



The Shaka Triad statue, the central figure of Horyu-ji Temple, was reproduced as a gilt bronze statue using a 3-D scanning, 3-D printing, and analog traditional artistic techniques, and we also reproduced the various items which original had lost such as the Horyu-ji Main Hall mural painting to create realistic sensations that help visitors to feel as though they are at the Horyu-ji Main Hall.

Clone Cultural Properties

Arts & Science LAB.
Tokyo University of the Arts

Arts & Science LAB, Tokyo University of the Arts

The Arts & Science LAB of Tokyo University of the Arts combines traditional analog technology with integrating craftsmanship and sensibility, with state-of-the-art digital technology to reproduce the world's cultural properties that have been stolen or lost. We produce "Clone Cultural Properties" that represent the original artworks with great accuracy by using the original types of materials and reproducing the original textures.

traditional
analog
technology

state-of-the-art
digital
technology

Clone Cultural Properties

The Advantages of Clone Cultural Properties



Materials

The base materials used for the drawings vary and include canvases, traditional Japanese paper, clay walls, and rocks. Clone Cultural Properties reproduce originals to the greatest extent possible, and they reproduce not only what is

visible on the surface, but also the foundations hidden beneath the surface. These cloned properties are so meticulous that they can be touched as well as viewed, and they have rich textures.

Innovative Advanced Technology

Along with the technology evolution, we actively adopt the state-of-the-art digital technologies in a timely manner, such as high-resolution imaging equipment and 3-D scanning and printing devices to

assure continuous improvement of the quality and production methods. The technology also contribute to the progression of future research by the acquisition of precise data from originals.



Aesthetics

The high quality of the Clone Cultural Properties is maintained by understanding the intention of the original artworks which can not be supplemented by science in addition to

Tokyo University of the Arts staff's specialized traditional analog techniques and their aesthetics as artists.



Spatial Reproduction

People get a feeling of space by stimulating the entire five senses. We reproduce the entire spaces in which the

original were displayed to create realistic sensations that help visitors to feel as though they are at the original sites.

Combine Preservation and Display to the Public

We are facing into a dilemma in that while cultural properties must be safeguarded for preservation there is also the need to display artwork to the public. To resolve this problem, Tokyo University of the Arts has developed "Clone Cultural Properties" which creates extremely accurate reproductions of cultural properties with combining analog traditional technology and latest digital technology. We meticulously study the originals using state-of-the-art digital technology and traditional analog

technology to faithfully represent the originals' paints, base materials, surface dimples, and brushstrokes. Clone Cultural Properties are reproduced the artistic DNA comprising the techniques, cultural backgrounds, and spirituality of the originals through artisanship and sensitivity. This technology helps to preserve and transmit cultural properties that are global public assets, aiming to promote the realization of broad cultural sharing and world peace.



G7 Ise-Shima summit

On May 26, 2016, the G7 Ise-Shima summit hosted a side event, titled "Terrorism and Cultural Property—Counter message against destruction and illicit trade of cultural property by terrorists." The cloned mural of the Eastern Buddha niche in Bamiyan, which had been destroyed, was displayed there as well as a clone of the No. 6 wall of the Horyu-ji Main Hall, which also was destroyed by fire. We explained Clone Cultural Properties to the G7 participants, from whom the idea that cultural assets destroyed by terrorism or war could be restored as many times as needed with Clone Cultural Properties was transmitted around the world.

Myanmar's Bagan ruins

A Clone Cultural Property of the mural painting of Myanmar's Bagan ruins (one of the three greatest Buddhist relics in the world) was presented as a souvenir to the state leaders of the ASEAN Plus Three nations by the Myanmar government at an ASEAN summit held in Myanmar in November of 2014. Also the clone has been on display as part of the public collection at the National Museum of Myanmar in Naypyidaw, the capital. We will work with Myanmar's government to help the nation nurture its tourism industry and recover from its recent disaster.



the East Great Buddha Niche of Bamiyan

We reproduced same sized mural of the Sun God on the Golden Chariot, painted on the ceiling of the Eastern Buddha niche in Bamiyan, Afghanistan, which was destroyed in 2001. The clone was based on photographs taken by Kyoto University's Institute for Research in Humanities and 3-D data taken by Germany's RWTH Aachen University. It was displayed together with 4-K

images of the four seasons of the Bamiyan Valley from the top of the Colossal Buddha to demonstrate to create realistic sensations that help visitors to feel as though they are at the original sites. This display shows that the Clone Cultural Properties' technology allows us to share various cultural assets across borders, even when the originals have been destroyed or lost.

Making of The Clone Cultural Properties

1. Research

Conducting on-site analog research on colors and textures, such as color matching, based on the artists' aesthetics.



2. Analysis

Conducting on-site digital research, including high-definition photographs and scientific surveys such as X-ray analysis.



3. Image processing

Match the color using computers with the consideration of the analog research and digital research.



4. Base creation

With analyzing the dimples on the surfaces of brushstrokes, we reproduce the textures manually with the structural outlines and cracks which can not be supplemented by digital equipment.



5. Digital Printing

The high-definition data is printed by our proprietary printer which dedicated for high speed printing.



6. Surface Finishing

Reproduce the dimples of the original artwork using 3-D measurements, and, coloring manually.

