

## Digital Fossils at the Alf

Written by Andrew Farke

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Paleontology is a global science, with researchers all over the world striving to understand more. With over 150,000 fossil specimens, many of them representing extinct species found nowhere else, the Alf Museum is a critical resource. However, not every researcher who wants to study our specimens can get to the museum. Thanks to the expansion of digital scanning and archiving, Alf Museum specimens are more accessible than ever before.

Digital photographs of fossils are useful, but a three-dimensional representation is best. This allows the viewer to examine structures from different angles, zoom in and out, and take measurements in any direction. Affordable 3D printing technology means that a scientist can download a digital file of a fossil and create a plastic replica within hours. Museums have been discussing specimen digitization for years, but few have acted, largely for technological or logistical reasons. With improvements in software and desktop computers, as well as the support of Webb students, the Alf Museum is poised to take the lead in the digitization of paleontology collections.

Photogrammetry is the technique used to digitize the museum's most important specimens. Here, a fossil is photographed from multiple angles with a digital camera and then the pictures are loaded into software that reconstructs the fossil's shape. The result is a file representing a three-dimensional specimen that can be uploaded to a free-access website and then downloaded by anyone in the world.

Beyond the "gee-whiz" factor, digitizing collections serves several important roles. As mentioned above, it improves access to collections for researchers (and the public) worldwide. New kinds of research are also possible, as digital specimens can be used for sophisticated measurements and analyses, allowing better documentation and interpretation of the fossil record. Finally, digitization helps the Alf Museum to fulfill its mission of preserving and protecting rare fossil resources. Digital files serve as a "back-up" if a specimen is damaged or lost.

Digitization efforts also fit our educational mission. Webb students Tristan Duque '14 and Stephanie Rapoport '14 are digitizing specimens in their advanced research class. Thus far, they have focused on digitizing the museum's ichnotypes (specimens designated as the original reference for a new kind of fossil track). For instance, our fossil spider tracks from the Coconino

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Sandstone near Seligman, Arizona, were designated as the ichnotype of *Octopodichnus raymondi*. Thus,

ichnotypes have great scientific interest for paleontologists. An initial sample of digitized specimens from our collection [

[viewable here](#)

] was posted to the international research archive

[figshare.com](http://figshare.com)

in September and has already been viewed by hundreds of people worldwide. The Alf Museum is going global!

*This article originally appeared in the [Winter 2013 edition](#) of the museum newsletter, Quest.*