



OZBONEVIZ



AUSTRALIAN RESEARCH COUNCIL
Centre of Excellence for Australian
Biodiversity and Heritage

A virtual 3D skeletal database of Australian fauna

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OUR TEAM



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Ozboneviz is an ARC Centre of Excellence for Biodiversity and Heritage (CABAH) funded project working in collaboration with multiple university and state museum collections in Australia and the United States. Led by Dr. Vera Weisbecker at Flinders University, the project aims to elevate our capacity to interpret vertebrate skeletal remains from late Quaternary fossil and subfossil deposits in Australasia by providing a high quality, online, centralised **digital reference collection**.

Vertebrate skeletal remains lie at the core of zooarchaeological, palaeontological and zoological research. Access to well-curated, comparative reference collections is therefore crucial for researchers working in these fields. The quality and comprehensiveness of individual collections is currently inconsistent, with relevant specimens often held across multiple private and public museum collections. Access to specimens is therefore variable and often involves costly travel, resulting in inequalities between researchers who have varying financial means.

Open access digital imagery can provide a democratic solution to these inequalities and recent advances in imaging technologies have made high quality, 3D image acquisition fast and relatively inexpensive. By providing high quality digital models of Australasian mammalian fauna Ozboneviz aims to support palaeozoological research and training in Australia.



Eastern Quoll (*Dasyurus viverrinus*) cranium (SAM-M7222)

2022 DIGITISATION PROGRAM



Dugong (*Dugong dugon*) cranium (UQ257)



The project aims to digitise skeletal elements from **~100 Australian mammals**. Skeletal elements being digitised include the skull, pelvis and all major forelimb and hindlimb bones.

The 3D models are hosted on the online platform MorphoSource, an open access database that connects 3D imagery with detailed metadata on specimen taxonomy and provenance. Digital specimens on MorphoSource are linked to museum database aggregators such as iDigBio which are regularly updated.

To date the project has digitised 50 species with many more on the way!

Check out the specimens currently available to download for **FREE** from the Ozboneviz project on MorphoSource.org.



Spectacled hare-wallaby (*Lagorchestes conspicillatus*) femur (UQ278)



Numbat (*Myrmecobius fasciatus*) mandible (SAM-M3758)



Solutionix C500 Structured Light Surface Scanner at Archaeology Laboratories, the University of Queensland

IMAGING MODALITIES

Digital acquisition is achieved using three primary modalities - micro-computed tomography (μ CT), structured light surface scanning and photogrammetry.

Micro-computed tomography produces very high resolution models which include all internal anatomical structures and is used for digitising whole body wet specimens and very small specimens. Image stacks produced from μ CT scanning will be made freely available on MorphoSource for future segmentation of additional skeletal elements.

Surface scanning is a high through-put method of imaging small-medium specimens and creates high resolution models of the surface of a specimen.

Photogrammetry is ideal for imaging large specimens and where accurate surface colour is desired.



μ CT scanning for the Ozboneviz project is undertaken using the large volume CT system (Nikon XT H 225ST) at the Medical Device Research Institute, Flinders University, Tonsley

3D IMAGING OF BIODIVERSITY AND HERITAGE OBJECTS WORKSHOP

Part of the Ozboneviz program is to provide training to researchers on 3D data acquisition, data management and analysis. In September 2022 Flinders University hosted the first 3D Imaging of Biodiversity and Heritage Objects Workshop.

Over three days participants were given hands-on training in 3D model acquisition using the three imaging modalities used by the project. This included practice segmenting μ CT scans, using a range of structured light surface scanning technologies and creating photogrammetry models. Workshop participants were also introduced to the key concepts of 3D shape analysis (geometric morphometrics) with practical examples using the programming language R.

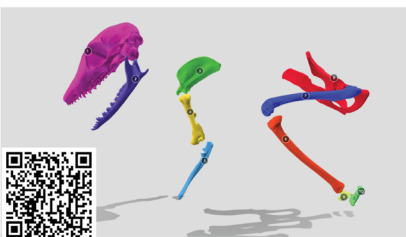
Additional workshops will be held in 2023.



3D imaging workshop held at Flinders University, Bedford Park, September 2022



COMING SOON IN 2023 OZBONEVIZ 2.0



VIEW ME!

Ozboneviz has recently received additional CABAH funding to develop online **educational resources** on Australasian mammalian skeletal morphology and evolution.

Stage Two will begin in 2023 and produce resources for a range of audiences including tertiary and secondary students and outreach educators. These public facing resources will be hosted on Sketchfab.com and will include annotated comparative information drawn from current research in palaeozoology and evolutionary biology.

Digital acquisition of specimens will also continue into 2023 with a focus on improving coverage of mammals from New Guinea.



VIEW ME!



Whole body μ CT scan of the extinct Lesser bilby (*Macrotis leucura*) (SAM-M3933)

Ozboneviz is a sister project to **Ozboneprot** (2022-2023) led by Prof. Sue O'Connor and Dr. Sofia Samper Carro (Australian National University) and **Fishboneviz** (2023) led by Dr. Ariana Lambrides (James Cook University)



If you have 3D data you would like to include on the Ozboneviz database, or an education use case talk to us!

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