Architectural study and restitution of the Greco-Roman temple of Sobek and Harwer in Kom Ombo (Upper Egypt)

FNS Ambizione Project (2023-2027)

EPFL

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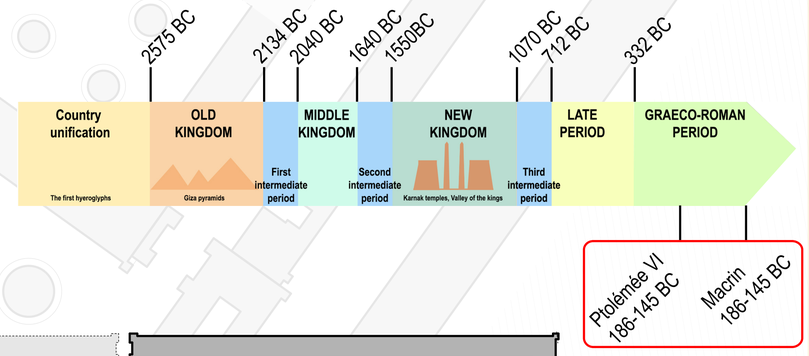
At the heart of important economic issues, the exploitation and modern use of archaeological sites often take precedence over their study. The temple of Kom Ombo, located along the Nile cruises journey, is one of the essential stops for thousands of tourists. It is therefore directly concerned by the problems of wear and tear, maintenance and conservation of structures that often go beyond the framework defined by the Venice Charter.
It is therefore urgent to proceed with the analysis of this category of buildings, in order to allow their scientific safeguarding.
Digital humanities are at the heart of current research in the humanities and offer new perspectives for the documentation and inventory of resources, but also in the development of methods and tools as well as for the dissemination and sharing of data.
The treatment of the data that will be collected, (re)used, generated and studied will, as much is possible, follow the principles of FAIR and CARE open science.

Project

The Kom Ombo Temple is located on the eastern bank of the Nile between Edfu and Aswan in Upper Egypt. The temple, dedicated to the gods Sobek and Harwer and their associated deities, is located on a plateau bordered by two arms of the Nile, which were responsible for the major collapse of the sanctuary buildings.
The temple appears to have been built in several phases from Ptolemy VI Philometor (186-145 BC) to the Roman period (30 BC -391 AD). The last decoration dates from the reign of Trajan (53-117 AD).
The temple of Kom Ombo is the only one, among the five largest Greco-Roman temples (332 BC - 251 AD) built on Egyptian soil, to not have benefited from any modern architectural and archaeological study.
The study of this temple takes advantage of the fact that its structure was partially damaged, which allows to access information on construction techniques that we would otherwise not have been able to observe. It is thus part of a series of studies on the construction of cult spaces in Greco-Ro- man Egypt that have been carried out in recent years by several researchers. The analyses carried out on other much better preserved temples will allow to propose restitutions of lost structures, while this research will provide a better understanding of the techniques and methods of construction of this category of building. Thanks to the interoperability of the data, as well as comparative work, we will be able to propose a 3D restitution and an augmented rea- lity module encompassing several levels of reading within the framework of exploiting and sharing the data with the epigraphic team.

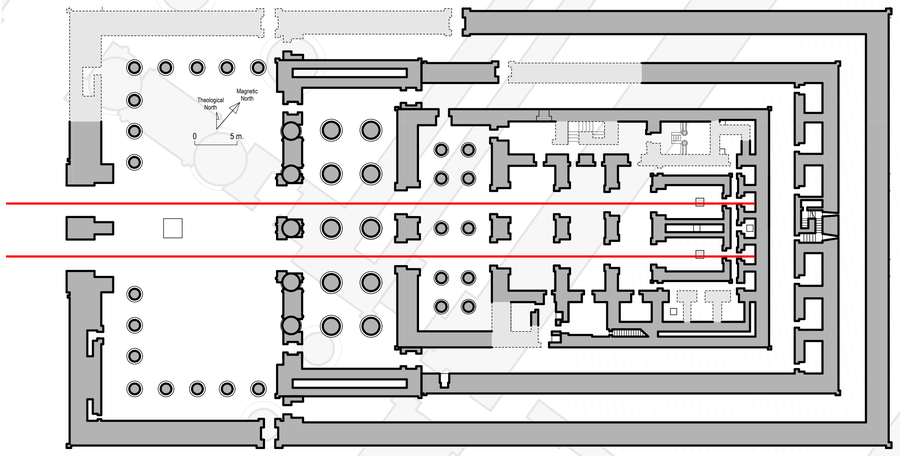


Quality construction relies on the foundations, since they allow the weight of the building to be distributed evenly and avoid differential settling, which can cause damage to the structures.
These surveys have several objectives:
- to enable static analyses of the current building
- to obtain additional information on the characteristics of the soil
- to shed light on the previous construction phases

In Kom Ombo, as in many other sites in Egypt, the first surveys were made during the Napoleonic campaign. Other plans were subsequently made, but none with absolute precision and never for analytical purposes.
Our prime objective will thus be to carry out a complete an accurate survey of the building, using photogrammetry and laser scanner, all set in a local topographic reference system, in order to then draw the entirety of the structures at 1:50 scale.
At the same time, we will classify, record and study all the scattered blocks in order to determine those belonging to the main temple, to place them in the envisaged restitution and to highlight them in the lapidary museum.


