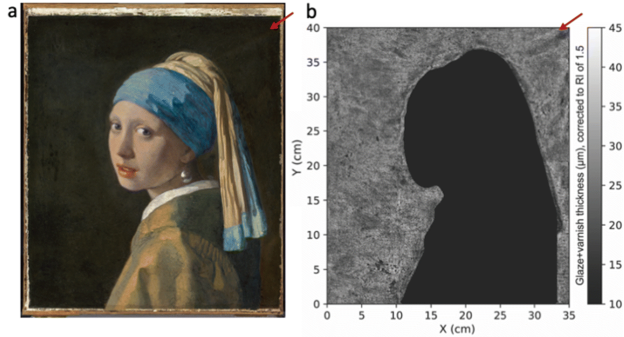


APPLICATION

OCT is a non-destructive, sub-surface, 3D imaging technique that can be used to assess the state of various forms of art, understand past conservation attempts, and plan future restoration efforts.



Vermeer's *Girl with a Pearl Earring*. (a) Polarized light photograph and (b) glaze and varnish layer thickness map extracted from OCT data.^{1,*}

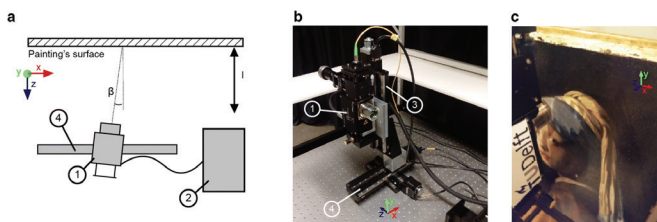
QUICK FACTS

- ◆ OCT is a non-destructive technique to image the layered or coated structure of various samples.
- ◆ OCT is well suited to examine the varnish and glaze layers of paintings; however, its penetration into paint is strongly dependent on the scattering properties.
- ◆ Cross Polarization can be used to reduce artifacts from strong surface reflections.
- ◆ The OCT scanner can be mounted on a gantry system to image small paintings or sections of larger paintings.²
- ◆ OCT has been used to examine cracks and bubbles in jade, varnish, and paint layers in ancient artifacts like Egyptian coffins, and varnish on ceramics.^{3,4}

TYPICAL SETUP

Smaller samples can be placed right under the scanner of the OCT system.

For imaging whole works of art, an automated control gantry system can be employed:²



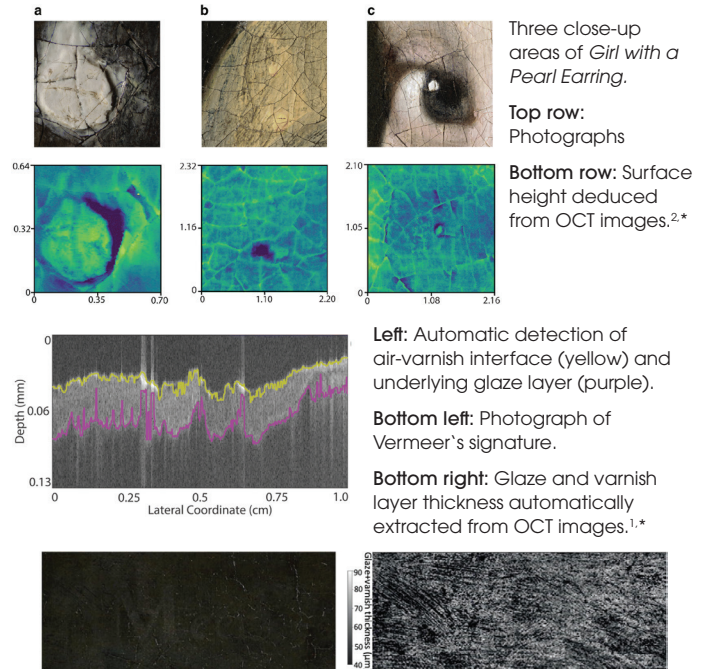
Automatic scanning of *Girl with a Pearl Earring*. (a) Sketch of setup, (b) photograph of scanner on gantry system, and (c) OCT system scanning the painting.^{2,*}

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- 4) C.L. Koch Dandolo, L. Brunel-Duverger, D. Giovannacci, R. Pillay, M. Lopez, X. Bai, S. Pagès-Camagna, N. Brodie-Linder, M. Menu, V. Detalle, *Proc. SPIE 11058, Optics for Arts, Architecture, and Archaeology VII*, 1105817, 2019
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Image adapted from Original.

EXAMPLE IMAGES



Three close-up areas of *Girl with a Pearl Earring*.
Top row: Photographs
Bottom row: Surface height deduced from OCT images.^{2,*}

Left: Automatic detection of air-varnish interface (yellow) and underlying glaze layer (purple).
Bottom left: Photograph of Vermeer's signature.
Bottom right: Glaze and varnish layer thickness automatically extracted from OCT images.^{1,*}

RECOMMENDED ITEMS

Choice of OCT System:

- ◆ **GAN332C1(/M) or GAN632C1(/M):**
For Most Applications
 - High-Resolution imaging at 880 nm
- ◆ **TEL221C1(/M):** For Ceramics
 - Deeper Penetration into Material at 1300 nm



Useful Accessories:

- ◆ Thorlabs' OCTP series scanners are alternative scanners on Thorlabs' 30 mm cage system. These scanners can be adapted by the user, e.g. to accommodate beams of other imaging modalities or to implement cross polarization.