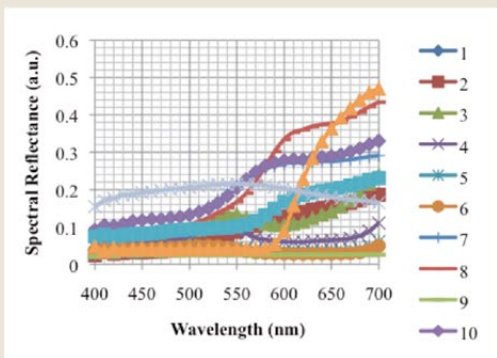


Scientific Recording of Cultural Assets



Located in Kyoto, the city of culture, art and technology, at the Ide Laboratory of the Graduate School of Engineering, we have developed state-of-the-art imaging technologies for scientifically recording numerous cultural heritages in Kyoto and around the globe. Our high precision scanner system for cultural assets digitizes large artworks such as Japanese screens (*byōbu*), wall paintings, precious old design maps of important historical buildings, and world heritage industrial design plans. It is distinct in its high dimensional and color reproduction accuracy, being one order of magnitude higher than commercial imaging systems. The digitization process has been carefully developed to minimize its intrusive effects by developing appropriate light sources. We have also been successful in adding analytical imaging features which enable non-destructive and non-invasive analysis of material composition and color.

The reproduction of the painting on the front page of this booklet is from a scene on a pair of folded screens in the Sumitomo collection (in the Sen-oku Hakukokan Museum) showing the visit of the Emperor to Nijo Castle in 1626, and the life of the citizens and visitors from places around Japan. More than 4500 characters are painted in detail to demonstrate and record one of the biggest parades of the time. The *byōbu* is estimated to be more than 350 years old, and its extremely well preserved golden paintings are a rare historical data source for pigments, clothes, building designs, and the life style of the people and nobles of the era.



Using analytical imaging, it is possible to extract material information from the images scanned by the high-resolution scanning system designed and developed at Kyoto University. A unique mathematical model was created to estimate spectral information from colorimetric data. Thirteen distinct points representing different pigments used in painting the big folding screens (*byōbu*) from Sen-Oku Museum have been selected. The spectral reflectances of these points were reconstructed and compared to a database of Japanese pigments. Since spectral reflectance is a material property, it is possible to estimate the material used in creating the respective colors found on the folding screens. This approach is a non-invasive and non-destructive way of analyzing precious cultural heritage.

In 2012, we collaborated with several national and international institutes to scientifically record important cultural heritages, including UNESCO-designated world cultural heritages, and to digitize on-site and record them in microscopic detail. The database of pigments and colorants from this project will hopefully be a milestone in our understanding of the art and technology of the early Edo period. We carried out projects in China (Beijing, Hong Kong), the UK (Belfast), Italy (Padova, Torino), Korea (Seoul), Egypt (Giza), and the Philippines (Manila) as well as at more than ten sites in Japan to establish a global network of collaboration to preserve, utilize and pass down the world's cultural resources to the next generation. We hope that this technology from Kyoto will act as a catalyst in encouraging a renewed global discussion and interest in culture.



KYOTO UNIVERSITY

Yoshida-Honmachi, Sakyo-ku, Kyoto 606-8501 JAPAN

Tel: +81-75-753-2047 Fax: +81-75-753-2042

<http://www.kyoto-u.ac.jp/>

