

Artguardian: Watchman for artworks

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Fraunhofer researchers have developed a fully automated, intelligent monitoring system helping art lovers to optimally preserve their objects of art. Credit: Fraunhofer ISST

A publicly displayed object of art experiences a lot: Dazzling light, unfavorable temperatures or too much moisture. With 'Artguardian' Fraunhofer researchers have developed a fully automated, intelligent monitoring system helping art lovers to optimally preserve their objects of art. Thanks to sensitive sensors they can be exhibited under the best conditions. The solution will be presented from 6th to 10th March at the CeBIT 2012.

There are an estimated 150 million works of art in the market today – in museums, public spaces and in the holdings of private collectors. Not only because of their material value, but also because of their intangible value they deserve to be handled carefully. However, neither artists nor

museums or collectors want to protect artwork from detrimental influences by keeping it in a climate-controlled safe. Art needs the public.

By combining modern technologies from the fields of microelectronics, building physics and information technology, three Fraunhofer Institutes and their partners have now developed a solution that meets the challenges that arise: "Artguardian consists of four sensors invisibly attached to the work of art; they register temperatures, humidity, lighting [conditions](#) and any bumps or movements", observes Dr. Stephan Guttowski from the Fraunhofer Institute for Reliability and Microintegration IZM in Berlin. "It forwards data at regular intervals to a base station located near the work."

The base station is linked with an IT platform to which the owner or curator has immediate access at all times via smart phone. This permits real-time monitoring of the ambient conditions to which the artwork is subjected at any given time. If set thresholds are exceeded, the system sounds an automatic alarm. And if there does not happen to be a base station nearby - during transport, for instance - the sensor records the values for readout later on.

The light sensors call for a very special technology. As the sensor cannot be affixed onto the surface of the painting itself, researchers from the Fraunhofer Institute for Applied Polymer Research IAP are developing a pane of glass coated with polymers which will be placed in front of the artwork. This thin layer reflects a part of the incident light towards the tiny sensors hidden under the frame." In this way, we can measure a light matrix that permits conclusions about overall lighting conditions", explains Stephan Guttowski.

»Each work of art calls for specific conditions depending not least on the work's condition and age and the materials used to create it«, Ralf Kilian

from the Fraunhofer Institute for Building Physics IBP in Holzkirchen (Germany) points out. This is why Artguardian comes equipped with a detailed set of rules for art conservation which is based on data collected by the IBP conservator team by means of their long lasting experience. This makes it possible to assess potential risks individually and to give necessary recommendations for the conservation of the artworks.

Trust is good, control is better

A complex logistical process comes into play when a work of [art](#) is placed on loan for an exhibition - a process where owners of artworks have had to rely on outside experts. "Artguardian changes this situation«, says Dr. Volker Zurwehn, deputy director of the Fraunhofer Institute for Software and Systems Engineering ISST, located in Dortmund, Germany. "The IT platform gives the owner an opportunity to monitor the conditions to which his or her artwork is exposed. In a further step, building-control technologies could be linked to the system, in order to adjust the indoor climate conditions automatically".

Various notable museums have already expressed an interest in this technology. Initially, samples will be taken over a period of three months to provide evidence, for instance, on the impact of environmental conditions on the deterioration of various materials.

Provided by Fraunhofer-Gesellschaft

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