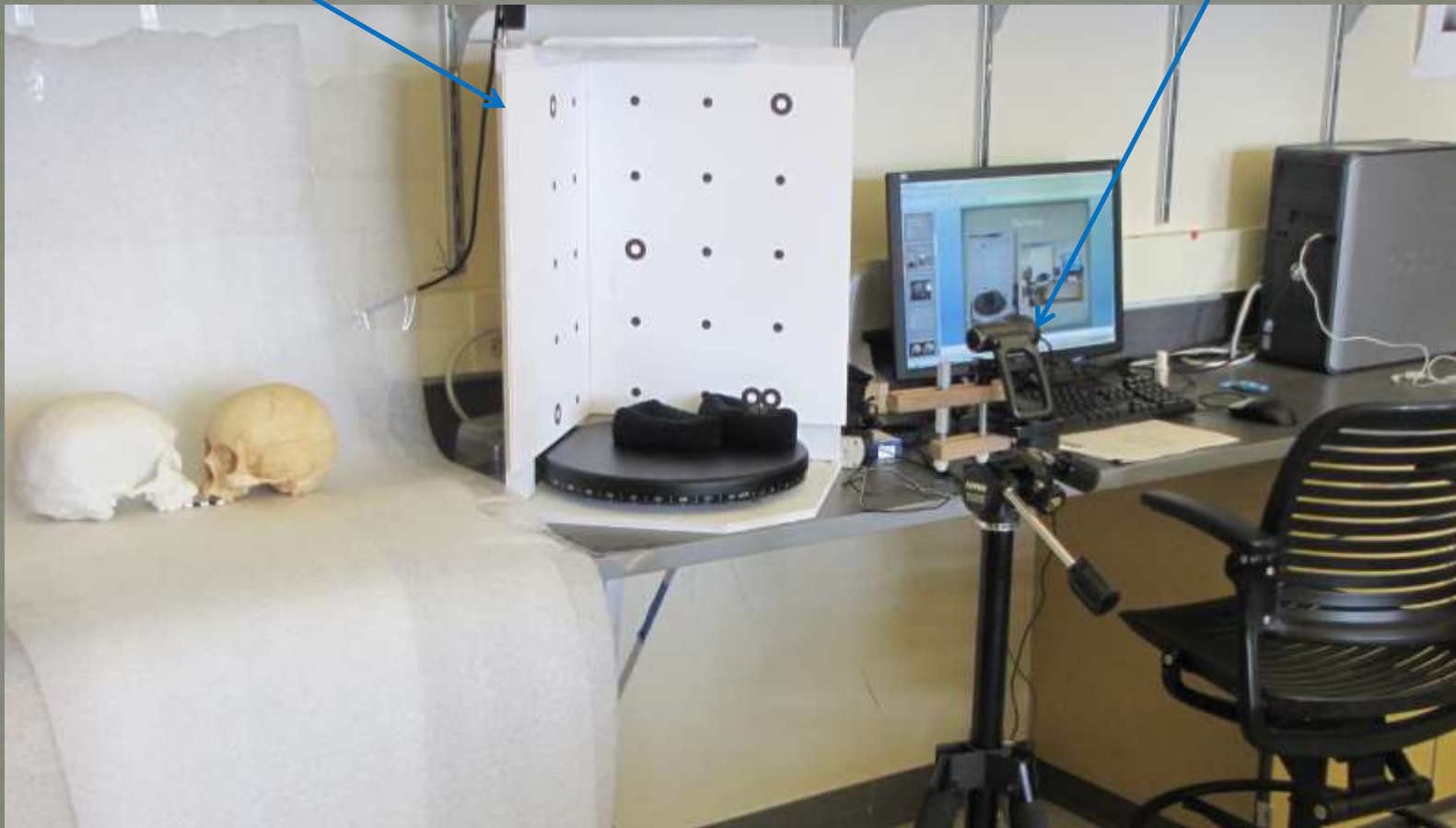
<http://www.david-laserscanner.com/>

- Webcam- high resolution recommended
 - Line laser
 - Calibration panels
 - 90 degree angle

