# The Introduction of the 5th Exhibition at the col.lab Gallery

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**ABSTRACT**

*Observing is the act of actively approaching an object, and the results of observation vary according to the approach, so it can be thought of as similar to talking with the object. The 5th exhibition, "Talking with Color", held at the col.lab Gallery from Nov 19, 2019 to Apr 25, 2020, is an art exhibit in which viewers can feel as if they are interacting with color, such as by changing it autonomously or according to their behavior or subjectivity.*

## 1. INTRODUCTION

When you look at flames, smoke, or waves as they gradually change in shape, aren't you drawn in and lose your sense of time passing? As your consciousness is entangled in things that change, such as life does, it appears that the objects being looked at have their own subjectivity separate from yours. Observing is the act of actively approaching an object, and the results of observation vary according to the approach, so it can be thought of as a dialogue. The theme of the 5th exhibition at the col.lab Gallery from Nov 19, 2019 to Apr 25, 2020 is "Talking with Color" [1]. This exhibit highlights art that helps viewers feel as if they are interacting with color, such as by changing it autonomously or according to their behavior or subjectivity.

## 2. THE ARTWORKS

### 2.1 The Dress

*Supervising Editor: Yuta Ogai*

The photo of "The Dress" became a hot topic on the Internet because its color appeared either as black/blue or white/gold in photos depending on the viewer. "The Dress" is on display with a system that allows the viewer to change the color of the LED light that illuminates it (Fig.1).

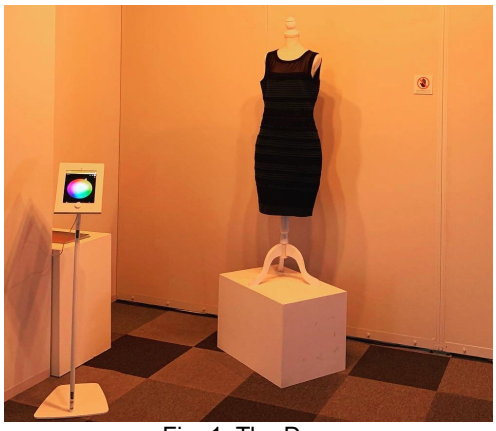

Fig. 1. The Dress

### 2.2 Chaotic Video Feedback

*Author: Yuta Ogai*

If you capture an image on a screen with a camera and display the captured image layered over the original screen image, a repetitive pattern like a coupled mirror emerges. A system using chaos mapping on each camera image to break repeated objects gradually over each loop is on display (Fig.2). The chaos mapping is a logistic map that converts the RGB or HSV value of each pixel to next state. Viewers can interact with the system by stepping into the repetitive screen and adjusting the mapping parameters themselves.

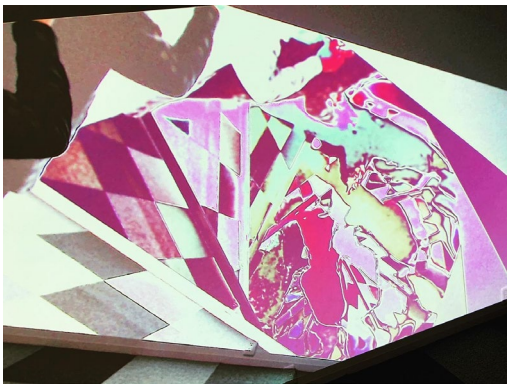

Fig. 2. Chaotic Video Feedback

### 2.3 DanceAI × smart-footwear ORPHE ONE

*Authors: Naoyuki Hirasawa, Daichi Shimizu*

*Support: no new folk studio, Inc.*

DanceAI automatically detects the movements of break dances and feeds back the results using smart-footwear ORPHE ONE. This system incorporates an AI (deep learning) that learns movements in natural environments using shoes with acceleration sensors (Fig.3). It can classify skills and steps and evaluate their proficiency using an application and the LED colors of the shoes.


