



## GEOSPATIAL TECHNOLOGIES TO DOCUMENT ARCHAEOLOGY

Aristotle University of Thessaloniki (AUTH) the Faculty of Engineering, Laboratory of Photogrammetry and Remote Sensing, School of Rural & Surveying Engineering, in cooperation with AUTH School of History and Archaeology, hosted the summer school training in photogrammetry for cultural heritage documentation, on 19-30 June 2017, at Vergina and Thessaloniki, Greece.

The training was organized in synergy between the EU Erasmus+ HERITAG and German Baden-Württemberg supported BWS projects and the intensive course, organised by AUTH, Polytechnic University of Valencia (UPV) and Karlsruhe University of Applied Sciences (HsKA), attended by 20 HERITAG participants from Armenia (7, representing NUACA partner), Georgia (13, representing GTU, ISU, NACHPG and GeoGraphic) and 10 BWS students from UPV (2), AUTH (6) and HsKA (2). Total 42 participants including teachers from AUTH (8), UPV (2), HsKA (2) participated in the summer school.

The subjects covered by the summer school included documentation of an archaeological Eukleia site through photogrammetry (aerial and close range); laser scanning (terrestrial, mobile and desktop) and remote sensing. Introduction into the archaeological heritage context of the site was facilitated by AUTH School of History and Archaeology.



Co-funded by the Erasmus+ Programme of the European Union



The EU Erasmus+ project HERITAG aims to develop an interdisciplinary reform in higher education programmes at master level & continuing education by integrating Geoinformation Technologies (GiT) applied to cultural heritage documentation, tourism management and entrepreneurship.



Georgian professor tapping on intangible power of Aristotle's school of knowledge

## HERITAG@NEWS

### Visit us at

<http://heritag.webs.upv.es> in Spain  
<http://www.heritag.am> in Armenia  
<http://www.heritag.ge> in Georgia



Co-funded by the Erasmus+ Programme of the European Union



## HERITAG@NEWS

30 June 2017 / No 02



*Higher Education  
interdisciplinary  
Reform in Tourism  
management and  
Applied  
Geoinformation  
curricula  
HERITAG  
project  
eNews*

### Visit us at

<http://heritag.webs.upv.es> in Spain  
<http://www.heritag.am> in Armenia  
<http://www.heritag.ge> in Georgia



## LASER SCANNING

In the Eukleia area and at the ancient Theater structure measurements were made with the Laser Scanner. For data geo-referencing GCPs were acquired in the field with GPS, initial visualisations demonstrated at the AUTH Vergina excavation lab and full data processing completed in Thessaloniki.



## MOBILE MAPPING

Measurements were carried out with mobile mapping system, integrating laser scanner technology, cameras, odometer, inertial and satellite navigation for laser data acquisition, photogrammetric 3D data processing with stereoscopic 3D GIS interface and fast data collection. It is a very robust and low-cost capture methodology, while achieving a high level of accuracy.



## DOCUMENTING ARCHAEOLOGY WITH COPTER DRONES

Eukleia archaeological site documented with copter drone, including ground control points measured on-site with GPS. In AUTH Vergina lab initial data analysis was conducted. Upon completion of final products (DSM and ortho-image) model was printed in 3D at the AUTH laboratory in Thessaloniki.



Site orientation by AUTH archaeologist

## DATA PRODUCTION WORK AT AUTH PHOTOGRAMMETRY LAB

- *Drone and Remote Sensing*
- *Laser macro and micro scanning*
- *Ground and aerial photogrammetry*
- *Geographic Information System*



## Fixed-wing drone site archaeological survey

Sanctuary of Eukleia and Theatre, covering a larger area of 10 hectares, was documented through accurate measurement using eBee fixed-wing drone. Spatial analysis at different scales was conducted at AUTH field lab with subsequent production of complete 3D model and orthoimage at Thessaloniki laboratory.

**HERITAG@NEWS**

30 June 2017 / No 02

**Visit us at**

<http://heritag.webs.upv.es> in Spain  
<http://www.heritag.am> in Armenia  
<http://www.heritag.ge> in Georgia