Application

MONGOLIAN MONOLITHS

Task

- Digitization of Mongolian monoliths,
  upright stones carved with mysterious symbols (Deer Stones)

Measurement sensor tri *TOS*-HE color

Object

- The different monoliths vary in their dimension, they could have a height of several metres
- It is likely that Bronze Age nomads erected these stones throughout the northern region of Mongolia and southern Siberia around 1000 B.C.

Measurement System

- tri *TOS*-HE-675 color (TT680-HE-L600-675)
- Measurement Field: 675 mm (image diagonal)
- Feature Accuracy: ± 60 µm
- OPTOCAT Version 4.01.29


Portable measurement system

Principle of Measurement

- Topometry; image processing metrologies, based on fringe projection techniques (GrayCode- and Phaseshift-Method)
- Contour-Matching, combining a set of measurements by the object geometry


3000 years old monoliths in the northern region of Mongolia


Transport vehicle

Specifications

- Non-contact measuring method
- The sensor system for the measurement acquisition of 3D data is fixed on a tripod and is rotated around the object in different positions manually
- Powered by auto battery and mobile power generator
- Scanning was done at night or within a tent

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History

- Since 2001 a multidisciplinary team from the Smithsonian Institution coordinated by archaeologist William Fitzhugh and biologist Paula DePriest, have been researching the history of Mongolia's mysterious monoliths known as deer stones.
- The stones vary in size and iconography, and exhibit anthropomorphic features or decoration that have been interpreted as memorialising important persons.
- In the summer of 2006 archaeological conservators Harriet Beaubien, Vicky Karas and Leslie Weber from the Smithsonian's Museum Conservation Institute (MCI) used the 3D scanning system to record extraordinary detailed information about these deer stones. This information will be used to monitor and preserve these monuments.

Monolith with iconography

Advantages

Traditionally, monuments like these are recorded by taking photographs or making free-hand line drawings. With the technique of 3D photography, a record of the stone's surface down to the tiniest detail is created. The digital data collected can be used for:

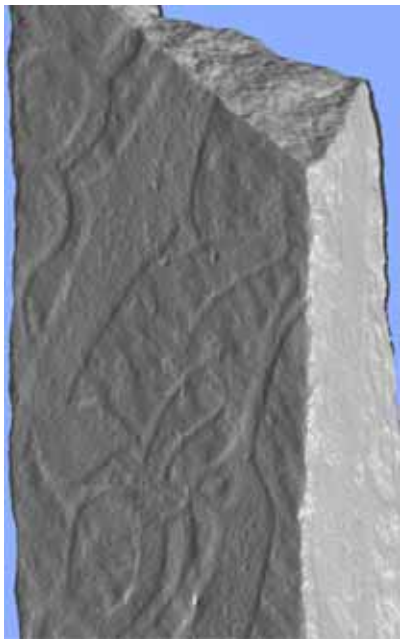
- Creating a precise archival record of metrological data
- Create faithful replicas for display and research
- Research and interpretation of the carvings

Measurement setup with a tent to avoid sunlight interference

For more information about the Smithsonian's Museum Conservation Institute and the Deer Stone Project visit: http://www.si.edu/mci/

Support for this project was also provided by Accurex Measurement see http://www.accurexmeasure.com

Complete digitised monolith



Detailed 3D information…

… as well as colour texture.

Contact

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