



Intelligent Artwork Protection

How Museums protect cultural Heritage preventively and invisibly

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Contents

1	Executive summary	03
2	Current state of exhibit protection	04
2.1	The Dilemma: Security vs. accessibility	04
2.2	The changing threat landscape	04
2.3	Operational challenges	05
3	Rethinking artwork protection	06
4	The technology solution: Video analytics as a lever	07
4.1	Making smart use of existing infrastructure	08
4.2	Applying video analytics to artwork protection	09
4.3	Data privacy as a core competency	10

1. Executive summary

Preserving cultural heritage puts museums in a constant conflict between maximum security and open accessibility. Physical barriers protect artworks, but they disrupt the aesthetic experience and undermine direct engagement with the art. At the same time, the threat landscape has shifted: alongside nighttime break-ins, risks during regular visitor hours - such as vandalism, carelessness driven by "selfie culture," or activist actions - have increased dramatically.

Classic security concepts are reaching their limits in daily operations. Traditional security camera systems act purely reactively, documenting damage only after the fact. The entire burden of prevention falls on security staff, who are already stretched thin by staff shortages, hard-to-monitor spaces, and fatigue. Conventional motion detectors also frequently trigger false alarms due to shadows or changes in light, which further compounds alarm fatigue.

To effectively protect cultural treasures, institutions must move toward proactive, real-time management. Where physical barriers disrupt the visitor experience and staff are stretched thin, AI-based video analytics offers a powerful alternative. Solutions like Isarsoft Perception use existing camera infrastructure to detect approach or touch attempts in real time via virtual protection zones. Two-stage alerts allow staff to intervene before any damage occurs. Visitor identities also remain fully GDPR-compliant at all times.

This whitepaper offers a practical overview of how museums can meet modern security requirements while preserving an open, welcoming atmosphere.

2. Current state of artwork protection

Preserving cultural heritage forms the fundamental basis of all museum work, while at the same time museums bear responsibility for protecting their collections from a wide range of risks.

2.1 The dilemma: Security vs. accessibility

Museums constantly face the conflicting goals of preserving art treasures while making them publicly accessible. Modern art education thrives on making exhibits feel as close, immediate, and authentic as possible for visitors. Physical barriers such as cordons, railings, or thick protective glass do secure objects, but they disrupt the overall aesthetic experience, distort the sense of space, and create visual distance between the artwork and the viewer. Security and operations leaders are therefore challenged to strike a balance between protection and openness.

“Museum security matters so much today because the threat landscape has become so multifaceted. Museums need to do everything they can to professionalize in this area.”

Prof. Dr. Eckart Köhne, Director of the Badisches Landesmuseum, Interim Director of the Staatliche Kunsthalle Baden-Baden

2.2 The changing threat landscape

This balancing act is made even harder by a shift in risk factors. Large and small museums alike remain targets for nighttime break-ins or organized crime, as shown by the spectacular thefts at the Louvre, the Green Vault, and the Bode Museum.

But in recent years, the danger has also spread into regular opening hours, right in the middle of visitor traffic: activist-motivated incidents like those involving the “Mona Lisa” or Van Gogh’s “Sunflowers,” along with vandalism and carelessness driven by “selfie culture,” make this clear.

2.3 Operational challenges

The shifting risk profile hits museums right in the middle of daily operations. Until now, security during opening hours has relied on a proven combination: on-site security staff in the exhibition rooms, supplemented by classic video surveillance. But in today's operating environment, this two-pronged strategy increasingly reveals its functional limits.

Conventional video surveillance acts purely reactively and forensically — that is, it documents damage after the fact instead of preventing it as it happens. The entire burden of real-time prevention therefore falls on security staff, who face increasingly complex tasks in daily operations:

- **Unintentional over-approach:**
Visitors get too close to paintings to study details.
- **Interaction:**
Children or inattentive visitors try to feel the texture of artworks.
- **Staff shortages:**
Insufficient staffing leads to gaps in surveillance coverage.
- **Fatigue & error proneness:**
Security staff cannot keep every corner and every exhibit in view at all times. Reaction time is too slow, and once attention wanes, the likelihood of errors rises.
- **False alarms:**
Conventional motion detectors frequently trigger false alarms, for example due to changes in light or shadows.
- **Visible protection:**
Barriers such as cordons or glass disrupt the aesthetic experience.

