

Press-Release

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The FineArts3D project will enable autonomous, contactless 3D digitization for large-format and fragile masterpieces.

Verus Digital is collaborating with Fraunhofer IGD to develop a globally unique system for the autonomous 3D digitization of paintings.

Large-format, fragile, or permanently installed paintings pose immense challenges for museums worldwide when it comes to 3D digitization. With the “FineArts3D” project, Verus Digital GmbH and Fraunhofer IGD are currently developing a globally unique, autonomously operating 3D digitization system that captures even the most complex works of art contact-free, color-calibrated, and with high precision.

FineArts3D is based on the world's first autonomous high-end digitization system, “CultArm3D,” which was developed from many years of research at Fraunhofer IGD and brought to market in collaboration with Verus Digital.

Since conventional scanners cannot reach these objects or even require manual, risky recording, the joint project FineArts3D aims to remedy this situation. The aim is to enable quality-assured 3D digitization precisely where previous systems have reached their technical or conservation limitations.

The state of Hesse is supporting this technological advancement with around half a million euros as part of a research funding program unique in Germany called LOEWE Funding Line 3. The grant agreement for FineArts3D, presented by Hesse's Minister of Science Timon Gremmels, went to the consortium consisting of Fraunhofer IGD and Verus Digital, led by Verus Digital GmbH from Darmstadt.

"With FineArts3D, we are expanding our autonomous 3D digitization system specifically for particularly challenging works of art such as large-format and immovable paintings. Our goal is to offer museums worldwide a safe, efficient, and high-quality option for digitizing their collections—without conservation risks and without time-consuming post-processing," explained Matevz Domajnko, Managing Director of Verus Digital GmbH, during the official handover of the grant agreement.

The consortium is now consistently developing FineArts3D further with financial support from the Hessian Ministry of Science and Research, Art, and Culture, adding the following key technological innovations:

Key technological advances are

- **Photometric stereo** for reconstructing microscopic surface structures (cracks, impasto, wood grain, retouching)
- **Multispectral imaging** for analyzing pigments, restoration work, and aging processes
- **Colour-calibrated, high-precision images** in accordance with international standards
- **Fully automated scanning process** that generates high-quality 3D models without manual post-processing
- **Non-contact and conservation-friendly recording** to eliminate risks to sensitive cultural assets

The FineArts3D project thus achieves a previously unavailable combination of detail accuracy, speed, surface precision, and digital color stability.

Dr. Matthias Unbescheiden, Director of Fraunhofer IGD, adds, "FineArts3D impressively demonstrates how applied research can be directly translated into practical solutions. Using state-of-the-art 3D capture and multispectral analysis techniques, we can offer museums unprecedented accuracy in digitization while ensuring that the originals are treated with the utmost care. Close collaboration with Verus Digital makes it possible to take digital cultural heritage documentation to a whole new level."

At the handover ceremony, Minister of Science **Timon Gremmels** emphasized: "With FineArts3D, we are supporting a project that combines cutting-edge technological research with the protection and accessibility of our cultural heritage. The combination of autonomous 3D digitization and innovative imaging techniques demonstrates the capabilities of Hesse as a centre of knowledge and innovation. It is precisely this type of cooperation between science and industry that is the focus of the LOEWE funding line 3."

In addition, researchers in Darmstadt can draw on strong partnerships that support technology transfer. The Hessian State Museum in Darmstadt and the UNESCO World Heritage Site Mathildenhöhe are providing works for test scans. Furthermore, leading international institutions are supporting the project in an advisory capacity, such as the Museum of Modern Art (MoMA) in New York, the Los Angeles County Museum of Art (LACMA), and other internationally renowned institutions and research facilities.

This means that global museum requirements are directly incorporated into technological development—for practical requirements and results.