

## **Talk: Supporting and strengthening 3D morphometric data pipelines from production to analysis with MorphoSource digital repository infrastructure**

*Speakers:* Julie M. Winchester, Doug M. Boyer, MorphoSource/Duke University

### *Abstract:*

Digital morphometrics research requires large samples of data that are adequately curated, contextualized, and accessible in order to address potentially transformative questions pertaining to organismal phenotypes. This necessitates the production and curation of large quantities of data, which must be placed in a digital infrastructure that allows for proper curation, as well as the ability to access similarly large quantities of data, both produced by the original research team and by other researchers. MorphoSource, as a research-focused digital repository supporting 3D media representing physical objects, directly supports this data-production-to-analysis pipeline. This talk will address current and future MorphoSource features that can be leveraged for “large data” morphometrics research. Current features include the repository’s discipline-specific data model that allows for straightforward contextualization of data, batch data submission, and a metadata query REST API, among others. Future features that will be discussed include remote-backed datasets, enhanced file upload/download API tools, preserving and sharing 3D annotations with support for annotation ontologies, and connecting repository data to large-scale queries and analysis.

### *Bio:*

Julie is the Technical Director for the MorphoSource 3D Data Repository in the Department of Evolutionary Anthropology at Duke University. Her research background is in bioinformatics, specifically creating and applying algorithms to quantify 3D shape from anatomical surfaces to elucidate form-function relationships between anatomy and behavior. Julie has published widely, applying these algorithms to study dietary ecology of living and fossil primates, and has created many software tools implementing these algorithms. Her current professional focus is on combining software engineering and academic research experience to improve and expand digital cyberinfrastructure for archiving and making accessible scholarly data of scientific or cultural value, especially 3D data, which tends to require a particularly high degree of care and specificity in its curation. In 2016, Julie began working with [MorphoSource](#), the largest digital repository for academic 3D data representing physical objects, both scientific samples and cultural heritage objects. In her role as Technical Director, Julie leverages an understanding of academic use cases and perspectives to design solutions that help MorphoSource better serve its diverse user community. She leads a team of three developers in architecting and implementing these solutions. In early 2021, the MorphoSource team launched a complete rebuild of the repository platform, significantly expanding both the functionality and usability of the site, including features like deeper support for cultural heritage and photogrammetry data, and the ability to interactively preview and measure color/textured 3D meshes and CT/MRI volumetric images, among many others.