3. Rethinking artwork protection

To address these operational challenges, museums must move from passive documentation to proactive, live prevention. Where structural, organizational, and staffing measures reach their limits, modern security technology offers a highly effective and cost-efficient solution. If security staff can only react once physical contact with the exhibit has already occurred, it's already too late in an emergency. Modern exhibit protection therefore requires a paradigm shift. The operational value can be measured using the following indicators:

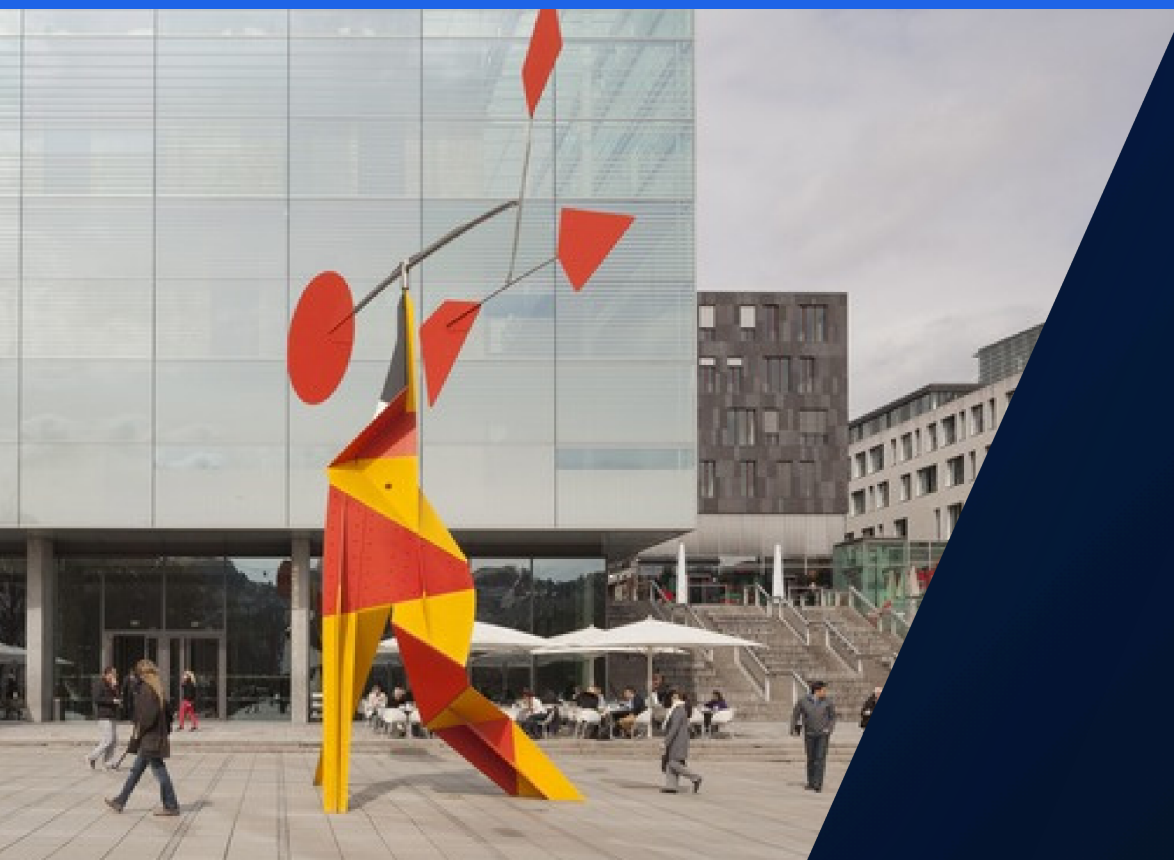
KPI	Description	Operational relevance
Reaction Time	The time from crossing the virtual protection zone to the security staff being alerted.	Enables staff to intervene before an exhibit is touched or damaged.
False Alarm Rate	The share of false alarms out of the total number of alarms.	A low rate prevents alarm fatigue and ensures a response to genuine alarms.
Coverage	Share of the exhibition floor that is monitored.	Complete coverage without blind spots and without physical barriers that restrict the visitor's visual experience.
Dwell Time	The length of time visitors spend in front of exhibits or in exhibition rooms.	An additional benefit for optimizing visitor flow, staffing, and space planning.

