



The environmental monitoring of Cultural Heritage through Low Cost strategies: The frescoes of the crypt of St. Francesco d'Assisi's, Irsina (Basilicata, Southern Italy)

Maria Sileo, Fabrizio Gizzi, and Nicola Masini

IBAM-Istituto per i Beni Archeologici e Monumentali, CNR, Tito Scalo (PZ), Italy, email: (m.sileo; f.gizzi; n.masini)@ibam.cnr.it

One of the main tools of assessment and diagnosis used to define appropriate strategies for the preservation of cultural heritage is the environmental monitoring. To achieve an environmental monitoring are needed high costs of purchase and maintenance, high costs of instrumental and for the management of the plants and processing of results. These costs imply that the technologies for environmental monitoring are not as common but their use is limited to the study very famous monuments or sites. To extend the use and dissemination of such technologies to a greater number of monuments, through the project Pro_Cult (Advanced methodological approaches and technologies for Protection and Security of Cultural Heritage) a research aimed at testing low cost technologies has been performed. The aim of the research is to develop low cost monitoring systems, assessing their effectiveness in a comparative way with commercial high cost ones. To this aim an environmental monitoring system using the Arduino system was designed and developed. It is an electronics prototyping platform based on open-source hardware and software flexible and user friendly. This system is connected to sensors for the detection of environmental parameters of non high purchase cost but with respect to the medium potential detection sensors accurately. This low cost system was tested in the framework of a microclimate monitoring project of the crypt of St. Francis of Assisi in Irsina (Southern Italy) enriched by a precious cycle of medieval frescoes.

The aim of this research was to compare two monitoring systems, the first, at low cost, using Arduino system, and the second, a standard commercial product for a full yearly cycle and assess the reliability and the results obtained by the two systems. This paper shows the results of the comparative analysis of an entire monitoring yearly cycle in relation to the problems of degradation affecting the paintings of medieval crypt [1]. The obtained results proved the capability and reliability of the designed low cost monitoring system for investigating the indoor microclimate in relation with decay pathologies.

Acknowledgements

The authors thank Basilicata Region for supporting this activity in the framework of the Project "PRO_CULT" (Advanced methodological approaches and technologies for Protection and Security of Cultural Heritage) financed by Regional Operational Programme ERDF 2007/2013

[1] M. Sileo, M. Biscione, F.T. Gizzi, N. Masini & M.I. Martinez-Garrido, 2014 - Low cost strategies for the environmental monitoring of Cultural Heritage: Preliminary data from the crypt of St. Francesco d'Assisi, Irsina (Basilicata, Southern Italy). Science, Technology and Cultural Heritage, Edited by Miguel Angel Rogerio-Candelera, 27-34. ISBN: 978-1-138-02744-2.