ViewPaint (Vol.1 *The Milkmaid* by Johannes Vermeer)

Kota Okukubo, Katsuhito Yagi,
Koichi Yoshino, Takafumi Watanabe,
Megumu Machida, Akira Hizawa
TOPPAN PRINTING CO., LTD.
TOKYO, JAPAN

Eiichi Nagai
Prometech Software, Inc.
TOKYO, JAPAN

Yoriko Kobayashi-Sato
Mejiro University
TOKYO, JAPAN

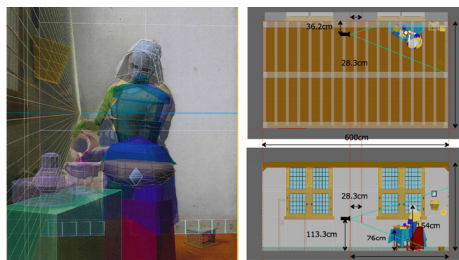**Figure1.** *Milkmaid on the ViewPaint.*

Figure2. *Data to reconstruct the room of Milkmaid in 3D space.*

(a)　　　　　　　　(b)

Figure3. *Viewing the milkmaid from the right side*(a)*, and from above*(b)

1. Introduction

ViewPaint is a viewing system for paintings. This system was produced to propose a new exhibition method using digital technology to art museums. In developing this system, we have tried to realize the idea that if viewers can explore a painting converted into a three-dimensional space, it is possible to foster understanding and imagination, with viewers considering why artists chose certain compositions, what motifs are depicted, and what the background to the period was.

ViewPaint enables a painting originally on a flat surface to be experienced as a three-dimensional space. This system shows representations of assets produced based on archives of paintings without losing the unique style of the artist. In addition, the generated CG images are rendered and displayed in real-time in response to the movement of the viewer detected by a sensor, and viewers can see elements of paintings in an interactive manner, seemingly going inside the paintings themselves.

The first piece to which we have applied ViewPaint is *The Milkmaid* by Johannes Vermeer, a Dutch master of 17th century (Figure 1). We call it ViewPaint vol.I.

2. Our Approach

2.1. *The Milkmaid* converted into a three-dimensional space

The room depicted in *The Milkmaid* has been converted into a three dimensional space. To execute the operation, we have traced back the assumed applying process of geometrical perspective used by Vermeer, referred to various contemporary Dutch genre paintings, furniture and architectural details, and to the standard size of a piece of Delft tile of the time (13x13cm), which offers us to infer the sizes of each represented detail. Numerous CG simulations also help us greatly [1], [2], [3] (Figure 2).

2.2. Vermeer's style is preserved regardless of the viewing angle

Due to the development of an original real-time CG rendering program, whatever angle the space is viewed from, the monitor always displays CG images that seem as if they were painted by Vermeer (Figure 3).

2.3. An interactive experience in which you go beyond the frame.

By combining the 3D space of the painting with a sensor that detects a person, the CG image is displayed in response to the movement of the viewer standing in front of the device. This means that the viewer can have an interactive experience and feel as if they were beyond the frame and actually visited the room painted by Vermeer.

3. Conclusions

By offering the viewer an interactive virtual experience to be inside the painted space, ViewPaint will arouses the viewer's interest in appreciating the painting. It is planned to add a function to our system to provide the viewer with information about the painting technique of the artist and the subject of the painting (Figure 4). We also expect to produce ViewPaint images of the other Vermeer's works and to contribute to make painting and composing techniques of Vermeer clear.

Figure4. *Demonstration Exhibited at Fukuoka Asian Art Museum. (March 2012)*

References

[1] Yoriko Kobayashi-Sato, *The Milkmaid: The birth of the painter Vermeer*, Tokyo, 2007

[2] Philip Steadman, *Vermeer's Camera,* Oxford, 2001

[3] A. Criminisi, *Visual Metrology from Single and Multiple Uncalibrated Images,* Oxford, 1999