

Smart monitoring of historic structures

Start date:2008-12-01

End date:2011-11-30

Project Acronym:SMOOHS

Project status:Execution

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Description

Objective: Historic structures are often of extraordinary architecture, design or material. The conservation of such structures for next European generations is one of the main future tasks. To conserve historic structures it is more and more required to understand the deterioration processes mainly caused by the environment. In certain cases continuous monitoring systems have been installed to obtain information about the deterioration processes. However, most of these monitoring systems were just weather or air pollution data acquisition systems and use only basic models for data analysis.

The real influence of the environment to the structure or the structural material is often unaccounted for. That means that the structural resistance is just calculated from the measurements and not determined by sufficient sensors. Another aspect is the fact that most monitoring systems require cabling, which is neither aesthetically appealing nor in some cases applicable due to the needed fastening techniques. The proposed project aims at the development of competitive tools for practitioners which goes beyond the mere accumulation of data. Smart monitoring systems using wireless sensor networks, new miniature sensor technologies (e.g. MEMS) for minimally invasive installation as well as smart data processing will be developed.

It will provide help in the sense of warnings (e.g. increase of damaging factors) and recommendations for action (e.g. ventilation or heating on/off, etc.) using data fusion and interpretation that is implemented within the monitoring system. The development will consist of small smart wireless and robust sensors and networks, with sensors for monitoring of e.g. temperature, humidity, air velocity, strain and crack opening, acoustic emissions, vibration, inclination, chemical attack, ambient and UV light, with built-in deterioration and material models, data pre-processing, and alarm functions to inform responsible persons about changes of the object status.

Achievements:

General information:

Project Details

Start date:2008-12-01

End date:2011-11-30

Duration:36 months

PJ_REF:212939

Project cost:1839951 EURO

Project Funding:1404993 EURO

Programme Acronym: [FP7-ENVIRONMENT](#)

Programme type:Seventh Framework Programme

Subprogramme Area:Damage assessment, diagnosis and monitoring for the preventive conservation and maintenance of the cultural heritage

Contract type:Small or medium-scale focused research project

URL:

Subject index:Environmental Protection, Social Aspects

Other Indexes:sensors,monitoring,Wireless sensor networks,FE modelling,lifetime prognosis

Other participants

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