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# Enhanced Tradition – Combining Tech and Traditional Clothing



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## Abstract

We present the concept of the "Enhanced Tradition", combining electronics with traditional Japanese clothes; our initial prototype integrates a smart phone display in an obi (traditional sash). We overcome the common problem of where to put the phone while wearing Kimono and Yukata and create a new flexible, interaction surface. We present a user study evaluating our first design and exploring the application design space for using the "Enhanced Obi" to augment the user. The application ideas from users range from displaying past or current events to communicating the mental state to bystanders.

## Author Keywords

Enhanced Tradition; Obi; Japan; Mobile Phone

## ACM Classification Keywords

H.5 [Information interfaces and presentation (e.g., HCI)]:  
H.5.2 User Interfaces, Interaction Style.

## Introduction

With further technological enhancements and accelerating globalization, there is the fear of losing cultural identity and diversity [6]. Commodity culture tends towards themes of anonymous products, blurring sense of origin or uniqueness, eliminating the presence of traditional crafts. However, a



**Figure 1:** Usual method to carry a mobile phone while wearing Japanese traditional clothes (Yukata and Obi).

countries history and tradition doesn't only shape the past and history of the country but is an important key to its development in the future. In our research agenda, we want to combine traditional arts and crafts aesthetics within modern design techniques to preserve tradition and maintaining diversity in culture, craft, arts while envisioning new augmentation/interaction techniques.

Close to our research agenda, Uriu et al. explore how to combine technology with religious traditional artifacts used to commemorate the dead.[2]. Berzowska et al. are on the other side of the spectrum pushing the boundaries of electronic textiles[1]. We are not aware of any work that uses the smartphone as integrated piece of clothing for display or interaction. There is also a lot of work in on-body worn displays and novel textile displays[4, 5]. We see this work as complementary to ours. For example, we want to extend the smart phone display on the Obi for future work.

In this paper, we state our progress in combining the traditional design of a Japanese artifact – an Obi, a sash for traditional Japanese dress – with wearable technology. For the first prototype we focused on a smart phone.

### Approach

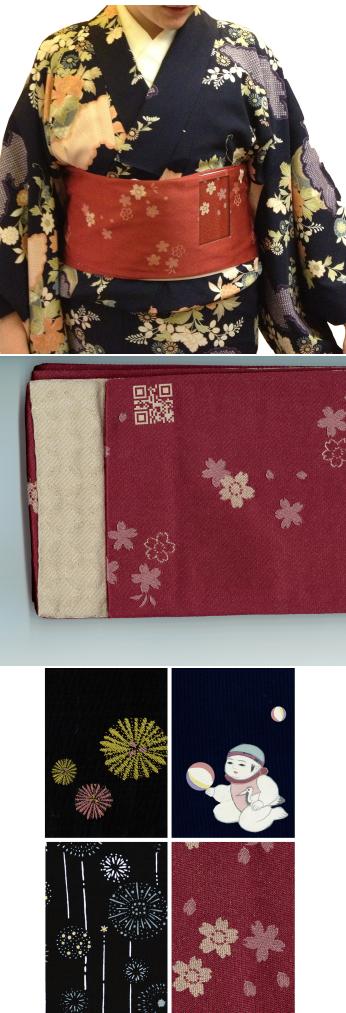
The aesthetic sensibility and culture of Japan may be attributed to the discipline of Zen Buddhism and Shinto. For centuries The Japanese have dedicated themselves to celebrate the beauty of nature and the changing of seasons. This can be seen in many forms of Japanese art and cultural events. One of the most identified artifacts tied with the Japanese culture is the kimono and obi [3]. Nowadays the kimono is worn in rare occasions and most wear a yukata. The yukata and the kimono are worn in traditional seasonal event such as festivals, public events, celebrations, and formal and unformed events and their design such as pattern,

color etc are strongly influenced by the seasonal motif of the time.

There are about five different obi types that change by shape such as changing the width from narrow to wide, all narrow or all wide and also different lengths[3]. The characteristic of the shape of the obi determines to when and where it will be used. For example the maru obi will be usually used in formal events such as weddings and funerals. The hanhabé obi for example is much more common and can be used in daily life, festivals and in formal events depending to the pattern and fabric design. The type of obi also determines the obi knots. Nowadays the most common and known knot for woman is the chocho musubi. In conclusion to this study and experiments, we decided to use a hanhabé obi for our main prototype.

