

Ambient Weaving

II

The Hosoo Gallery is pleased to announce the exhibition *Ambient Weaving II*. Since 2020, Hosoo Co., Ltd. has been working with the Yasuaki Kakehi Laboratory of the University of Tokyo and ZOZO NEXT, Inc. to develop new textiles that are both functional and beautiful, combining traditional craftsmanship and cutting-edge technology. The Hosoo Gallery presented the results of their research in 2021 with the exhibition *Ambient Weaving*. The present exhibition will showcase the developments of the same collaboration, continued over the subsequent two years. The textiles on display make visible the phenomena that occur between humans and their environment including colors and light, perceivable only under specific environmental conditions.

Recently, much attention has been given to the relationship between the environment and technology with the advent of the Anthropocene. Technology has had a significant impact not only within the context of scientific and industrial evolution, but on natural philosophy and cultural systems as well. New technologies play a particularly important role in shaping space. Today, as information space grows ever larger, the definition of the environment is undergoing even more transformations. Indeed, the very concept of nature needs to be redefined.

“Ambient Weaving,” a concept forged in the course of the joint research project, refers to a textile reflecting environmental information, or textile into which the environment itself is woven. Weaving is one of the oldest technologies, believed to have been established more than 10,000 years ago. In ancient times, textiles were created by making threads from

common plants and trees, dyeing and weaving them. It is no overstatement to say that textiles are a medium that envelopes the natural environment in which humans live. At the same time, textiles have served as partitions separating humans from their environment, either as carpets or as spatial enclosures. Unlike walls that completely shut off the environment, textiles sometimes let light and wind in. They can also generate a new environment within the space by triggering color phenomena and tactile experiences. This exhibition will explore the possibility of environment-creating textiles as a logical continuation of the previous iteration of *Ambient Weaving*. This type of textile is made possible by the sophisticated technique of Nishijin, developed over 1,200 years. By weaving cutting-edge materials into the weft, we have realized textiles with functionality that responds to changes in environmental conditions.

The most significant feature of the present show is the juxtaposition of prototypes with the tea room *Ori-An*, an enclosure constructed of a *shōji*-like gauze made of washi paper threads using the traditional Nishijin technique of *sha*. One origin of the tea room is found in the spatial enclosure that served as a place where people could gather. Going back to this beginning, the *Ori-An* aims to reflect on the nature of space by proposing a uniquely contemporary tea ceremony culture, with textiles as the starting point. By showing it with a selection of prototypes, *Ambient Weaving II* seeks to redefine the environment, and ultimately nature itself, while connecting to a variety of cultural backgrounds.

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Wave of Warmth

This fabric can be shaped from a flat sheet into three-dimensional forms and then easily returned to its original flat state. It is woven using two different types of carbon bars as wefts. The ends of these bars can be connected using snap buttons, allowing the textile to transition into three-dimensional forms which were designed through simulations. By altering the order and positioning of connections, it is possible to create multiple shapes using the same textile. The three exhibited shapes represent the stages of a blooming flower (a bud, half-opened and fully-opened) and were made using the same textile design.

Pattern: Wave
Material: Silk, Polyester, Rayon, Washi + Silver, Acrylic, Carbon bar

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WP006 <Iridescence>

The surface and shadow of this textile shows different appearances through the layering of specialized foil materials. By printing a pattern with microstructure-controlled ink on the surface of the film woven as the weft of the textile, it selectively reflects specific wavelengths to create a metallic sheen. Through overlapping multiple films in a particular order and weaving them into the textile, the textile's transmitted light and reflected light from the back side superimpose. This gives rise to color variations and moiré patterns stemming from periodic shifts in the intricate printing pattern.