The Setup

Scanning Angle

Webcam



Scanning



Sexing the Cranium

- Overall Size
- Mastoid Process
- Brow Ridge
- Nuchal Crest

Overall Size 3-D



European Male



European Female

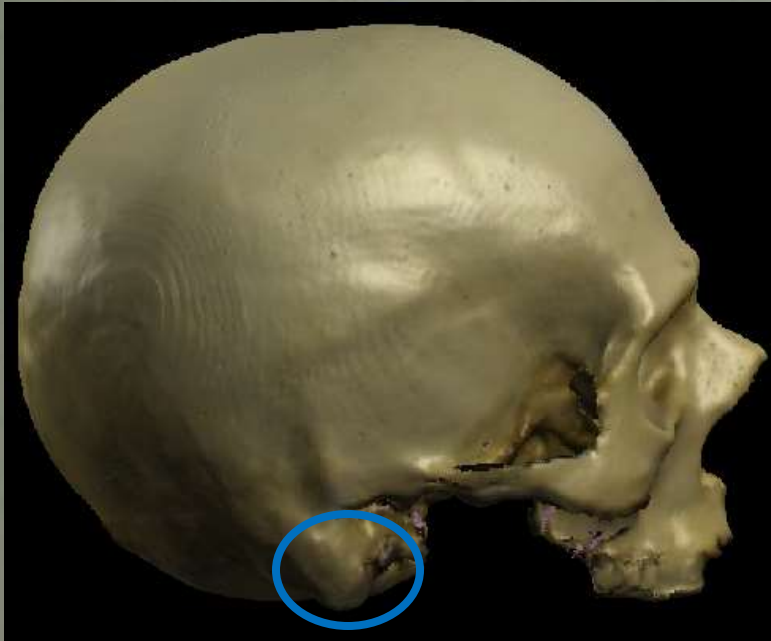
Overall Size 2-D



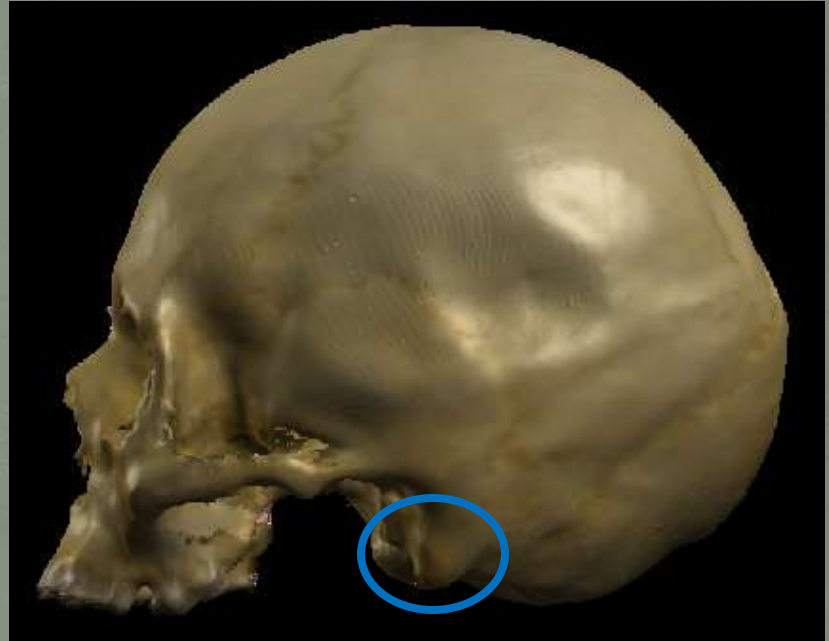
European Male

European Female

Mastoid Process

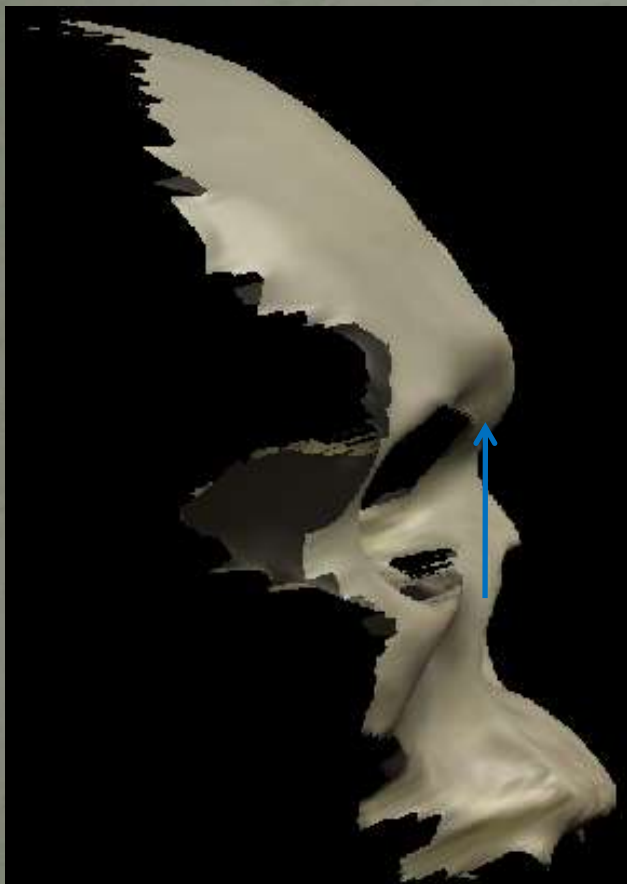


European Male



European Female

Brow Ridge 3-D



African Male



African Female

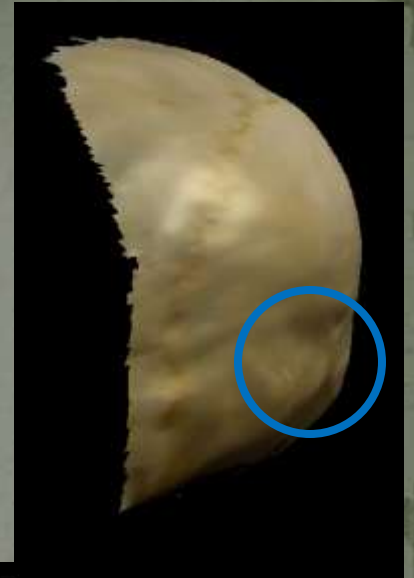
Brow Ridge 2-D



African Male

African Female

Nuchal Crest 3-D



European Male



European Female

Nuchal Crest 2-D



European Male

European Female

Assessing Human Biological Variation