### Prototypes

By designing a new obi that has a designated place for the mobile phone this will not only solve a physical problem of where to carry the mobile while wearing an obi but also creates an opportunity for a new design experience as for the user and for the viewers, see Fig. 1. The new obi that we have designed will have a designated pocket to hold the mobile phone; the pocket allows the display of the mobile phones screen through the obi toward the viewers. By using a QR code application the user can download the matching animation for that obi. The phone will display an animation that will match the pattern of the obi. The animation will not only be a vivid and dynamic part of the obi but will be an interaction tool. The prototype is currently made from re-using existing obi. The material for the pocket is polymer clay that hardens in the air and create a hard inner pocket to protect the phone, this has proven to work well. The outer display panel is from 3mm silicon sheet (see Figure 2).



**Figure 2:** Initial prototype pictures. From top to bottom: one of the prototype obis's with the mobile phone in the pocket. The QR code on the Obi to download the correct application. The initial 4 animation designs for the Obis.



**Figure 3:** Trying different display panel covers, left the acrylic glass we ended up using.

After the initial 4 obi designs, we investigated different materials for the outer display panel, see Fig. 3. From initial user feedback some see through paper seemed appropriate as it's a more natural material. However, trying several papers, we ended up using acrylic glass as it seems the best to use for seeing the screen and for interactions with the smart phone. All test users preferred it over the other materials.

For the display, we designed animations for 8 different Obis (4 initial with silicon sheets and 4 newer designs with acrylic). The animations are so far fixed and not dynamic. Yet, in the step, we plan to design interactivity. We are currently conducting a larger user study to assess the current design and to find interaction possibilities.

In discussions with users about our first prototype, they mentioned that they would love to show what is happening at a higher view point on the obi display. The users envision

the obi display as a viewing opportunity for children. A lot of events in Japan where users wear traditional clothing require a high view point (most prominently cherry blossom viewing, fireworks or matsuri) and there tend to be a lot of people.



**Figure 4:** The Kanzashi hair piece with embedded camera adjusted to capture cherry blossom tree crowns on the left, and the camera view on the enhanced obi display on the right.

Using this feedback from user interviews, we also designed a Kanzashi, a traditional hair piece with camera (see Figure 4). The camera captures a higher view point and can be adjusted according to the preferred direction. The obi application usually shows the pre-defined animation, however, if the user turns on the camera, the display changes and shows the live view of the camera. The user can also select to record a video and replay it later on the obi.

### Initial User Studies

So far, we conducted structured interviews with 5 female users (mean age 32, std:15). All of them like to wear traditional clothing with obi for several occasions (mostly for festivals). Although all user are interested in wearing an obi, it is at times complicated and most important doesn't fit to today's lifestyle such as carrying out belongings. 4 of them think that taking their smartphone along is a hazard



**Figure 5:** The four new designs pictures from the animation view.

and big problem. One user stated that since she got a new phone (Samsung Note), it got particularly bad as it is too large to fit comfortably into a normal Obi. After showing them the initial prototype and them trying it, all users liked the idea and preferred the Enhanced Obi to the old counter part.

We also asked the participants what type of information or interaction possibilities they wanted on the obi. 2 users liked the idea to re-live past events. One mentioned she wanted to show people in the subway or on the way home the fireworks she saw on the obi. Another user mentioned she was interested in displaying a part of the Kabuki piece she visited.

One user wanted to communicate emotion, showing her heart beat or interest to people around her. She imagines it is easier to find likeminded people if it's visible what a person likes. Another participant would like to display her current frustration level, so other people know how to approach her (e.g. don't make sarcastic jokes when she had a bad day). 2 users want to extend the display of the smart phone on the obi surface.

### Experience Report: Hanami

We also had 2 users wear all new enhanced obi designs during several days of Hanami matsuri (cherry blossom festival) this spring in Tokyo (see Figure 5).

The users attracted a lot of attention and it seemed easy for people to start social interactions with wearer (usually difficult in Japan). They got a lot of interest (questions about where to buy them) and people wanted to interact with the animations, touching the display. Several Children liked the animations and the live camera view.

The most positive feedback got the dark design in the evening when the lights got dimmer.

### Conclusion and Future Work

In this paper, we present an initial prototype combining technology with Japanese tradition to overcome a common problem in wearing an Obi (where to put the smart phone) and to create a new interaction/display surface.

In a next step we will continue our user study and collect more feedback related to the interaction possibilities, also discussing sensing options. For sensing we will first focus on smart phone sensors and then maybe other wearables depending on the application scenarios.

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