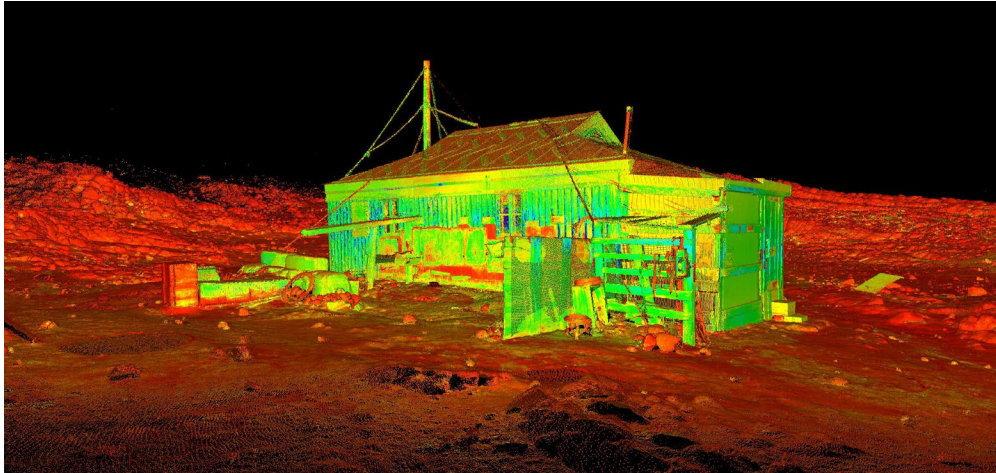


digital heritage



This point cloud image represents extremely dense data of 1-2mm point spacing resolution. The structure is one of Shackleton's huts on Ross Island, Antarctica, a remnant of the early expeditions to Antarctica by competing explorers Shackleton and Scott. This data was captured and donated to the CyArk archive by our Data Donation Partner, Geometria of New Zealand.

Data Density for Cultural Heritage

In October, the non-profit CyArk launched its “500 Challenge”, a global initiative to use LiDAR and other advanced 3D imaging technologies to digitally preserve 500 cultural heritage sites within the next five years. This initiative is driven by the need to document our collective built human history before it is lost permanently to climate change, war, terrorism, arson, urban sprawl, natural disasters, and other threats. As part of our Challenge to the world and our global network of partners, we are making a call for donated data from service providers who have previously documented cultural heritage sites with reality capture technologies. We have even established a Data Donation Partner Program to accompany this call for data.

As a commercial firm you might be wondering, “What type and/or quality of data?” This is the most common question we receive from partners conducting field work for us, or partners who wish to donate heritage data previously collected. Heritage sites can be drastically different from typical terrestrial LiDAR applications like forensics, AEC, and plant work because

heritage managers have very different needs from the data than typical commercial work. As an organization that has spent 10 years specializing in documentation of cultural heritage sites, we have refined our methods, and we have worked closely with heritage managers to understand their unique needs. I, myself, have an archaeology background as well as eight years of laser scanning experience, bridging the gap between scanning and heritage.

Therefore, I'd like to offer one key, basic guideline to service providers looking to partner with CyArk in either the data donation program or the execution of site documentation projects—or just for those who have been pondering branching out their services to include the heritage market. It is necessary to understand that site conservation is about the details. Conservators need to see the details. “Where is that small crack? Where are those broken, fractured bricks? Where is that centuries-old original fragment of painted plaster?” So, resolution is *key*! Consider that archaeologists spend vast amounts of time with plumb bobs and planning frames, drawing every stone, every artifact fragment, of their excavation or

site. Yes, LiDAR technology can map faster and remove human error inherent in these traditional methods, but mapping too quickly and compromising resolution can render the data useless to the researcher or conservator. For many commercial applications, basic geometry is all that is needed to produce the necessary models to predict clashes, find corners, measure sag, prefabricate replacement pipes, etc. In these applications, for example, every brick may not be needed as long as the wall plane is known. And this differs from the concerns of the heritage managers. Another great example for comparison might be a traditional HABS (Historic American Building Survey) drawing. HABS drawings are truly works of art with architectural furnishings “exploded” in complex axonometric views and lengthy descriptions where the architect may even verbosely describe the material's texture, feel and color. Conservators and historians need and want to see the details, and so high-density data (think sub-centimeter) is necessary for good heritage work. ■

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