Fig. 3. DanceAI × smart-footwear ORPHE ONE

### 2.4 Through the Looking-Glass

*Authors: Antoine Pasquali, Corentin Risselin, Daniel Majonica, Javier Fdez, Steven Weigh*
*Support: Cross Compass, Ltd.*
This exhibit lets viewers immerse themselves in bio-inspired deep learning mechanics in a dynamic and interactive way (Fig.4). The AI's task is to apply a multi-style transfer to the video feed in real time as a demonstration of creativity. Each screen acts as a different type of looking-glass. The left screen directly reflects what we see (the video feed) and perceive (convolutional layers) of the real world. The center screen shows the "Latent Space", which is an integration layer for all the signals that contribute to achieving the task – in this case, merging different styles of transfer. For the human brain, this is called "Connectome", a map of the neural wiring between various areas of the cortex. On the right screen, reconstruction layers (deconvolution) operate the multi-style transfer.

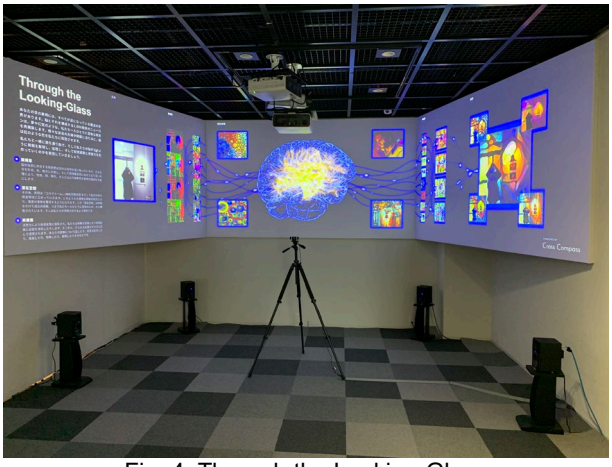

Fig. 4. Through the Looking-Glass

### 2.5 Visualization of Body Information using Color

This exhibit considers the possibility of making hidden information noticeable by visualizing body information using color. The following three works are on display.

#### 2.5.1 Can Cloud AI Read Your Feelings?

*Authors: Yousun Kang, Duk Shin*
When viewers press the button in front of the small monitor (Fig.5, center), the camera on the large monitor sends data to a cloud AI, which recognizes their faces [2]. While the viewers' estimated ages and genders are output on the large monitor, if their emotions can be properly read from their facial expressions, LED lights output a color according to the emotion.

#### 2.5.2 Visualization of Heart Rate with Color

*Author: Takenori Obo*
This system calculates heart rate from data acquired by the air pressure sensor installed on the chair and represents them in color using a LED tape (Fig.5, right).

#### 2.5.3 Color Expression by Pole Movement

*Authors: Keisuke Kojima, Hiroto Akiyama, Kihiro Kawahara, Daiki Tanaka, Masahiko Yamamoto, Masaomi Sanekata, Yuta Ogai*
Accelerometer sensors attached to poles such as Nordic walking poles and bamboo swords measure the movement of the pole. An LED tape on each pole shows the movement by converting the data to a color (Fig.5, left).


Fig.5. Visualization of Body Information using Color

### 3. ASSOCIATED EVENTS

Kenichiro Mogi, a brain scientist, was invited to the opening of this exhibition at the Atsugi Campus of Tokyo Polytechnic University on Nov 30, 2019 to give a talk about the relationship between color and consciousness. In addition, on Dec 19, 2019, Naoaki Fujimoto was invited to present a special lecture on "How to Create Interactive Art". Their informative talks were well-attended and a valuable addition to the exhibition.

### 4. ACKNOWLEDGEMENT

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### 5. REFERENCES

[1] The 5th Exhibition at the col.lab Gallery "Talking with Color", https://www.color.t-kougei.ac.jp/events/events28_21.html. Accessed 28 Feb 2020 (in Japanese).
[2] Yousun Kang, Takenori Obo, Yuta Ogai, Duk Shin, "Real-Time Emotion Estimation System Using Face API of Microsoft Azure", Proceedings of the 2nd International Symposium for Color Science and Art 2020, pp.9-10, 2020.