Qunxi Zhang Associate professor, He has worked in Shaanxi History Museum, Xi'an, China.

His research interests include scientific research and non-destructive analysis on ancient mural paintings, preventive conservation of collections, conservation & restoration of ancient objects. He has published more than 30 papers.

Lecture: Application of Optical Imaging Techniques in the conservation for Ancient Mural

Ancient mural is important human cultural heritage. Xi'an and along silk road, where has a large number of mural remains. Mural painting was one of the highest forms of art of the time, reflecting the material culture, artistic pursuits, science and technology and other aspects of the society.

Optical imaging techniques, because of the non-invasive, non-destructive and fast, large-scale murals reveal a variety of materials and implicit information, has been widely applied to the condition investigation and diagnosis of disease in the ancient murals . Optical imaging methods are commonly used: is photographic imaging, grazing light photography, microscopic imaging, multi / hyperspectral imaging, UV fluorescence imaging, infrared reflectance imaging, infrared thermal imaging, X-ray imaging. Based on the understanding of material properties, through imaging methods can be efficient for large-scale murals for Survey and disease diagnosis, according to a variety of information revealed to guide the local point of in-situ non-destructive or microdestructive analysis, various analysis diagnostic methods complement each other and cross-validation. It Can achieve a comprehensive survey of the mural and reveal the disease. Depending on the spectral characteristics of the interaction of the material through different imaging technology that enables information on the mural surface and internal diagnostics and research, not only can reveal hidden information, but also the identification of the material, but also on the mural for the disease diagnostic records. We use multi-spectral imaging diagnostic survey of the Tang Tombs murals, mural reveals not only the two-dimensional information, but also to paint murals for the qualitative inference. Paintings using infrared imaging technology to reveal hidden for draft line; by UV fluorescence imaging reveals the mural area of restoration and materials. Three-dimensional laser scanning technology not only records the murals of spatial data, more accurate and intuitive for the emergence of the deformation, detachment, and disruption and other diseases for diagnostic. Alternatively, the optical coherence tomography (OCT), terahertz imaging and other diagnostic and applied scientific research in Tomb Murals.

High definition digital scanning technology can provide not only high-resolution digital images but also multi-band imaging and surface texture information.

This paper describes the various optical imaging applications in wall painting's conservation, while focusing on potential applications of high definition digital scanning technology.

Key words: optical imaging, high-resolution digital scanning, ancient frescoes.