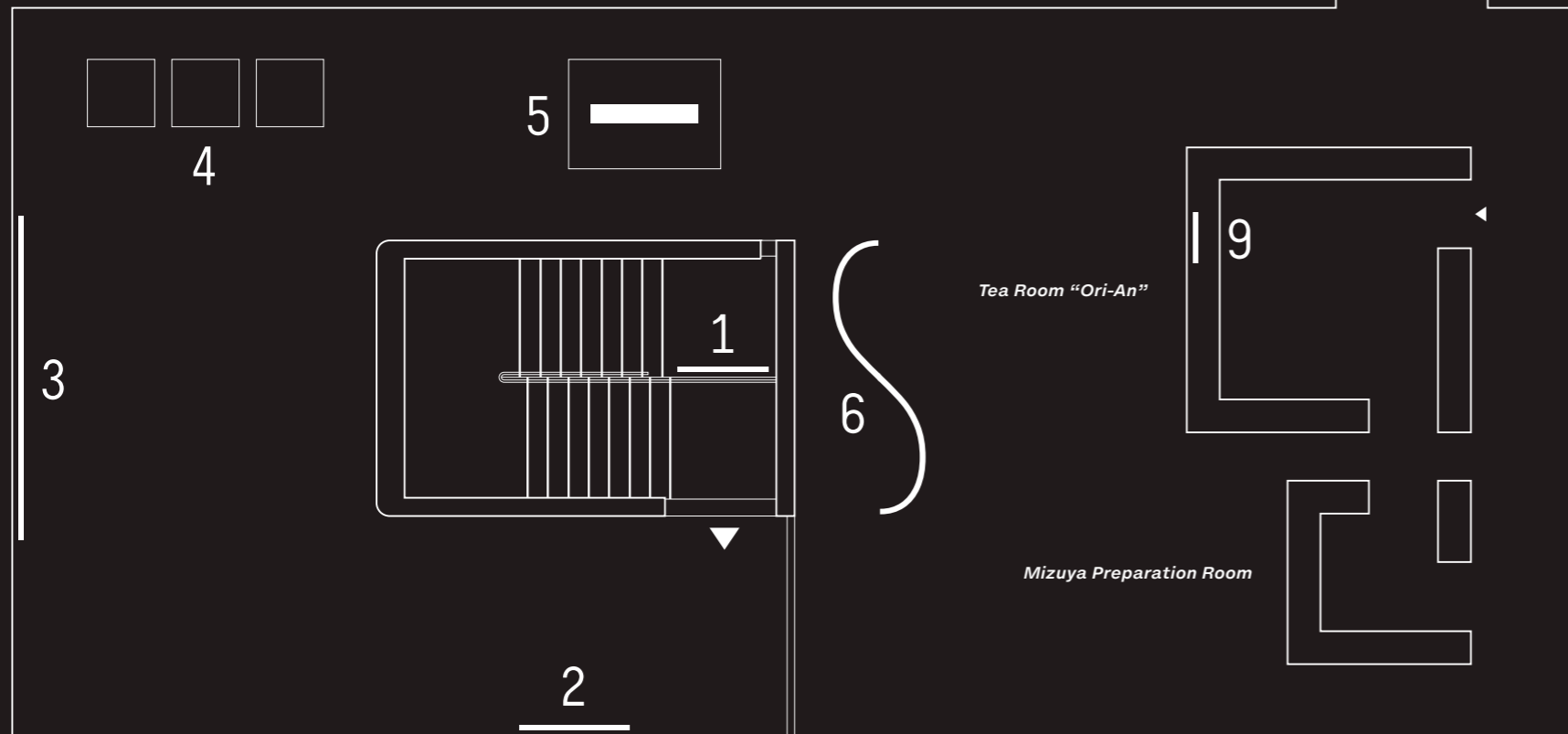
Pattern: Ripple Marks
Material: Silk, Polyester, Rayon, Washi + Silver, Nylon, Structure colored film

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WP003 <Layers>

In this installation, light is shone through two overlapping textiles to reveal color. Foils consisting of polarizers and Oriented Polypropylene (OPP) tape are woven into the textiles. As light traverses through the overlaid textiles, birefringence occurs, causing polarized colors to appear. Despite utilizing the same materials, the textiles exhibit multiple colors by altering the orientation of the polarizers, adjusting the thickness of the tape and arranging the sequence of foils to create a color pattern. The textiles' appearance also dynamically changes depending on the viewed position.

Pattern: Ripple Marks
Material: Silk, Bemberg, Polyester, Washi + Silver, Nylon, Polarizer, OPP tape



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Wave of Warmth

In this work, the color of the fabric changes according to the temperature of the surrounding environment. By coating both sides of Japanese *washi* paper with ink containing leuco pigment that changes color when it reaches a certain temperature, and cutting it, the paper is woven into the weft as foil. When the temperature rises above 25 °C, the color changes from black to blue, and when the temperature drops, the color returns to black. This work visually represents temperature changes through the reversible and real-time color transition of leuco pigments.

