PERCEIVE aims to enhance the digital capabilities of scientists and cultural institutions through a service-based AI toolkit and new design theories for VR/AR/MR experiences, focusing on "Care," "Accessibility," and "Authenticity."

Scanario 2

PAINTINGS & WORKS ON PAPER

This scenario tackles colour changes in paintings and works on paper, such as **fading** and **darkening**, on artworks that need special attention for long term preservation. PERCEIVE aims to develop **predictive systems using AI to simulate these changes**, helping visitors imagine how colours originally appeared and promoting understanding of care and authenticity in preservation.

Scan the QR Code and learn more!

# PERCEIVE
TOOLS & SERVICES

SCENARIO 2 / CHANGE OF COLOURS IN PAINTINGS AND WORKS ON PAPER

COLOUR KNOWLEDGE REPOSITORY

Marios Pitikakis, Sophia Sotiropoulou (FORTH)

The PERCEIVE Colour Knowledge Repository is an **open data management system** designed to **collect, structure, and openly share colour-related resources** in cultural heritage artworks.

From ancient polychrome sculptures to fragile painted surfaces, dyed textiles, and historical films, the repository enables users to **share documentation** and **simulation data on colour changes**, as well as data supporting the assessment of deterioration risks. It also supports sharing of protocols and workflows for preserving coloured collections and protecting them from further deterioration.
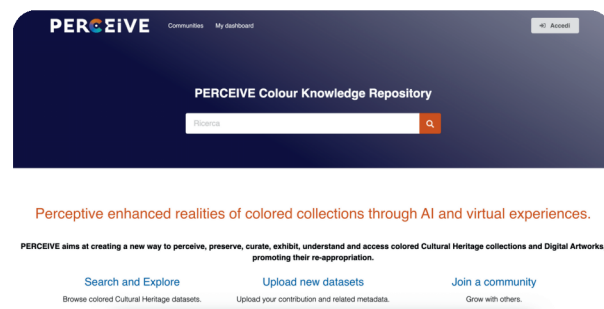

Designed for **collaborative research**, the repository brings together colour experts, scientists, museum curators, conservators, exhibition designers and education and communication professionals, working across physical and digital cultural heritage.

MULAX

Bruno Fanini, Marcello Massidda, Daniele Ferdani, Federica Bonifazi, Donata Magrini, Roberta Iannaccone, Cristiana Barandoni (CNR ISPC)

MuLaX is an innovative **Web3D tool** developed within the PERCEIVE project, enabling experts and the public to explore and analyse cultural heritage artefacts interactively. It allows to visualise **3D models** enriched with **analytical data from archaeometric surveys**, uncovering the details of the remaining ancient polychromy on the marble.
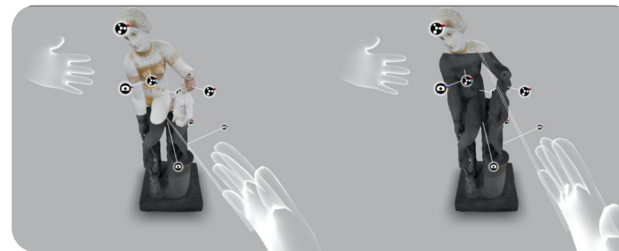
Built on the open-source **ATON framework**, MuLaX supports interactive discovery of analytical analyses, through an **annotation system for spot analyses** (e.g., microscopy, XRF and FORS), and **multi-layer visualisation** for imaging techniques like VIL and UVL. MuLaX also integrates **dynamic image-based masks**, enabling efficient annotation and semantic painting.

Through its connection with the PERCEIVE cloud, it facilitates remote data management and processing, enhancing collaboration among researchers. Additionally, WebXR support provides **immersive experiences**.

LIGHT DAMAGE ESTIMATOR

Panayiotis Siozos, Petros Stavroulakis, Sophia Sotiropoulou (FORTH), Irina-Mihaela Ciortan (NTNU), Gautier Rollin (IMKI)

The Light Damage Estimator (LDE) is a smart, user-friendly tool developed for researchers and museum professionals working with **light-sensitive artworks**. It helps estimate, predict, and simulate how objects might **change over time** when exposed to specific lighting conditions. By combining the spectral profile of a light source with known fading behaviours of pigments and materials, the LDE offers risk assessments tailored to each object. Whether paintings, textiles, or other coloured materials, the tool supports **informed decision-making** by helping define safe exposure limits and simulate visual outcomes. Its goal is to **balance preservation and presentation**, protecting cultural heritage while still enabling its public display under optimal light.