



TECHNOHERITAGE

2019

IV INTERNATIONAL CONGRESS

SCIENCE AND TECHNOLOGY FOR THE CONSERVATION OF CULTURAL HERITAGE

SEVILLE MARCH 26-30, 2019

BOOK OF ABSTRACTS



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PREFACE

The influence of technological and scientific advances in the management of cultural heritage are taking place at an ever-increasing pace. In the last decades, systems of auscultation, prospecting, modeling, representation, data management, and material analysis have reached unprecedented relevance. Digital technologies enhance, quantitatively and qualitatively, the possibilities to approach historical heritage; furthermore, they are opening new ways of interpreting and disseminating it.

New horizons are opened and, therefore, it is possible the incorporation of very diverse viewpoints on heritage issues from specialized disciplines, each of them with their own languages and algorithms. This multidisciplinary approach deepens the processes of heritage management, but also makes them more complex and hard to interpret as a whole. Furthermore, the problems of the management and preservation of increasingly specialized heritage information and documentation are being reported since a few years ago.

Technoheritage, the Network on Science and Technology for the Conservation of Cultural Heritage (1) started up in March, 2011, joining seventy seven research groups and institutions, which are organized in three activity areas: research groups of CSIC, Spanish National Research Council (Consejo Superior de Investigaciones Científicas in Spanish) and several Spanish universities; cultural institutions, foundations and museums; and sector companies. Technoheritage aims to support the cooperation between the agents of the science-technology-companies system in order to share ideas and experiences easily, helping to solve problems and allowing technology transfer, with the common objective of contributing to the conservation of Cultural Heritage.

Technoheritage activities are focused in: 1) the promotion of the different groups by means of activities coordination, currently dispersed in different scientific areas; 2) the achievement of the institutional recognition of the activities and promotion of the member groups through priority actions; 3) the promotion of collaboration between the groups in order to create a critical mass via their association in national and international research projects; and 4) the projection of Technoheritage by means of the cooperation with other similar European groups in order to ease the access to consortiums and international projects.

This International Congress of Science and Technology for the Conservation of Cultural Heritage is developed in the context of the Technoheritage network activity. In this 4th edition, it is also supported by IAPH, Andalusian Institute of Historic Heritage (Instituto Andaluz de Patrimonio Histórico in Spanish). This Congress is an international meeting for researchers and specialists in different areas that share the interest in knowledge and preservation of the Cultural Heritage, including sessions focused in architectural heritage, and in digital strategies and tools for decision-making.

Contributions about advanced technologies and materials will be presented, as well as edge topics of this field as heritage management, social impact, risks and vulnerability, highlighting the role and impact of digital technologies in knowledge, protection, conservation, management and dissemination of Cultural Heritage. Digital technologies will not be considered just as enhanced tools for traditional methodologies in Cultural Heritage, but also as a driving force for deep changes in those methodologies and in the way that heritage is understood and communicated, offering a new horizon of strategies for its sustainable conservation.

The Congress and its topics structure emerge from the actions programmed in two I+D+i projects funded by the current Ministry of Science, Innovation and Universities of Spain, both project teams have closely cooperated in its organization, counting on the active participation of IAPH team. One of these projects is Art-Risk (2), leaded by PhD Pilar Ortiz Calderón from University Pablo de Olavide, and the other project is TUSOSMOD (3), leaded by PhD Francisco Pinto Puerto from University of Seville. Both researchers are the directors of this Congress, coordinated by PhD Manuel Castellano Román.

(1) TechnoHeritage has been funded by the Ministry of Science, Innovation and Universities (Action HAR2010-11432-E), the State Research Agency (Ministry of Economy, Industry and Competitiveness; (Networks of Excellence 2016, HAR216-81748-REDT) and the own resources of the participating groups. More information in the web: <http://www.technoheritage.es/>

(2) Project BIA2015-64878-R of the Universidad Pablo de Olavide (UPO)
: www.upo.es/investiga/art-risk/

(3) Project HAR2016-78113-R of the Universidad de Sevilla (US):
www.grupo.us.es/tusosmodhum/

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Non destructive techniques applied to the study of Maqsurah at Cordoba Cathedral (Spain)

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Abstract:

Andalusian Institute for Cultural Heritage was in charge of the scientific and technical studies of Maqsura in the Mosque-Cathedral of Cordoba (Spain).

The Maqsura and the Mirhab are one of the most outstanding locations of the Mosque-Cathedral built during the reign of caliph Al-Hackam II, from year 962 to 966 AD.

Using ART4ART [1], INOE's mobile laboratory, a program of smart investigations were conducted on Maqsura at Cordoba Mosque-Cathedral (Spain) inside the research collaboration agreement among IAPH-UPO.

The purpose was not only to obtain the maximum possible amount of information, but also to allow corroboration with the data gathered in other investigation campaign.

The infrastructure used covers a wide range of equipment that can be divided into 3D digitization, elementary and molecular physicochemical analysis, LDV (laser Doppler vibrometer) and investigation methods (GPR). 3D digitization using photogrammetry offers the possibility to digitally manipulate the models and observe small details on the object's surface, but also to analyse the monument degradation in time, by subsequent 3D models of the same areas. Elementary and molecular physicochemical analysis were used for material identification which will also be used, in time, to create a data base for fast material recognition. LDV (laser Doppler vibrometer) is a non-destructive and non-contact technique based on recording the answer of materials to different sound wave in order to evaluate deformations, cracks and other damages on the mosaics.

The ground penetration radar (GPR) is a non-invasive geophysical method used for in depth investigations by emitting and studying the propagation of electromagnetic pulses, to highlight the heterogeneity or discontinuities of the electrical properties of the propagation medium. This technique is mostly used on the soil surface, but can also be used to acquire state of preservation by non-contact, non-invasive, non-destructive means.

This multidisciplinary approach based on non-destructives techniques highlights the necessity of combined technology for a holistic study of building without sampling to revealed the conservation degree of the mosaics, subsoil and walls.

[1] M. SIMILEANU, W. MARACINEANU, J. STRIBER, C. DECIU, D. ENE, L. ANGHELUTA, R. RADVAN, R. SAVASTRU, Advanced research technology for art and archaeology—ART4ART mobile laboratory, JOURNAL OF OPTOELECTRONICS AND ADVANCED MATERIALS Vol. 10, No. 2, February 2008, p. 470 - 473

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