Axis of Harwer


Axis of Sobek



Archaeological survey

Architectural survey

Survey

Architectural study

Interoperable data

Analysis

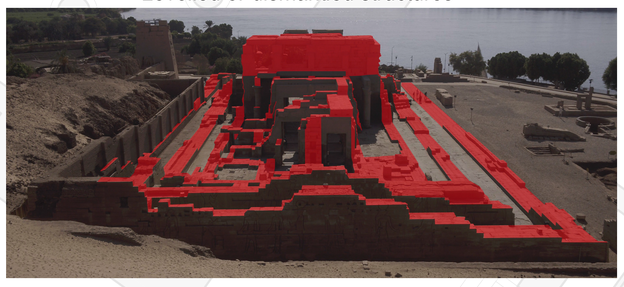
Structural elements analysis

Static analysis

Photogrammetry of sanctuaries
@Label News

BIM
Building Information Modeling

Levelled or dismantled structures



3D restitution

Drone flight
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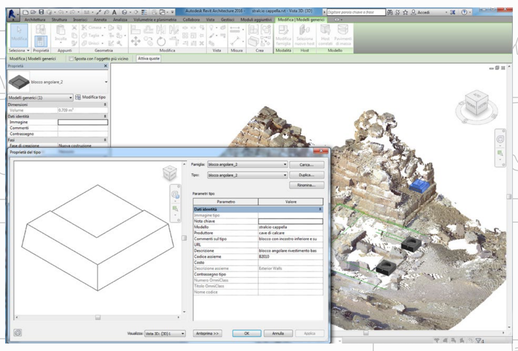
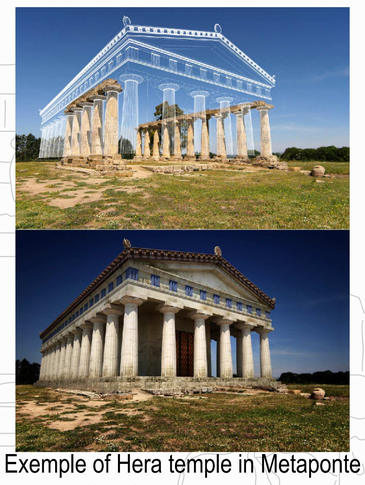
Augmented reality application

Modelling data and managing information



Niuserra temple (Egypt)
Bosco *et al.*, 2019

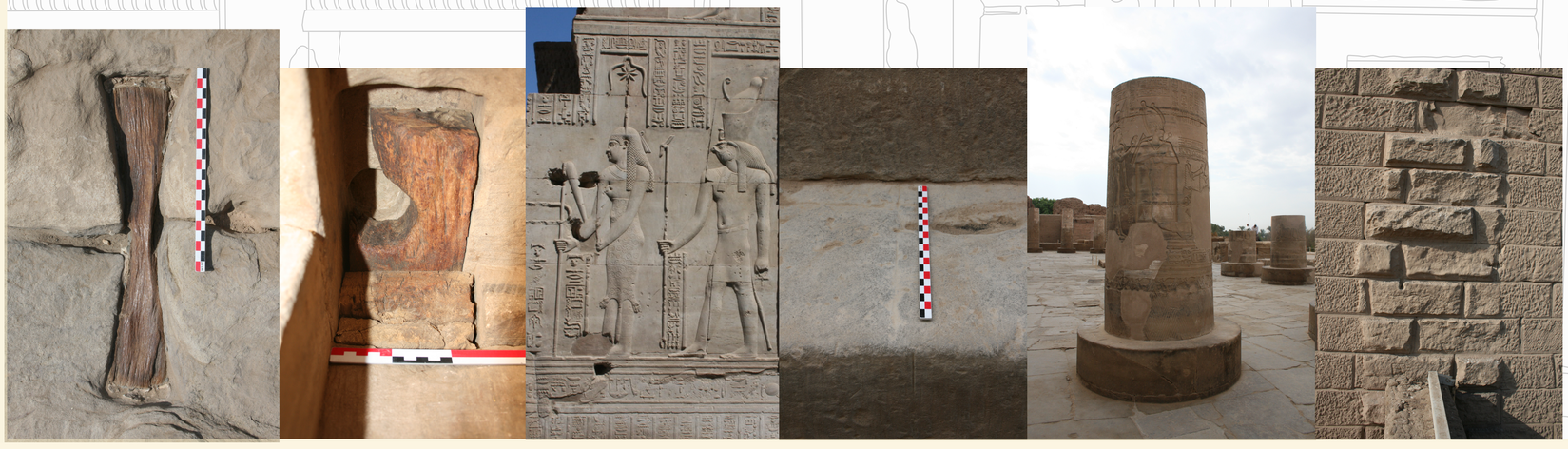


Exemple of Hera temple in Metaponte
@proloco_metaponto

Augmented reality will enable visitors to project themselves *in situ* into what the building may have looked like in its final phase of construction and thus better understand the lost elevations with the implementation of epigraphic data with several reading levels.

Architectural analyses will be carried out together with the survey. We will analyse the spaces (solids and voids), the structural elements (assembly with mortar and staples, crypts, lighting, roof slabs, lintels and architraves), the horizontal and vertical circulations and their restitution.

The static analyses will provide information on the resistance of the building to earthquakes and differential settlements. This part of the study will be carried out by means of mechanical analyses and digital simulations.



Advancing open research into the next decade
International Colloquium on Digital Archaeology in Bern
1st - 3rd February 2023, University of Bern, Switzerland

EPFL
ENAC
(school of Architecture, Civil and Environmental Engineering)

EPFL - LAPIS
(Art of Sciences Laboratory)

Interoperable data

EPFL - CNPA
(Laboratory of Numeric Cultures for Architectural Projects)

EPFL - LSMS
(Computational Solid Mechanics Laboratory)

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