4. The technology solution: Video Analytics as a lever

The key to preventive and invisible exhibit protection lies in real-time data that relieves on-site staff while still allowing an unrestricted visitor experience. Using AI-based video analytics, such as Isarsoft Perception, museums and galleries can turn their existing camera infrastructure into a precise security instrument.

With Isarsoft, we can preserve the inviting, open atmosphere for our visitors while increasing preventive security for our masterpieces. Thanks to the accuracy of the detection and the resulting reduction in false alarms, we're able to relieve the burden on our security staff.

Rudi Schweizer, Technical Project Coordination



4.1 Making smart use of existing infrastructure

Unlike hardware solutions or structural investments, AI-powered video analytics builds on infrastructure that already exists: the museum's own security cameras.

By connecting modern AI algorithms to the existing video streams, visual monitoring becomes automated. The software continuously “watches” and analyzes visitor behavior, translates the video footage into anonymous metadata, and feeds it into the museum's central management systems.

Artwork protection at Kunstmuseum Stuttgart

Goal:

Reliable, automated alerting for touch attempts.

Result:

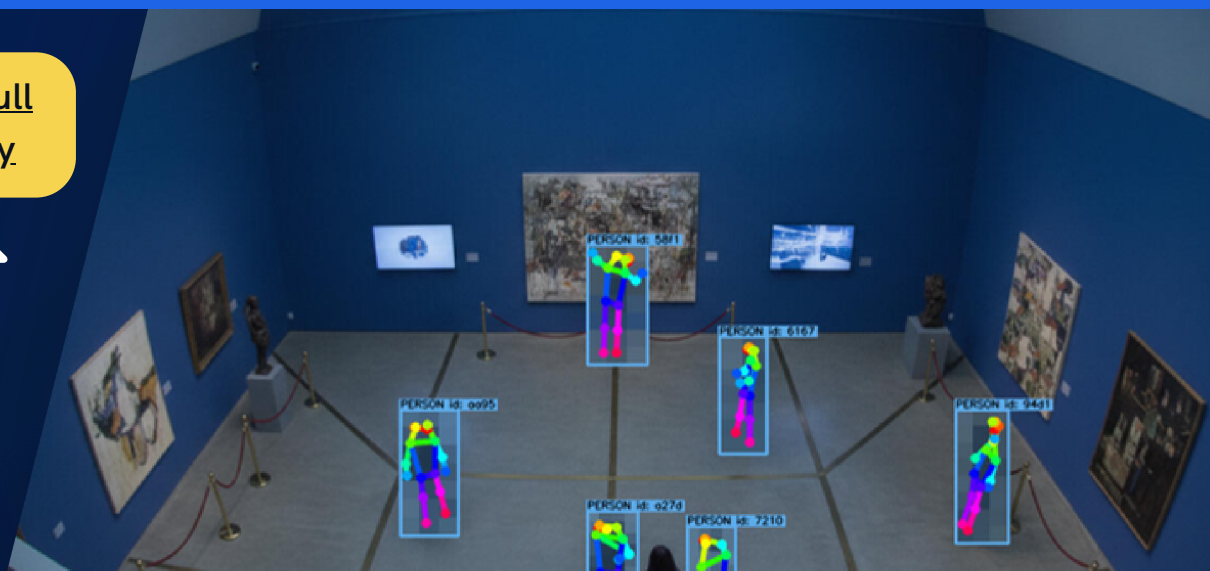
A reliable safeguard for the preventive protection of exhibits at approx. 1/3 the cost compared to LiDAR sensors.

Implementation:

1. Virtual protection zones in front of the paintings.
2. Real-time distinction between a visitor moving normally and a deliberate reach toward a painting.
3. Two-stage alerting: audio cue for visitors + alarm to security staff with live footage.