Pattern: Wave II
Material: Silk, Polyester, Washi + Silver, Nylon, Leuco laminated thread

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WP002 <Optical Unveil>

The appearance of this textile changes depending on the incident light and the observer's position. Foil threads with retroreflective beads and a thin interference layer are woven into the textile, showing interference colors corresponding to the optical length of the incident light's angle. Thus, the foil threads display a range of colors because of interference colors that change with the angle of incident light. Additionally, the three-dimensional structure of Nishijin produces more intricate interference colors.

Pattern: Wave
Material: Silk, Polyester, Washi + Silver, Nylon, Leuco laminated thread

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Ambient Weaving – Data Visualization

The pattern of this digital textile is based on Hosoo's iconic fabric "Wave" and is generated from environmental information. The graphics on the monitor dynamically change according to a year's worth of environmental data collected surrounding the Hosoo Gallery. The weaving structures of the fabric are included as data in this digital textile, allowing for the physical weaving production of the fabric. The textile featured in the tea room exhibit *Jiku* created using the same data generation method as "Wave."

Pattern: Wave variations

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WP001 <Sounds>

This textile functions as a speaker by weaving in piezoelectric polymer films with electrodes on both sides as foils. The audio-electrical signals exclusively make the weft portions vibrate, causing selective regions to generate sound. Sound dispersion can also be modified based on the textile's form. Moreover, as the textile can let external sounds pass through, this textile can facilitate unconventional sound effects such as superimposing sound from the textile onto environmental sounds.

Pattern: Wave
Material: Silk, Polyester, Cupra, Rayon, Piezoelectric film

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WP007 <Pixels>

This textile emits light in a dot matrix configuration. The organic light emitting diodes (OLED) foils woven into the weft of this textile produce light upon applying an electric current to them. The intersecting points between the OLED and the conductive threads utilized as the warp establish the matrix circuit. As the foils are woven to the back side of the textile, they do not interfere with the Nishijin's design even when the lights are off. Furthermore, it is possible to design flexible textiles in a weaving length that is scalable.

Pattern: Blink
Material: Silk, Polyester, Washi + Silver, Nylon, Organic light-emitting diode (OLED)

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Jiku

This hanging scroll is made of fabric incorporating threads capable of changing from black to pink when the temperature reaches 31°C or higher, as well as unique foil threads that display interference colors through retroreflective properties. The back of the scroll is equipped with a heater, which, when controlled by a computer program, causes the fabric's color to change over time. Additionally, when the incident light and the observer's position are in very close proximity, the foil threads display interference colors. The patterns were generated from an algorithm that incorporates past environmental data. The Japanese term "Jiku" refers to the dimension of time and space alongside the scroll, and it intricately portrays multiple aspects of the evolving environment influenced by changes in time and space surrounding the fabric.

Pattern: Wave variations
Material: Silk, Rayon, Polyester, Polyethylene, Retroreflective yarn, Thermo reactive polyester

Ambient Weaving II

Research and Development: HOSOO Co., Ltd. and Yasuaki Kakehi Laboratory, the University of Tokyo, and ZOZO NEXT, Inc.

Organizers: HOSOO Co., Ltd. and ZOZO NEXT, Inc.

Technical Contribution: NIPPON SHOKUBAI CO., LTD, FUJIFILM Corporation.

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Yasuaki Kakehi Laboratory, the University of Tokyo

Research/Artwork: Yasuaki Kakehi, Yumi Nishihara, Yahui Lyu

Tea Room “Ori-An”

Architect: SUO

Color Direction/Textile Design: Mae Engelgeer

In collaboration with Reijiro Izumi (president, SABIÉ),

Tesera Co., Ltd., and Kumiko Idaka

Research: HOSOO STUDIES Direction: Masataka Hosoo

Dates: October 27 (Fri.), 2023–March 17 (Sun.), 2024

Venue: HOSOO GALLERY (HOSOO FLAGSHIP STORE 2F, 412 Kakimoto-cho Nakagyo-ku Kyoto 604-8173)

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