The University of Texas High-Resolution X-ray CT Facility and DigiMorph.org: Past, Present, Future

Jessica Maisano

Jackson School of Geosciences

The University of Texas at Austin

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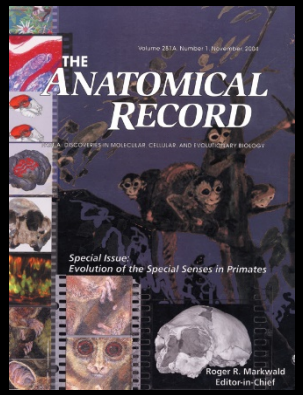

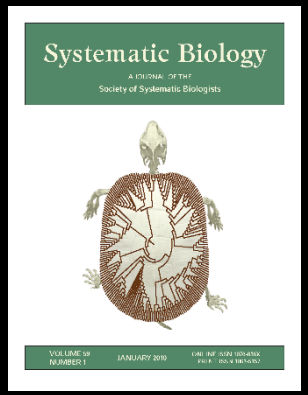

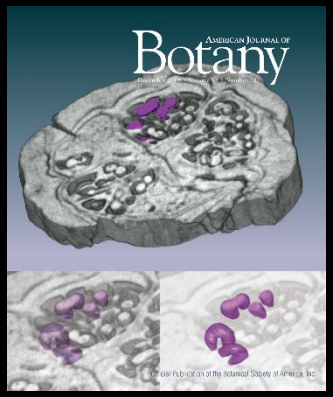

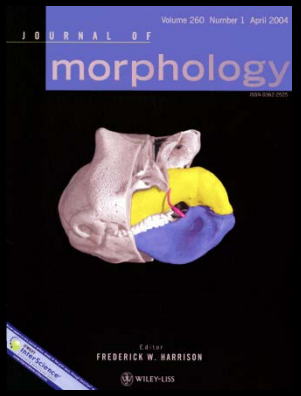

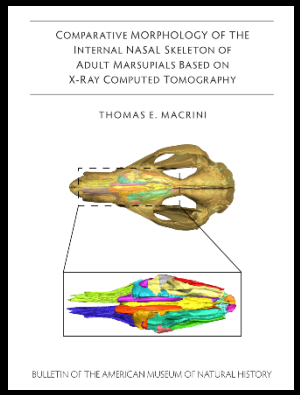

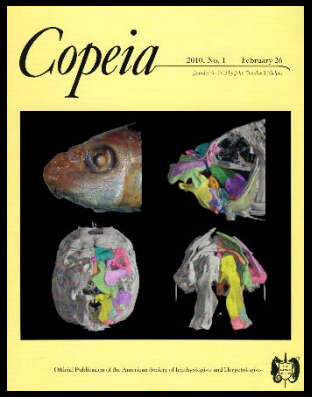

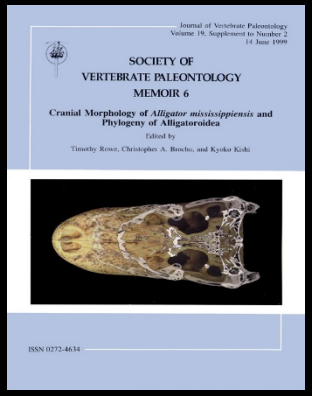

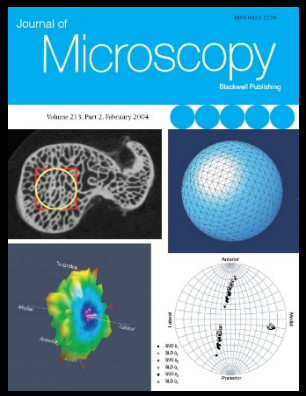

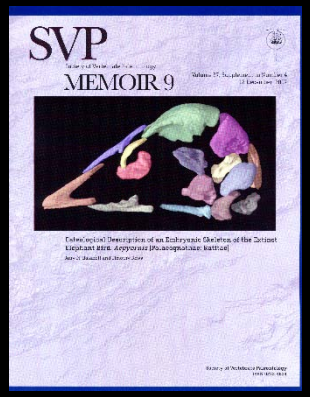

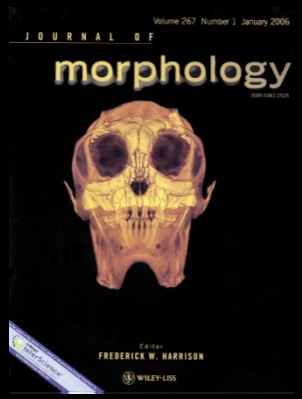

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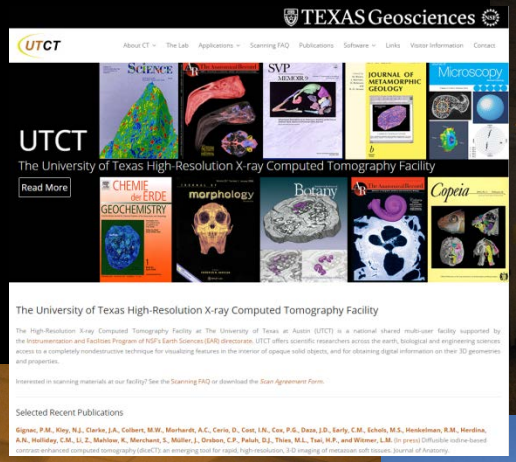
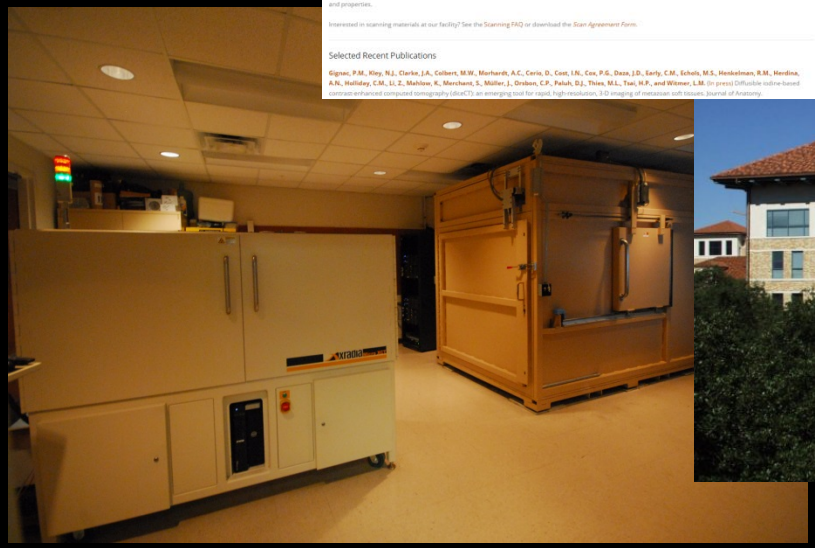
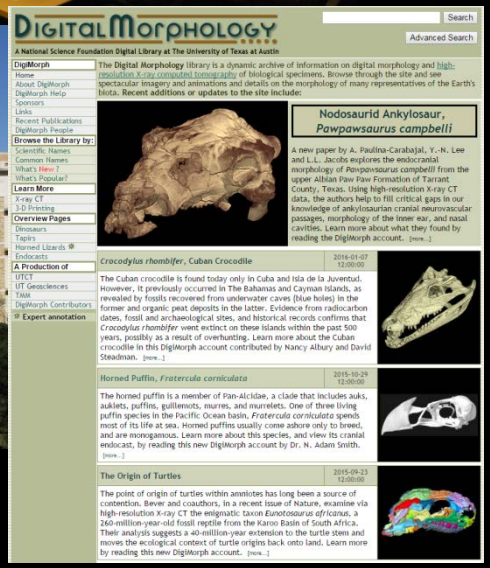
Almost 20 years!







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Reasons to CT scan biological and paleontological specimens:

- Nondestructive
- Minimizes specimen handling
- Digital preparation/skeletonization
- Rapid prototyping
- Visually compelling
- Increase access to specimens via WWW

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DIGITAL MORPHOLOGY

A National Science Foundation Digital Library at The University of Texas at Austin

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✳ Expert annotation

The **Digital Morphology** library is a dynamic archive of information on digital morphology and high-resolution X-ray computed tomography of biological specimens. Browse through the site and see spectacular imagery and animations and details on the morphology of many representatives of the Earth's biota. **Recent additions or updates to the site include:**

Spathorhynchus fossorium, Fossil Amphisbaenian

Amphisbaenians are enigmatic, limbless, fossorial squamates whose phylogenetic relationships are poorly understood. A new paper by Müller and coauthors in the Journal of Anatomy examines in detail the cranial osteology of *Spathorhynchus fossorium*, the oldest-known well-preserved amphisbaenian, from the Eocene Green River Formation of Wyoming. This study suggests that some 'primitive' characters may in fact be synapomorphies of an extinct Paleogene amphisbaenian clade. [more...]