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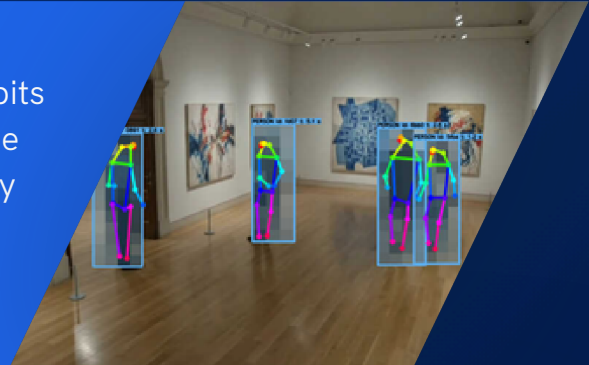
[Read the full case study](#)



4.2 Applying video analytics to artwork protection

Approach and touch attempts

If the virtual protection zones in front of exhibits are crossed, an acoustic warning sounds in the exhibition room and an alert is sent to security staff. The skeletal representation of people increases accuracy.



Warnings for unusual behavior

The software detects unusually long dwell times, objects being set down, or similar behavior, and preventively alerts security staff.



Support during high visitor traffic

In popular, densely crowded exhibitions where staff can lose track, the software automatically assists with real-time occupancy indicators.



4.3 Data privacy as a core competency

In Europe, the introduction of innovative solutions in cultural institutions often fails due to strict data privacy hurdles and internal requirements. Visitor identities must be protected at all times. For video analytics software, this is made possible through anonymized video streams and the exclusive processing of metadata.

At Isarsoft, data privacy and information security are not an afterthought but a fundamental part of the core architecture. Because biometric profiles are never created, stored, or matched at any point, the technology is 100% GDPR-compliant. The voluntary ISO 27001 certification further speeds up legal and operational approvals for security management at museums. The following measures are taken to protect data privacy:

1. No biometric data
2. Real-time pixelation
3. Irreversible anonymization
4. Static restricted zones



ISO 27001
CERTIFIED



GDPR
COMPLIANT



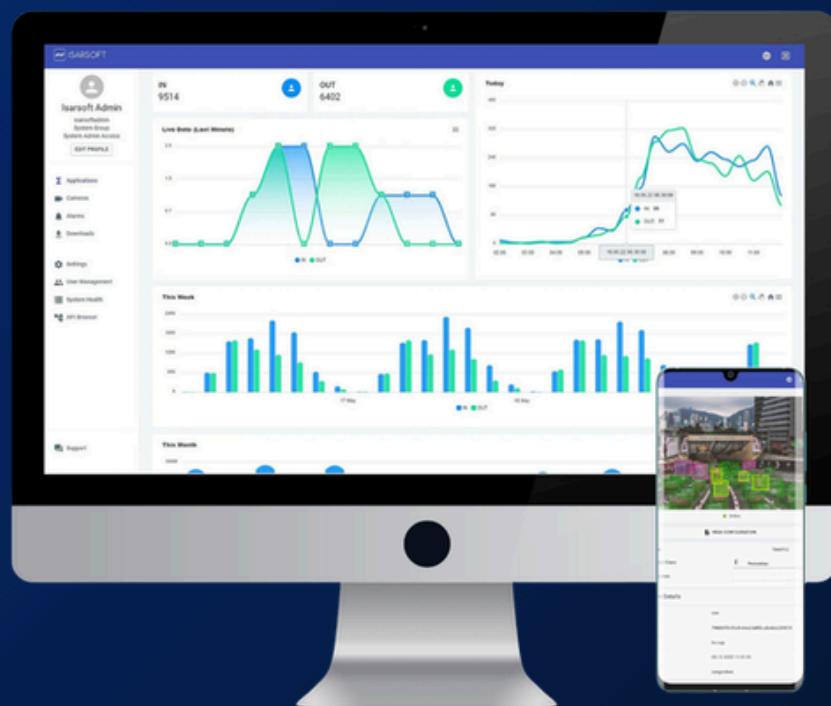
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About Isarsoft

Based in Munich, Isarsoft has built its reputation as a reliable partner in video analytics since 2019. Its mission: to unlock the potential of existing security camera systems using artificial intelligence.

Known for reliability, flexibility, user-friendliness, and versatile integration options, Isarsoft helps museums and cultural institutions optimize operational processes, increase safety, and strengthen customer satisfaction. Starting with people counting, its portfolio today spans more than 10 use cases, including queue management, object detection, path analysis, demographics, and more. For Isarsoft, every camera counts — in retail, at airports, in public transit, in urban planning, in logistics, and in cultural institutions.



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