



**FLAAR Reports**  
Maya Archaeology

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# Photogrammetric Methods for 3D Architectural Drawings



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During four days from the 20th to 24th of april 2009 three members of the FLAAR staff attended the first Architectural Digital Photogrammetry and GIS for National Heritage Conservation and Sustainable Development Workshop in Guatemala, (Taller Iberoamericano de Fotogrametría Arquitectural Digital y SIG para la conservación del Patrimonio Histórico, Cultural y Arqueológico de ciudades para una gestión de turismo sostenible)

This was organized by Universidad de San Carlos de Guatemala with the help of the Latin American Science and Technology Development Programme -CYTED- ; Universidad de Holguin, La Habana Cuba, Universidad Federal de Santa Catarina, Brazil and Universidad de San Carlos de Guatemala.



Lectures at the National Archaeology Museum, Guatemala City.



Members of the workshop during the field training in Iximche archaeological site

The workshop counted with the participation of the following professors:

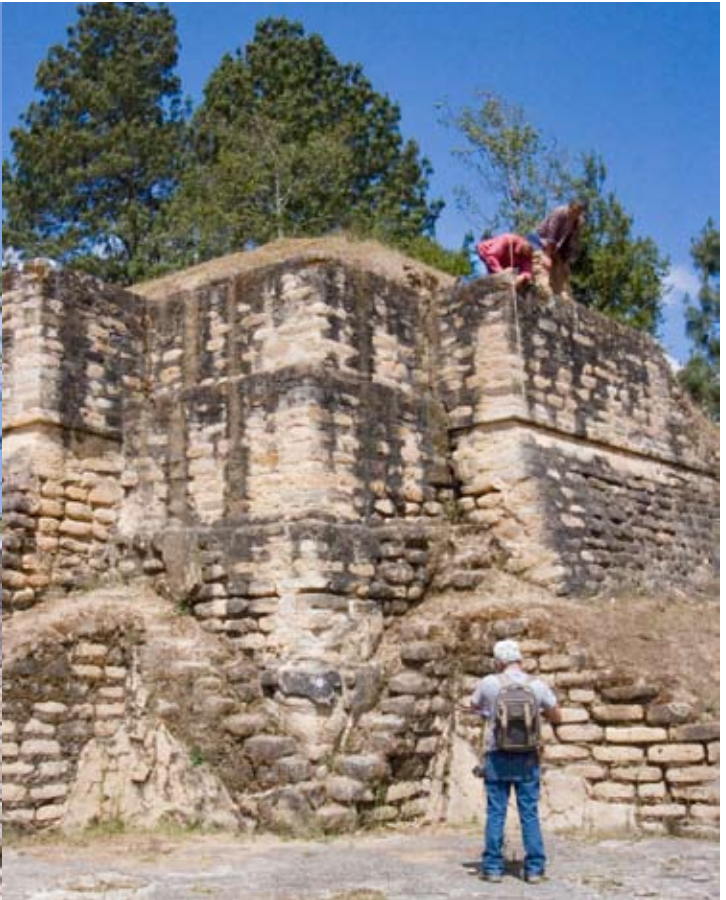
- Dr. Carlos Loch, Director laboratorio de Fotogrametria, Sensoramiento Remoto y Catastro Tecnico Multidisciplinario de la UFSC (Brasil).
- Dra. Pricscila Von Altroch UFSC
- Dr. Arq.Ing. Frank Navarro Tamayo UHOLM (Cuba)
- Dr.Inga. Ana Rodríguez, REFADC, Cuba.
- Ing. Carlos Zucatelli, UFSC (Brasil).
- Dr. Oscar Quintana, Maestria en Conservación, FARUSAC (Guatemala).



Edgar E. Sacayon from FLAAR (right) with Professor Loch from the Universidad Federal de Santa Catarina, Brazil, at Iximche archaeological site.



In order to generate accurate 3D models control points need to be placed in the structure, the control points will also appear in the photographs and are used for the software. Measurements of the building are taken to generate an accurate 3D model.





Luis Sacayon in brown t-shirt, learning how to use a Total Station, used to generate the CAD data used to get spatial information of the structure.

The workshop was held in the National Archaeology and Ethnology Museum of Guatemala and in the Archaeological site of Iximche and the Colonial Church of Tecpan.

The workshop was directed towards students and professionals interested in conservation and protection of our national heritage. More than 40 students and professionals in the field of Architecture, Archaeology and Engineering attended the workshop.

Photogrammetric methods can be used to generate 3D digital models of buildings, facades, archaeological sites and objects. This can be then linked to geodatabases and geographic information systems.



Rollei p3210 digital photogrammetric camera, used to take the photos to create a digital 3D model.

Photogrammetry is the science of obtaining information from images and has been used for geographic surveys or to create topographic maps, the same principles can be applied to buildings, facades or objects. Using pre-calibrated digital cameras like the Rollei and with precision made lenses a series of photographs are made of a building. These are combined with CAD data in Photomodeler software to generate 3D accurate models.

Control points and the Total Station are used to generate spatial information to create a 3D model of one of the altars in the church of Tecpan, Guatemala.





Members of the FLAAR staff in Guatemala, from left to right, Luis Sacayon (brown T-shirt), Antonieta Cajas (Black Shirt with glasses) and Edgar E. Sacayon (next to the Gitzo tripod with a baseball hat)

## Acknowledgments

We would like to thank Dr. Nicholas Hellmuth for encouraging us and facilitate our training during the workshop. FLAAR and FLAAR Mesoamerica are a source of information for digital technology and its applications in the field of archaeology, architecture and national heritage conservation.

For further information regarding our 3D scanning, printing and modeling projects please feel free to contact us

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