



## **Wireless sensor networks evaluation for heritage monitoring; in the development of decay detecting techniques for a preventive conservation**

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Monitoring systems using sensor techniques are widely used in the field of cultural heritage. In recent decades, the use of monitoring techniques involving sensors has been evolving in a wide way, because of the increasing importance they have in the observation of decay phenomena in order to establish predictive strategies to promote a preventive conservation. Wireless sensor networks, formed by a group of sensors nodes or monitoring points which have wireless communication, allow us a great number of nonexistent advantages until now since they have an easier way of installation, maintenance and fault detection versus wired networks previously used, with the costs reduction and the increase of reliability in measurement systems that this fact entails.

To assess the suitability of wireless sensor networks it is necessary to take into account many factors since heritage is a very demanding field. This paper evaluates the quality of communications in various deployments of heritage interest, both architectural and natural heritage, of a competitive wireless sensor networks platform which has been subjected to different conditions of range in demanding monitoring environments. To measure the communication quality, multiple parameters for the characterization of the received signal and the links were taken into account, such as the RSSI, which measures the power level of the received signal and the percentage of correctly received messages, among others.

Additionally, it will be also of relevance to achieve a long-term and low energy monitoring, since measured parameters do not undergo significant variations in short periods of study, so that the evaluation includes energy and consumption aspects of wireless sensor networks systems, establishing a final assessment methodology for this type of technology applied to the heritage monitoring field. Furthermore some design software / hardware aspects are evaluated for an appropriate validation of the system from the point of view of the end user.

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