

Archiving the Treasures of Humanity with the Latest Digital Technology
Creating New Value for Cultural Properties for Future Generations

MoCoSS

Motion Control Scanning System for Ultra High Resolution Camera

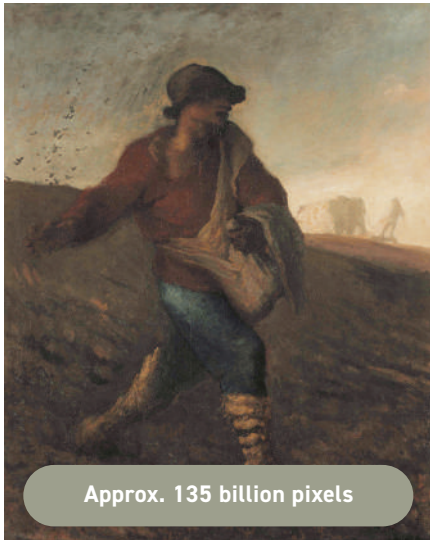


Portrait of Pauline-Virginie Ono
(Yamanashi Prefectural Museum of Art)

Motion Control Scanning System for Ultra High Resolution Camera (MoCoSS) is the collective name for a production tool that digitizes artwork and cultural assets – including paintings, sculptures, and crafts – in ultra-high-resolution 3D to create new visual experiences. Developed by NEP, MoCoSS is capable of handling a wide variety of subjects and shooting conditions thanks to its high level of technology and advanced features. It can scan artwork such as oil paintings as well as three-dimensional objects such as statues and pottery. Our goal is to preserve cultural properties and works of art by archiving them in digital data of the highest quality, and to ensure that these treasures of humanity can be passed on to future generations for many years to come. NEP plans to use the digital data obtained by MoCoSS for the protection and restoration of cultural properties as well as to help museums and art galleries maximize the appeal of their collections and create new value by displaying them as digital assets at virtual museums and various locations in the metaverse.

Unparalleled ultra-high resolution using MoCoSS

Conventional art scanners have a resolution of 400 dpi to 2,000 dpi. MoCoSS uses an ultra-high resolution camera, PHASEONE iXH 150MP, which is specialized in photographing cultural properties and can shoot at a resolution of 8,000 dpi, i.e. 8,000 dots (pixels) per inch square. We take several hundred divided images for a single painting. Each piece is overlapped to enable the extraction of only the central part to avoid any distortion. These images are then woven together using digital stitching technology to create images with a huge pixel count, as can be seen below. Most experts agree that the smallest object the human eye can recognize is 0.1mm to 0.2mm, and the data obtained by the use of MoCoSS would contain detailed information surpassing our eyes' recognition by 40 to 80 times. This enables people to record, reproduce, and allow observation of so-called *matière*: brushwork details, bumps and dips on the surface of paintings in micro units.



The Sower
(Yamanashi Prefectural Museum of Art)
99.7cm × 80.0cm



Summer, The Gleaners
(Yamanashi Prefectural Museum of Art)
38.3cm × 29.3cm



The Return of the Flock
(Yamanashi Prefectural Museum of Art)
53.5cm × 71.0cm



Motion Control Part

Recordable (movable) range	Width	84cm
	Length	84cm
	Depth	49cm
	Movement accuracy	0.01mm
	Movement speed	10cm/Sec.

Camera Part

Resolution	150 million pixels 120mm + Extension ring 21mm + 42mm
Shortest distance	48.8cm from the sensor surface
Magnification	1:1.2
Recording range	64×49mm (W×H)
Resolution capability	0.0045 mm/pixel (The number of pixels in the lateral direction in 150MP is 14204)

Examples of Usage

Digital Archives

MoCoSS can help preserve cultural properties for future generations by saving them as ultra-high resolution digital data, which can then be used as a reference for later restoration and reconstruction work.

New Ways of Appreciating Art in Museums of the Future

- **Experience-Based Aerial Image Content**

Since MoCoSS data is in ultra-high resolution, the high quality of the image can be maintained even when projected on large screens. Viewing them at immersive museums, which are growing in popularity, can create new and captivating visual experiences.

- **Deployment in XR Such as VR and MR**

MoCoSS can be utilized in projects to enjoy artwork in new styles with XR such as VR and MR. The ultra-high resolution data makes a wide variety of experiences possible, from being immersed inside artwork to viewing pieces from any angle.

- **Interacting with Art**

Ultra-high resolution data can be output to a 3D printer to create ultra-high definition replicas. This can be used as supplementary materials in museums, teaching materials in workshops, and for traveling exhibits in educational settings.

Creating New Value for Collections

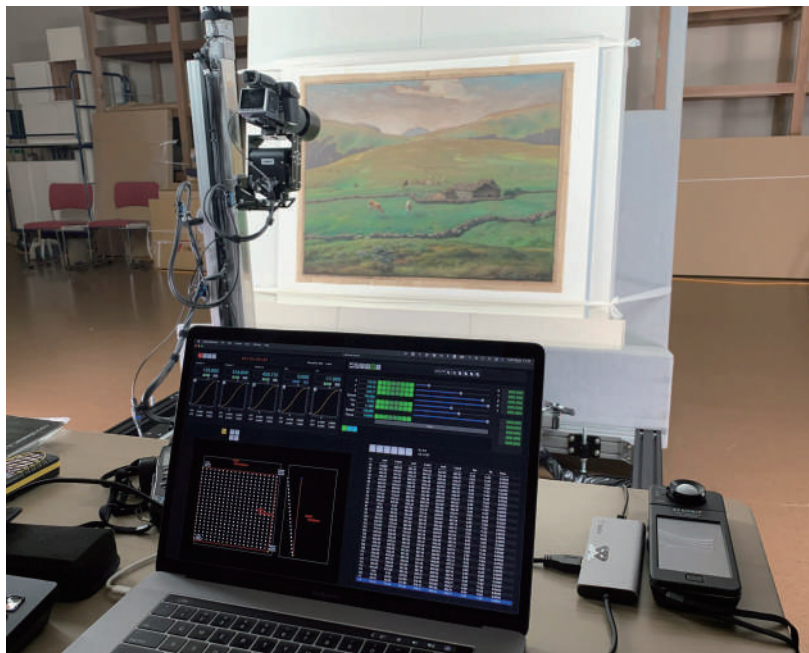
The ultra-high definition, unparalleled accuracy of digital data provided by MoCoSS can be used for digital content services as a secondary form of use for collection items.



*Example of usage, for illustrative purposes.

Achievements to Date

Digital photography services for works in Yamanashi Prefectural Museum of Art's collection



Pasturage among the Mountains of the Vosges
(Yamanashi Prefectural Museum of Art)



Portrait of Pauline-Virginie Ono
(Yamanashi Prefectural Museum of Art)

Production of 3DCG model of National Treasure Tea Bowl (Yuteki Tenmoku), stoneware with oil spot pattern and iridescent luster on tenmoku glaze, owned by The Museum of Oriental Ceramics, Osaka



3DCG model of National Treasure Tea Bowl (Yuteki Tenmoku)

