Japanese Scan Copán's Acropolis to Bring It to the Virtual World

Engineers and archaeologists from Japan will bring Copán to Virtual Reality (VR) and Mixed Reality (MR) to allow anyone in the world to explore it from an immersive perspective.

The company Elysium and Komatsu University, both entities from Japan, are scanning the Maya Acropolis of Copán using LiDAR technology (Light Detection and Ranging) to bring this World Heritage site to Virtual Reality and Mixed Reality.

A team of four engineers from Elysium, including Daisuke Nakagawa, General Manager of InfiPoint software, are capturing 3D images with LiDAR technology, which will later be integrated into an immersive environment to allow anyone in the world to explore it.

These engineers are working alongside Yoichi Sato, coordinator of the Komatsu University team in Honduras; Seiichi Nakamura, Director of the Center for Next-Generation Archaeological Studies; and Masahiro Ogawa, Assistant Professor at the institution, as well as an archaeologist in charge of the 3D LiDAR scanning.

Archaeologist Seiichi Nakamura informed Diario La Prensa that 'Komatsu University of Japan, along with the Honduran Institute of Anthropology and History (IHAH), is conducting the complete 3D digitization of the Copán Archaeological Park using the key research funding granted by Komatsu University and a contribution from the Japanese company Elysium, which is one of the most recognized companies worldwide in the field of 3D data management.'

'Through this project, we aim to take the 3D digital data and create the 3D model of the UNESCO World Heritage Sitio Maya de Copán, with the goal of using those data and the 3D model to create Virtual Reality, Mixed Reality, etc., to promote the Maya Site of Copán at the Osaka-Kansai World Expo in Japan, which will take place this year in 2025,' Nakamura said.

At this exhibition, which will begin on April 13 and conclude on October 13, 150 countries and 25 international organizations will participate. Honduras confirmed its attendance at this event in 2022, according to the Japanese government, as stated on their website.

Virtual Reality (VR) is a technology that allows users to immerse themselves in a completely computer-generated digital environment. To experience it, people use devices such as VR headsets, haptic gloves, and controllers that allow interaction with the virtual environment.

In this experience, the physical world disappears entirely, and the user is transported to an artificial 3D space where they can move and manipulate objects as if they were truly there.

Augmented Reality (AR), on the other hand, does not replace the real world but complements it by overlaying digital elements onto the physical reality. This is achieved through devices such as smartphones, tablets, or AR glasses, which display graphics, information, or animations on the screen while the user still sees their real surroundings. A popular example of augmented reality is the game Pokémon GO, where players can see virtual creatures through their phone’s camera.

Meanwhile, Mixed Reality (MR) combines elements of both Virtual Reality and Augmented Reality to create more advanced interactive experiences.

In Mixed Reality, digital objects not only overlap the real world but can also interact with it in real time. This means that virtual elements can respond to the user's movements or to the characteristics of the physical environment.

“Currently, thanks to Japan's non-repayable financial cooperation, there is a special exhibition at the Regional Archaeology Museum in Copán Ruinas, where tourists can tour the network of tunnels that are not open to the public. However, there is not yet a virtual tour of the Copán Archaeological Park. IHAH and Komatsu University aim to create a Virtual Reality version of the Copán Archaeological Park in which tourists can roam freely inside, climb the temples, and observe from different angles, including from above (the sky), like birds,” he explained.

Innovative Technologies to Promote the Maya Site

Nakamura, a prominent archaeologist in the Maya world, stated that with "Mixed Reality technology, they aim, for example, to allow visitors to see the buried structures within a temple and/or the tomb found and its excavation findings through their phone or tablet. They would simply scan the QR code placed at the site and view these temples through their devices."

"All these innovative technologies will help promote the Sitio Maya de Copán for tourism, both for locals and foreigners, and will be made possible with the voluntary support of the Japanese company Elysium. Currently, Elysium, along with Sony, is working on creating a flat monitor to view the 3D image on that monitor without needing to wear the special glasses typically used in museums," he said.

This is not the first time that experts have used LiDAR technology for archaeological research. In 2015, international researchers discovered a large pre-Columbian city abandoned around the year 1500 AD in the Mosquitia region of Honduras.

The archaeologists, led by specialists from Colorado State University, USA, named this site "The Lost City of the Monkey God."

LiDAR technology (Light Detection and Ranging) is a detection and measurement system based on emitting laser pulses to calculate distances with high precision.

It works by sending thousands of light pulses per second and measuring the time it takes for them to return after reflecting off objects. From this data, a detailed three-dimensional map of the environment is generated.