

# Sumi-Nagashi

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## Abstract

“Sumi-Nagashi” is an original and traditional Japanese art, similar to “marbling.” Attendees will experience the streaming picturesque installation of “Sumi-Nagashi” literally and physically by using a newly developed desk-style force feedback device, “Proactive Desk.” Dynamic visual and haptic changes of colors and shapes will arouse new inspiration in painters.

## 1 Introduction

The digital revolution has also drastically changed the field of art. All artists desire the cutting edge of technology in their tools. So, today’s most modernistic tool for expression is naturally the computer. However, most forms of expression by the present computer technology appeal only to the visual and auditory senses. So, the corporeality of the creator, which is indispensable for creation, is left behind. In this demonstration, we bring tactile sensation, which is impossible to display by other digital tools, to the field of digital art with our advanced force feedback device. We want to search for the possibility of a new style of art that is created through the application of “Sumi-Nagashi.”

## 2 Overview

Guests of this demonstration are able to enjoy creating a fluid, picturesque installation that changes moment by moment through a digital canvas and fixed pen. A kind of field with a virtual stream of flowing colors and physical forces is generated on the canvas. The strengths and directions of the stream are different in each place, in other words, they also depend on the picture of the base. When the user puts a new color in the field, the color is carried away by the nearby colors’ properties, and a new picture is created by mixing with the picture of the base. The user can enjoy the process of creating a picture not only with a visual sensation, such as colors, but also with a tactile sensation, such as the feeling of the drawing through the pen and the hands. Experiences that let the user understand the viscosity of the virtual colors of each painting through the digital pen and feel the texture of the virtual canvas corporeally are the most creative points of this demonstration. This will give painters an opportunity to realize again how important the creativity existing in the sense of touch is for art.

As a digital canvas, we use a “Proactive Desk,” which is a new digital desk with a force feedback function developed by us [Noma et al. 2003]. The Proactive Desk has the shape of a usual desk, and a desktop image of a PC is projected onto it from an overhead projector. The mechanism that produces the forces of the Proactive Desk is completely concealed in the canvas. This means that the user can operate the pen seemingly like operating an ordinary tablet. The Proactive Desk is able to generate the two-dimensional forces required by desktop operation easily without any mechanical link structures, which tend to disturb the projection of the desktop image and the view during tasks. This is the technically innovative point proposed in this demonstration.

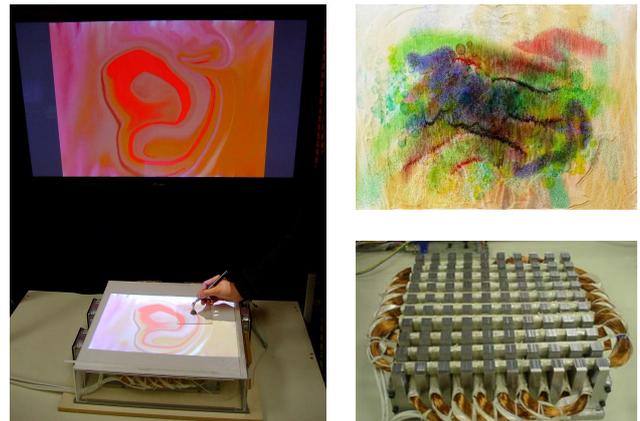
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## 3 Goals

The importance of corporeality in the field of art is well known by all artists. Creators understand it intuitively. An attractive piece of art can be created by deeply understanding and interacting with materials and tools through physical contact, and this is the starting point of creation. However, today’s “Digital Artists” have had to sense those feelings unnaturally using nonexistent tools and virtual materials. This means they have had to accomplish the same creation using only limited human sensations unlike in other classic arts. This may lead you to think that there is a limitation to multi-creativity and no necessity for human nature in the field of digital or media art in comparison with other fields of art. However, it would be hasty to say that there is no future in this field. On the contrary, there is a great potential that we have never experienced hidden in this field. It is only immature.

This demonstration is one of the first steps to adopt corporeality into the digital world. We will show you a new potential for art harmonizing the visual and the haptic.



**Figure 1. Sumi-Nagashi.**

*Left: Scenery of an interaction with the installation. Upper-Right: Image with a virtual stream of flowing colors and physical forces (painted by Jun Kurumisawa). Lower-Right: Core of the Linear Induction Motor to feedback forces to the user.*

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## References

- ZEKI, S. 2000. Inner Vision: An Exploration of Art and the Brain, Oxford University Press, Feb. 2000.
- NOMA, H., YANAGIDA, Y., AND TETSUTANI, N. 2003. Development of a New Force Display System for a Digital Desk Using a 2-DOF Linear Induction Motor, *IEEE VR2003*, Mar. 2003.