



## ARTGUARDIAN: CUTTING-EDGE TECHNOLOGY PROTECTING ARTWORKS AND CULTURAL ASSETS

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Projectpartners:

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[www.artguardian.de](http://www.artguardian.de)

### WHY ARTGUARDIAN?

Custodians of high-quality artwork, be they private collectors or state museums, share the common interest in conserving the value of the pieces and the desire to exhibit them. **ARTGUARDIAN** meets those contradictory demands.

Conserving, loaning and exhibiting a piece of art pose a huge challenge:

- Conserving an artwork requires precise understanding of the optimal microclimatic conditions to which it is exposed to. These conditions depend on a variety of factors, not least of the history and age of the artwork along with the materials used to create it.
- As loaning an artwork for an exhibition or selling it are complex, impenetrable logistic processes, the individual is

forced to rely on third parties. The microclimatic conditions and their stability at the individual exhibition site of the artwork are mostly a matter of trust and not guaranteed.

- Although institutional owners such as museums have conservation expertise and experience in organizing international exhibitions, much room for improvement remains. The processes employed to date are extremely labor-intensive, precluding the loaning of several artworks at once.

By combining cutting-edge technologies in microelectronics, building physics and information technology, Fraunhofer researchers and their partners have developed a solution that meets the challenges of all three areas: **ARTGUARDIAN**.



## THE SOLUTION

**ARTGUARDIAN** comprises three components:

- 1 An integrated set of *preventive conservation protocols* to assess an individual object's possible risks and the required conservation measures (**preventive conservation**).
- 2 A range of *autarkic sensors* that measure the microclimatic conditions the artwork is exposed to (**invisible sensors**).
- 3 An *IT platform* with which the owner and other authorized persons can stay apprised of the artwork's location, condition and the stresses it encounters (**Art Guardian Cloud**).

## PREVENTIVE CONSERVATION

Conserving valuable artworks is a never-ending battle against decay. But not all objects have the same requirements. For example, the humidity levels an oil painting can be exposed to is extremely limited, whereas a sculpture made from synthetic materials is instead much more affected by certain spectral components of light. Many of these factors are highly interdependent and can only be assessed in combination.

This is challenging to both private collectors and to conservation departments of museums housing an immense number of different objects. Thus, an efficient and effective process for analyzing the actual conditions an artwork is exposed to in order to estimate its endangerment is a key goal. Such a process would allow conservators to determine an object's individual risk potential and the corresponding conservation measures.

## INVISIBLE SENSORS

The environmental conditions relevant to the conservation of an object are recorded by a number of different sensor systems during exhibition, transport and at the depot. Which data is collected is dependent on the material of the artwork. The basic approach comprises autarkic sensor systems attached to the artwork that record the microclimatic conditions. Equipped with self-sufficient power supplies, data processing units and wireless interfaces, the systems will include acceleration, temperature, humidity and light sensors.

In addition to the sensor systems, a base station with a continuous power supply is placed nearby. This unit collects the sensor data and relays it to the Art Guardian Cloud (e.g. via WLAN or GSM/CDMA/3G).

## ART GUARDIAN CLOUD

The Art Guardian Cloud serves as the central information and communication platform. It stores the conservation data and keeps the owner up-to-date on the object's condition, the stresses it undergoes, and the ideal environmental conditions for maintaining its value. If desired, the information can even be transmitted to mobile devices such as the iPhone.

The Art Guardian Cloud has an additional feature: The pieces can be inventoried by adding text descriptions and photos, and the information can subsequently be used as teaching material. Artwork can also be made available for loan via the cloud and a directory of certified transportation services, exhibition spaces and art warehouses is planned. With all these features, **ARTGUARDIAN** promises a global market-place of art and exhibition services that affords even small industry players the chance to operate internationally.

## PROTECT YOUR ARTWORK BY BECOMING A PILOT PARTNER.

We are currently seeking partners for the preliminary phase of **ARTGUARDIAN**. Pilot partners have the opportunity of testing the system and have access to a range of multifaceted marketing initiatives. Please feel free to contact us for more information.