

# Terrestrial Laser Scanning for Cultural Heritage Recording

## Workshop scope

Terrestrial laser scanning (TLS) is a well established method for the acquisition of precise and reliable 3D space information for medium to large scale applications especially concerning Cultural Heritage objects. Terrestrial laser scanning is successfully used to acquire highly detailed surface models of objects like building facades, churches and other historical buildings, statues, jewels, artifacts, etc, useful for 3D representations, reproductions and object analysis. However, the research problems like automatic registration, feature extraction and 3D modeling are still investigated.

The workshop is planned to address the needs of interested persons to get a fast break-in course in Terrestrial Laser Scanning and its use for cultural heritage recording and documentation. The essentials of TLS systems will be briefly presented and focus will be given to hands-on experience for planning and executing fieldwork and processing of the point clouds later up to the final product.

The workshop hopes to bring together scientists and researchers from various disciplines, like architects, surveyors, archaeologists, civil engineers, etc and prospective end users, who lack special knowledge and experience on TLS uses and point clouds processing. Recent developments in laser scanner data processing and the potential of the technique and future trends in 3D data processing will be practically demonstrated.

## Workshop programme

**14:00-15:00**

**Introduction in 3D recording, Laser scanning, Point-cloud processing**  
***Prof. Ch. Ioannidis, A. Valanis***

The basic principles of laser scanning will be presented, together with the employed technology. A complete overview of the data acquisition process will be given, followed by a thorough presentation of point cloud processing. The theoretical part will conclude with the presentation of best practices in field work, i.e. selection of scan setups, target placement, avoiding pitfalls and swift quality control in the field.

**15:00-15:30** Coffee break

**15:30 – 17:00 Field Data Acquisition*****Prof. Ch. Ioannidis, Prof. A. Georgopoulos, A. Valanis***

A real condition experiment will be carried out at a nearby location. The practical task will include scanner setup layout, target placement, scanner installation, point cloud acquisition, target acquisition, target inspection and editing of annotations, inspection of the results in the field.

**17:00 – 19:00 Data processing – 3D modeling*****Prof. Ch. Ioannidis, A. Valanis***

Hands on experience which will drive participants through data preparation, target registration, cloud registration, weight selection and manipulation of constraints, mesh creation, mesh improvement, texture mapping and finally export of results.