

## **From Detection of Underground Archaeological Relics to Monitoring of World Heritage Sites in Danger: Ongoing Research Activities in the Frame of the ATHENA Twinning Project**

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### **Abstract**

The “ATHENA” twinning project aims at establishing a Center of Excellence in the field of Remote Sensing for Archaeology and Cultural Heritage, through a cooperation between the Remote Sensing Research Laboratory at the Cyprus University of Technology (CUT), the Institute of Archaeological and Architectural Heritage of the National Research Council of Italy (IBAM- CNR), and the German Aerospace Centre (DLR). This paper focuses on the joint research carried out in the first year by DLR and CUT. Different achieved results can be ordered chronologically, according to the stage of exploitation for an archaeological site. First of all, a site of archaeological interest must be discovered and defined: to aid in this process, a quantitative ranking of spectral indices to identify buried archaeological relics in hyperspectral images is proposed. Subsequently, information must be catalogued and stored: in the frame of the ATHENA project, efforts have been made to organize the information acquired with a spectrometer in laboratory on mosaics tesserae retrieved in Cyprus in a coherent spectral library. Finally, heritage sites must be constantly monitored, and this could be difficult for non-accessible areas such as conflict zones. For this purpose, the first steps have been made towards the automatic detection of damages to cultural heritage sites from space, based on texture descriptors in remotely sensed images.