ARCHAEOLOGICAL RESEARCH LAB CREATES DIGITAL 3D LIBRARY OF ARTIFACTS USING HDI ADVANCE 3D SCANNERS

Sustainable Archaeology Animation Unit (SAAU) leverages HDI scanners to create 3D digital archives of large archaeological collections.

Sustainable Archaeology, and its Sustainable Archaeology Animation Unit, (SAAU), have taken innovative steps to make Ontario's archaeological records accessible to researchers, students, and the public without ever having to step foot into a museum or storage facility.

ABOUT THE CLIENT

The University of Western Ontario's SAAU unit is the first ever animation studio dedicated to archaeology. Its mandate is to combine three-dimensional (3D) artifact digitization and computer generated imagery (CGI) to achieve long-term preservation and digital archiving of Ontario's archaeological heritage.

The Challenge

How To Accurately Scan Large Volumes of Small Artifacts

Due to the complex nature of their work, the SAAU was looking for an efficient solution to digitize these large archaeological collections. The challenge was to find a 3D scanning based workflow tailored to their unique lab processes; one able to scan large volumes of small archaeological artifacts with maximum speed and data accuracy. SAAU's ideal solution also needed to be able to scan artifacts in a wide range of different shapes and sizes, and capture the true likeness of objects with high-resolution color and texture.
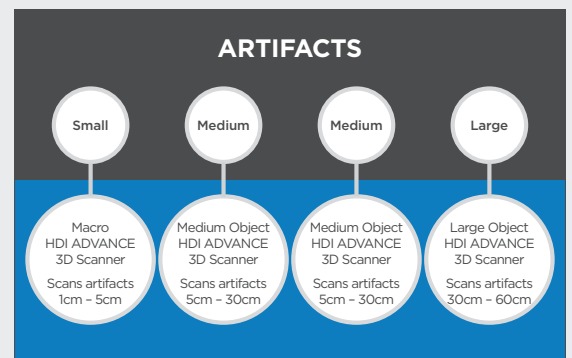

Digital artifact produced by the HDI Advance Scanner. Click on the YouTube icon for video of the 3D model in 360 degrees

The Solution

SAAU was outfitted with a system comprised of four customized HDI Advance 3D Scanners.

One Macro HDI Advance was implemented for detailed scanning of small objects ranging from 1cm to 5cm. Two HDI Advance 3D Scanners were set up as medium object scanners to scan artifacts ranging from 5 cm to 30 cm. The fourth HDI Scanner was used to scan artifacts ranging from 30 cm to 60 cm. These four HDI Scanners were configured to scan artifacts according to Sustainable Archaeology's specific needs.

When needs change, SAAU is able to easily reconfigure the scanners to meet new requirements without having to purchase a completely new system.

ARTIFACTS

Small	Medium	Medium	Large
Macro HDI ADVANCE 3D Scanner	Medium Object HDI ADVANCE 3D Scanner	Medium Object HDI ADVANCE 3D Scanner	Large Object HDI ADVANCE 3D Scanner
Scans artifacts 1cm – 5cm	Scans artifacts 5cm – 30cm	Scans artifacts 5cm – 30cm	Scans artifacts 30cm – 60cm

Due to the volume of artifacts that needs to be digitized, each scanner is geared towards scanning artifacts of a specific size to speed up the 3D scanning process.
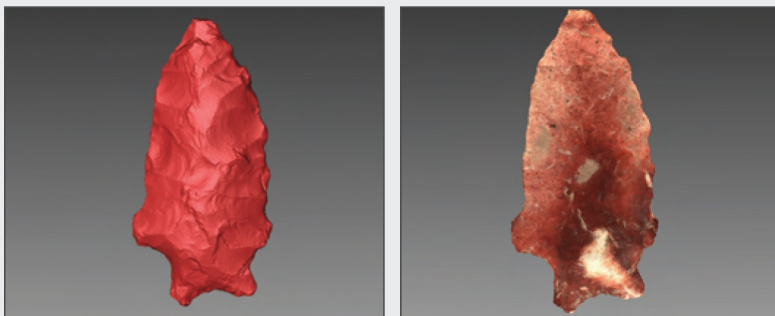
The Results

Capturing the True Likeness of Artifacts

As a result, SAAU is able to view each digitized artifact as a scalable model that can be rotated in 360 degrees, with resolution equal to the level of detail the artifact was manufactured with. All of that combined with the ability to add high-resolution color and texture to the 3D model, allows SAAU to generate truly life-like digital versions of the original artifacts.

Next Steps

The next step for Sustainable Archaeology and the SAAU is to continue to build its digital archive of artifacts housed in the repository. The organization's ultimate aim is to make these images, along with numerous other datasets that make up the record of archaeological fieldwork, available online for the thousands of sites that will be brought into the facility.

Making these records and images accessible will allow researchers, students, descendant groups and the public to access the first ever fully digitized record of the region's complete archaeological heritage. For more information about Sustainable Archaeology and the efforts of the SAAU, please visit **www.sustainablearchaeologyuwo.blogspot.ca** and **www.saanimation.wordpress.com.**

> *"We're very impressed by the results produced by the HDI Advance 3D scanning systems. From talking to other researchers and from our past experiences, we found that other 3D scanners normally take a couple of hours to scan one artifact. With the assembly line approach to 3D scanning we are able to scan an artifact in about 30 minutes, which cuts down a considerable amount of time for us.*
> *This is very important factor when there is a large collection of artifacts to scan."*
> *— Namir Ahmed SAAU, Project Co-ordinator*

The image below (left) is a 3D scan of a small projectile point approximately 5 cm in size that was scanned with the Macro HDI Advance 3D Scanner. The image (right) is the same point with original coloring and texture of the stone added to the 3D scan. The scanner captures the precise shape of the artifact in 3D in addition to the color and texture of the surfaces.

To learn more about HDI Advance 3D Scanners, please email
contact@lmi3d.com