- Nasal Form
- Alveolar Prognathism
- Mastoid Process

Nasal Form



African Male

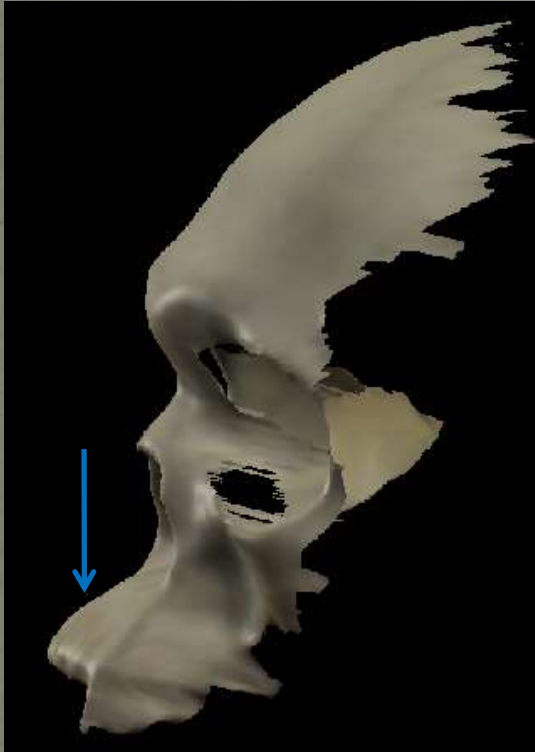


American Indian Male

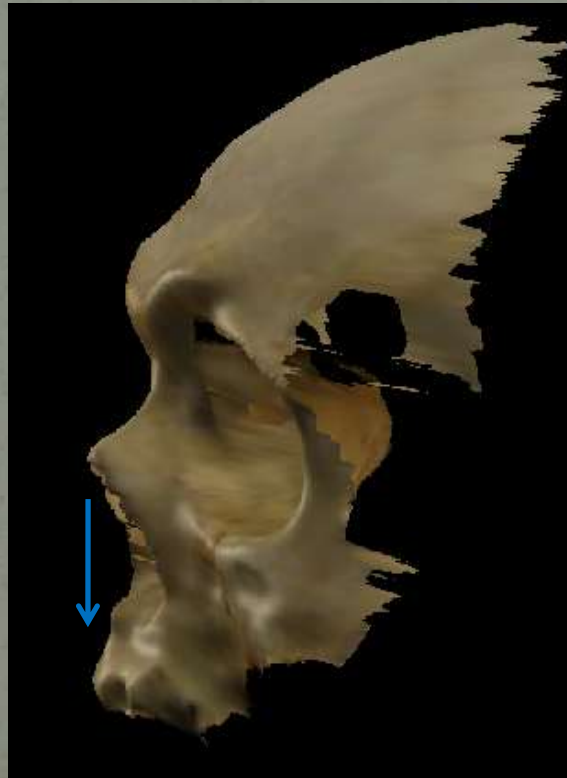


European Male

Alveolar Prognathism



African Male



American Indian Male



European Male

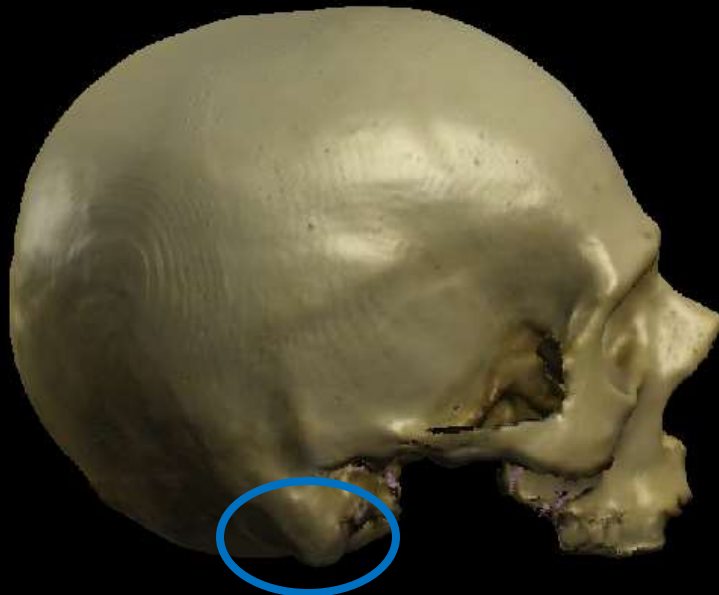
Mastoid Process



African
American
Male



American
Indian Male



European Male

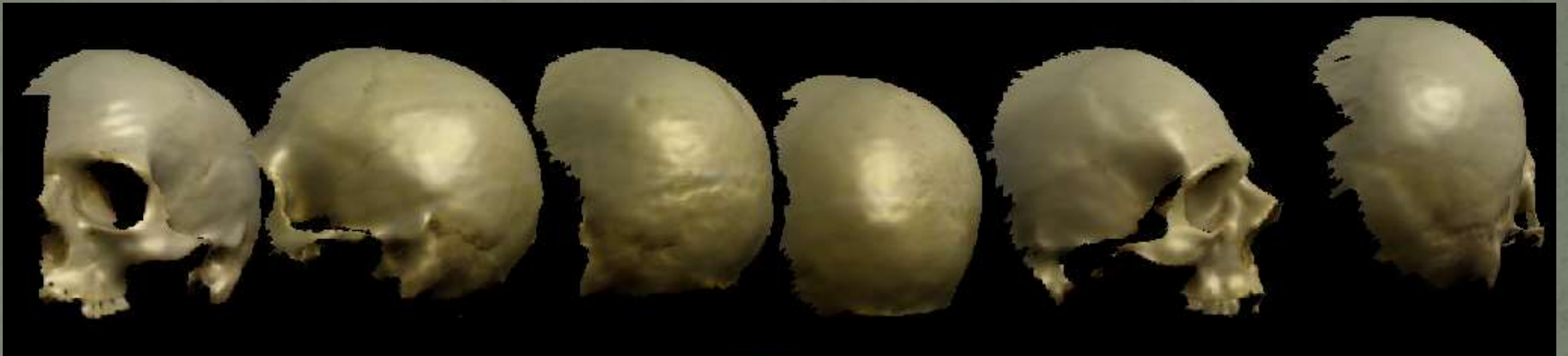
Uses/ Conclusions

- The 3-D technology works well for identifying sex and general population on human crania anthroposcopically
- Using the Landmark program, cranial sutures are not seen so extensive knowledge of the cranium is essential

Education

- Implementing this type of technology would be beneficial to Biological Anthropology labs
 - Access to specimens outside of lab hours
- The ability to have outreach courses where specimens would be available virtually for examination
 - Being able to use and see crania that is no longer available in University collections

Education



More Impressive Technology

- 3-D Cranial and Dental Imaging Center
Fort Collins, Colorado fieldtrip
- This technology is considerably more expensive, but
requires less time



Photos courtesy of Mafe Boza

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References

- William Bass
- George Gill

Questions?