Nodosaurid Ankylosaur, *Pawpawsaurus campbelli*

2016-03-23 12:00:00

A new paper by A. Paulina-Carabajal, Y.-N. Lee and L.L. Jacobs explores the endocranial morphology of *Pawpawsaurus campbelli* from the upper Albian Paw Paw Formation of Tarrant County, Texas. Using high-resolution X-ray CT data, the authors help to fill critical gaps in our knowledge of ankylosaurian cranial neurovascular passages, morphology of the inner ear, and nasal cavities. Learn more about what they found by reading the DigiMorph account. [more...]

Crocodylus rhombifer, Cuban Crocodile

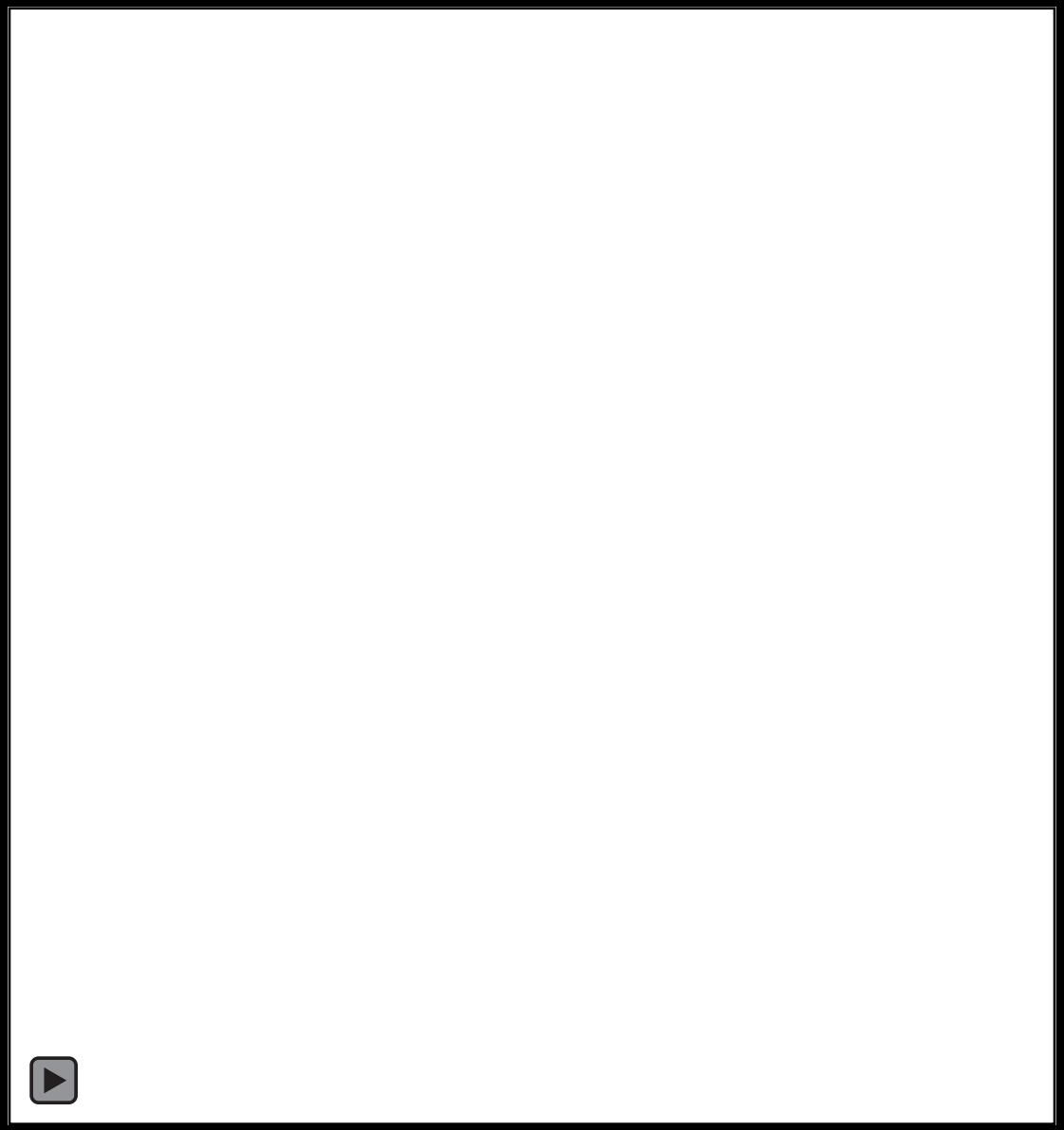
2016-01-07 12:00:00

The Cuban crocodile is found today only in Cuba and Isla de la Juventud. However, it previously occurred in The Bahamas and Cayman Islands, as revealed by fossils recovered from underwater caves (blue holes) in the former and organic peat deposits in the latter. Evidence from radiocarbon dates, fossil and archaeological sites, and historical records confirms that *Crocodylus rhombifer* went extinct on these islands within the past 500 years, possibly as a result of overhunting. Learn more about the Cuban crocodile in this DigiMorph account contributed by Nancy Albury and David Steadman. [more...]

Horned Puffin, *Fratercula corniculata*

2015-10-29 12:00:00

The horned puffin is a member of Pan-Alcidae, a clade that includes auks, auklets, puffins, guillemots, murres, and murrelets. One of three living



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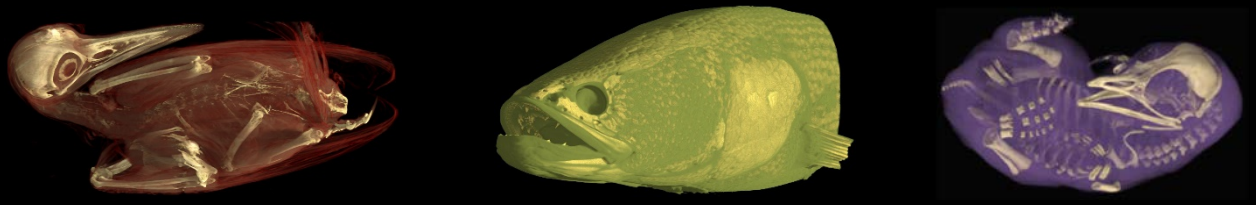
DigiMorph specimen selection:

- Common laboratory animals

