

# 3D Recreation of Australopithecus afarensis

Brenden Bannon / bbannon@asu.edu

Collins & Zokaites / 3D Tools - ART 218 / Digital Culture / Fall 2013

## Abstract

A NextEngine scanner was used to scan fossil casts of the Australopithecus afarensis skull fossil cast. This data was then brought into Maya and Zbrush where a reconstruction of the muscles and flesh was sculpted. The result was printed from a ZCorp 3D printer. Future research will focus on scanning the rest of the body and printing out the resulting recreation as well as using the model for animation.

## Research Question

What did Australopithecus afarensis look like? We have fossils of the bones, but we don't have the muscle or skin to see what they look like.

## Precedents and Prior Research

Recent work conducted like this was done by Cicero Moraes with Antrocom and Arc-Team. The Museum of Anthropology of the University of Padua provided the casts for the researchers to do a 3D survey using the techniques Structure From Motion and Image-Based Modeling. Moraes modeled the muscles in Blender using reference from DICOM scans of primates using InVesalius (ATOR). I was also influenced by the beautiful works of John Gurche, Zdeněk Burian, and Jay H. Matternes.

## Process

The NextEngine scanner was used to scan the Afarensis skull composite reconstruction by William Kimbel of the Institute of Human Origins (IHO). Two scans were taken of the skull and the mandible, and merged together in Geomagic.

The models were then brought into Maya where a base mesh of the musculature was built, then sculpted in Zbrush. The model was then printed from a Zcorp 3d printer.

## Results

After learning all of the potential pitfalls of trying to make a 3d print and what to look for in my 3d model, I was able to successfully print the model.

## Conclusion

The resulting model is nearly life sized and presents a fleshed out look at what Afarensis may have looked like.

## References

ATOR. "Arc-Team and Antrocom NPO start "Taung" project ." 24 Oct 2012. <http://arc-team-open-research.blogspot.com>. Web. 13 Oct 2013.

## Acknowledgements

I would like to thank the Institute of Human Origins and specifically Professors Julie Russ, Sarah Marsteller, Kaye Reed, Lindsay Mullen, and Ellis Locke for access to the Afarensis fossil casts. I also owe a huge debt of gratitude to Professor Daniel Collins for his help in coordinating this with the IHO, and his continual guidance in using the 3D scanning and printing equipment.



**Australopithecus afarensis** was a human ancestor that lived in East Africa (Ethiopia, Kenya, Tanzania) between 3.85 and 2.95 million years ago.