A Hyperspectral Dataset of Layered Paintings

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HSI enables noninvasive analysis of cultural-heritage objects, such as paintings, and supports conservation and authentication work. However, openly available HS datasets of paintings remain limited. We aim to release a new HS dataset of six paintings, three of which include intentionally overpainted areas using different styles and paint mixtures (see Fig. 1). For these works, we documented the applied paints, mixing ratios, and application areas. In addition to documenting the ground truth for the overpaintings, each painting was imaged both before and after the overpainting process, providing clean reference images of the underlying layer. This controlled setup enables testing methods for tasks such as unmixing or recovering subsurface features.

Three different hyperspectral imagers were used: Specim's IQ, FX10, and FX17. The IQ is a standalone spectral imager covering the 400–1000 nm range, with a spatial resolution of 512×512 pixels. The FX10 and FX17 operate in line-scan mode, with the FX10 capturing the VIS–NIR range (400–1000 nm) and the FX17 covering the NIR region (900–1700 nm). Their spatial resolutions are 1024 pixels (FX10) and 640 pixels (FX17). The data will be published via the Spectral Imaging Laboratory JYU Zenodo community.



Figure 1: Left: the painting before overpainting. Right: after overpainting. The work was imaged in both stages, and the paints and their mixing ratios used in each grid section are documented, giving comprehensive ground truth information.