- Species ‘in the news’



- Species that are particularly rare and/or sexy

Opportunistic DigiMorph specimens:

- Deep Scaly: 130 lizards & snakes
- AmphibiaTree: 27 amphibian species
- All Catfish Species Inventory: 21 catfish
- Rossie dissertation: 50 primates
- Van Valkenburgh: 50+ carnivorans
- Simmons: 22 bats

Reasons to Make HRXCT Data Freely Available:

- Enables data repurposing

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- McCurry et al., 2015, PeerJ
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- Fortuny et al., 2016, Nature Scientific Reports

Reasons to Make HRXCT Data Freely Available:

- Enables data repurposing
- Critical for peer review

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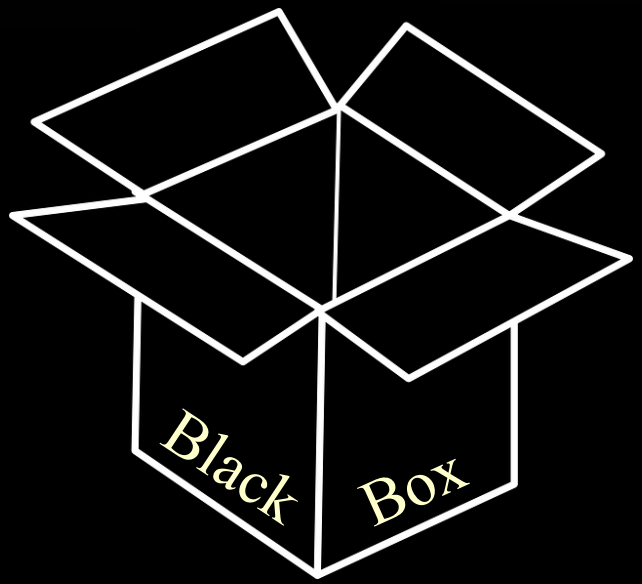

Reasons to Make HRXCT Data Freely Available:

- Enables data repurposing
- Critical for peer review
- Prevent data extinction

How to make HRXCT Data Available:

- Journals (Supplementary Information)
- Nature Scientific Data
- figshare, Dryad
- MorphoSource.org
- DigiMorph.org

In Conclusion:

- HRXCT scanning is valuable technology for biological and paleontological specimens
- HRXCT data should be made publicly available when publishing
- Nature Scientific Data, figshare, Dryad, MorphoSource, DigiMorph, etc.

Acknowledgments:

- U.S. National Science Foundation

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IIS-9874781, 0208675; EF-0334961)

- iDigBio

Save the Date

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June 6-8, 2017

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