fuwapica suite

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Figure 1: The fuwapica suite

The fuwapica suite is a set of a round table and air-cushioned chairs. When a user sit on one of the chair, color of the air inside the chair gradually changes from white to a same color of an object the user put on the round table as if the chair itself breezes. Multiple users can sit each chairs; they will find that their own colors are slowly mixed togheter and find fusion of different colors.

1. Introduction — future furniture

Ancient Japanese used to believe that Gods lived not only in nature but also in artifacts. They thought Gods lived in every pairs of chopsticks, every dishes, and every furniture sorounding them. Legend says ancient people used to talk to the Gods inside such commodities and everyday tools as if such stuffs had their souls themselves. Particularly furniture and houses surrounding people had been thought that they were even breezing (breezing is called *ki* in Japanese). Those people thought they had breezed together with furniture and house, they had interacted with those artifacts, and they had interacted each other by communicating to and sharing with those artifacts without words.

That idea of ubiquitousness of Gods is still living in Japan of 21st century. A word *monogatari,* which means story, can be separated into *mono* and *katari (gatari),* which is meaning artifacts *(mono)* tell *(katari)* something to us. You probably would find the same concept of *monogatari* (artifacts tell you something) in Gibson's Affordance theory, which is widely accepted in human interface research. You can think of *ki* (breezing) of artifacts is a sort of ultimate affordance of the artifacts [1-3]. A Japanese media artist Tosa demonstrated such storytelling model in interactive art called ZENetic computer from the viewpoint of Zen concept [4].

The spirit of *monogatari* still lives; however, furniture seems to keep silence nowadays. The authors think that furniture is still wanting to talk to you (and some of us can hear it). The authors think they would be able to give some lost aspects of *monogatari* of furniture once again with modern computer and sensor technologies. They call the furniture that can breeze and talk future-furniture. This naming may be a little bit misreading: remember the furniture is breezing and talking all the time, the reason of the silence should be inspected inside us.

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Figure 2: How fuwapica works (1 of 3)
A user is just sitting down on a chair. A pressure sensor immediately starts up and the system changes the color of illumination. The user would notice that the color of the air inside the cushion itself changes gradually.

Figure 3: How fuwapica works (2 of 3)
The color of the air inside the cushion is gradually changing. The user put some red object on the table so that the color is going to be red. (The red object was removed intentionally to show color-sensor, a tiny dot in this photo, built in the round table.) Display on the surface of the round table is showing that the chair is turning to red.

2. The fuwapica suite

The fuwapica suite (shown in **Figure 1**) is a set of a round table and four air-cushioned chairs. It is designed so that people around the fuwapica suite can interact with it.

When someone sit on one of the chair, color of the air inside the chair gradually changes from white to a same color of an object he/she put on the round table, as if the chair itself breezes color (see **Figures 2 to 4**). Multiple persons can sit each chairs; they will find that their own colors are slowly mixed togheter and find fusion of different colors.

Colors often expresses human's emotion. Users can express their feeling by putting their favorite stuffs, or anything they want to put, and interact with other users (if they want so). When no user attracts the fuwapica suite, it shows breezing softly as if it is sleeping but not dead by gradually changing brightness of chairs. The breezing cycle of the fuwapica suite is adjusted to match human's one in hope that people would feel some warmth of life in it.

3. What is behind the fuwapica suite?

The fuwapica suite consists of the round table with built-in LCD display and air-cushioned chairs. A computer (Apple Macintosh running Mac OS X) is set inside the round table. The table and the chairs are connected via wireless network (see **Figure 5**).

Four color sensors are built in the surface of the round table, scanning color of an object put on the table. The color sensor illuminates the object with red, green, and blue lights in human-invisible frequency (currently 60[Hz]) and detects reflectance of each colors from the object above the sensor. This color sensor is unique one and was first introduced in 2005 as a part of RGBy (pronounce rug-bee, see **Figure 6**), a digital color picker for physical objects, and then expanded to RGBy desk in

Figure 4: How fuwapica works (3 of 3)
The color of the air inside the cushion is now completely turned into red. The red color of the chair is slowly moving to the next chair.

2006 (see **Figure 7**) by the authors [5].

The gas-pressure sensors built in the chairs measure pressures inside the air cushions and send that information to the table unit. The table unit calculates brightness of the color to give back to each chair by composing hue from the color sensor and value (brightness of color) from pressure values. In this process, four colors are mixed for showing existence of user-user interactions. The result color is rendered on the round display embedded to the desk and the chairs.

4. Concluding remarks

The authors introduced interactive furniture, the fuwapica suite. The fuwapica suite is designed to accept and react to emotions of people around the furniture by acquiring and expressing colors they give to it.

From the authors' experiences of showing the RGBy and the RGBy desk as interactive furniture at more than dozen of exhibitions, the authors are able to proudly say that the RGBy and the RGBy desk are not only funny furniture, but also playful, delightful, and meaningful, pieces of interactive art we have never seen before. The fuwapica suite, which is brand new to the world, is more than its successor.

The fuwapica suite will tell you that every furniture has their *monogatari* (story), and it really can talk to you.

References

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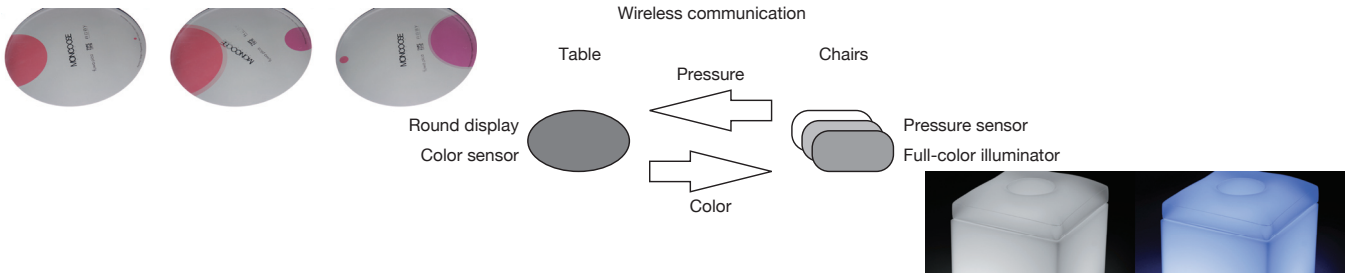

Figure 5: System overview
The round table and the chairs are connected via wireless network. The color sensor built in the surface of the round table scans color of an object put on the table. The pressure sensors built in the chairs measure gas pressures of the air inside the air cushions and send that information to the table unit. The table unit calculates brightness of the color to give back to each chair by composing hue from the color sensor and value (brightness of color) from pressure values. In this process, four colors are mixed for showing existence of user-user interactions. The result color is rendered on the round display embedded to the desk and the chairs.

Figure 6: The RGBy (2005)

The RGBy (pronouce rug-bee) is a one-pixel digital camera sized with 4-inch height and 4-inch diameter. It copies color of a stuff on which the RGBy put. Copied color are able to transfered to any computer devices via wireless networks. Users can draw pictures with those colors by using any painting software like Adobe Photoshop; this means the users no longer need hard-to-use color pickers of painting softwares. The color sensor units of fuwapica suite inherited the concept of the RGBy.

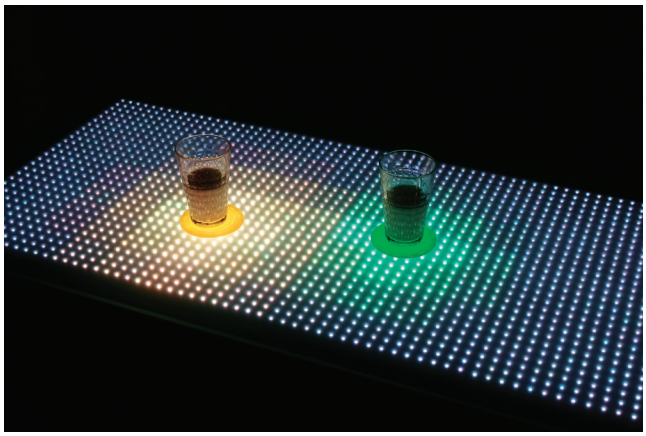

Figure 7: The RGBy desk (2006) [5]

The RGBy desk (pronouce rug-bee desk) illuminates with the same color and the same shape of the things users put on it. As sometimes color expresses emotion, users can leave their emotional messages on the desk by putting their stuffs and then remove that stuffs. Users can also input color value directly into the computer drawing applications by using RGBy desk, but not giving boring Red-Green-Blue value to the computer.