LUNE: Representing Lunar Day by Displayed Lighting Object

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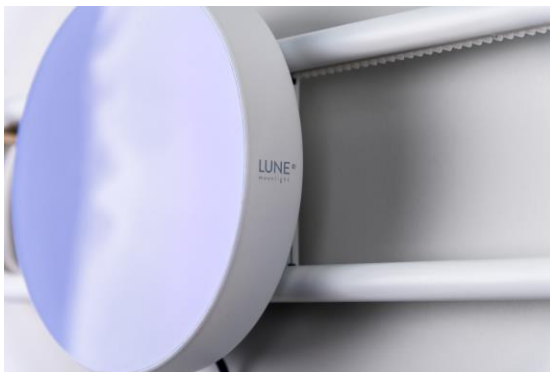seongb86@unist.ac.kr

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ABSTRACT

LUNE is a displayed lighting object representing time. It provides real-time lighting visualized moon phase. People can recognize the date of month through abstract image of moon. This product was developed to investigate the use of metaphor from lighting to represent time. A diverse set of researches and design initiatives related to time, temporality and slowness has emerged in the DIS and HCI communities. An important area of work is to represent time. The primary objective of this research is to suggest the new perspective of time called sense of time. First, we can understand how people perceive the time and we can also trace recent research related to perspectives of time in HCI. Second, we designed artifacts and investigated the use of moon phase as material to represent time in a new approach.

KEYWORDS

Temporality; Time Perception; Moon Phase; Nature Interaction; Slow Design
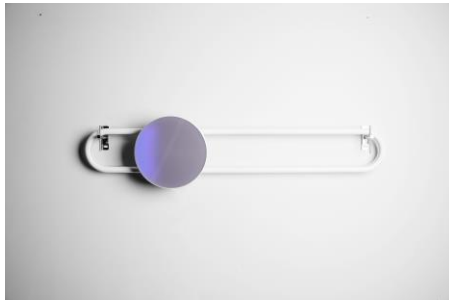

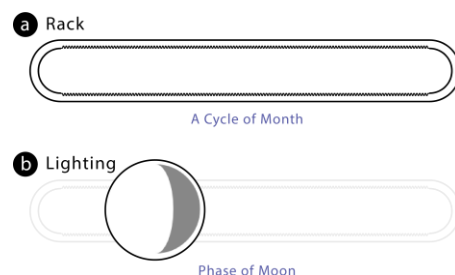**Figure 1: A system that consists of lighting and moving rack**

Figure 2: A system that consists of lighting and moving rack.

We suppose to flexibility with perspective of time to HCI research and practice. Our work aims to precisely contribute to the new of representing perspective of time.

1 INTRODUCTION

Time is speeding up in everyday life. Therefore, we take on the role of developing artifacts and systems that would help people to catch up with fast rhythms. Many of scheduling app and co-working app may reflect an overall speeding up of everyday life. On the other hand, some of researcher assert that acceleration has restricted our imaginative and explorative possibilities [6]. And several researchers have proposed Slow Design principles [5]. Likewise, time is a central issue in HCI and DIS communities.

2 REPRESENTING TIME

A diverse set of research and design initiatives related to time, temporality, and slowness has emerged in the DIS and HCI communities[1][2][13]. An important area of work is representing time [2]. It mainly includes how to depict the passing of time and how to organize calendars and schedules.

Therefore, it is important to look at the early years of time perception studies. The notion of time applies to two different concepts which may be clearly recognized from our personal experience of change: (a) the concept of "succession", which corresponds to the fact that two or more events can be perceived as different and organized sequentially; it is based on our experience of the continuous changing through which the present becomes the past; (b) the concept of "duration", which depicts to the interval between two successive events. Duration has no existence in and of itself but is the intrinsic characteristic of that which endures [3].

"Events are perceivable, but time is not." Gibson (1975) [3]Above the statement, the passage of time as a succession of events seems such a necessary part of our everyday experience. The perception of time depends on the event. With some watches people would perceive the current time. They also can recognize the year through situational cue of seasons and weather.

3 LUNE

LUNE is an attempt to create abstract events of the lunar and solar day by providing real-time visualized moon phase (Figure 1). LUNE is entirely divided in moving gear rack (Figure 2, a) and lighting body (Figure 2, b). The form of rack describes a cycle of month. The lighting is visualized by the shape of moon. The computational visualization is displayed by received API of date information. The main body of LUNE moves horizontally side by side. The aim is to allow people to recognize abstract time on the movement of lighting object.
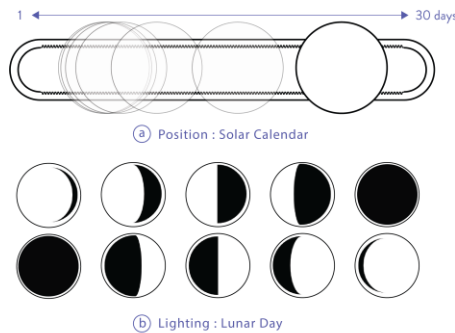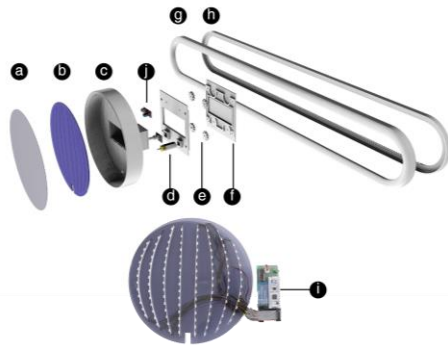
Figure 3: Representing the current day

Figure 4: A detailed structure of LUNE (a) Polycarbonate light diffuser, (b) Bracket for LED, (c) Lighting body, (d) Geared motor & encoder, (e) Pinion gears, 4ea, (f) Guide plate, (g) Cover, (h) Gear rack, (i) Embedded system, (j) Microphone

3.1 Design Rationale

As we spend more of our lives in interior space, we are deprived of many natural clues to the passage of day and season. Environment is an important factor that we assume current time. The moon is even more vivid, since it changes its shape every night. LUNE imply the metaphor of moon. LUNE is divided in two main areas. The rack is located at the backward area. The form of rack represents month days. The second area of display contains lightings that represents the phase of moon. It is visualized by the brightness of each RGB LED. The brightness is chronologically organized from left to right.

3.2 Interaction Techniques

LUNE is an interactive displayed lighting that represents the time through the position of device and visualized lighting. The main features of LUNE are as follows:

- *Tangible interaction with time and lighting*: We try to discover natural perspective of time. Some of artificial devices is not natural. For example, clock or upcoming schedule app. Therefore, we focused on representing time through more environmental factors. The moon provides calendar date through shape or brightness. We present experimental perspective of time and investigate the descriptive phase of moon.

- *Unawareness*: Computational objects do not require or rely on the attention of their owner to operate [8]. LUNE has no rapid changes in the system. The movement of LUNE is only 1 step per a day. The period is entirely month days from edge to edge in accordance of the moon. Due to the slow pace in which its movement, forgetting its existence actually helps users to notice the change [11].

3.3 Technical Implementation

The finalized technical implementation of LUNE split into two main interaction parts; Mechanical moving rack and lighting body.

- *Structure:* LUNE is an optimized system included mechanical and electronic parts. It enables user to control bi-directional movement mechanically. Basically, LUNE is a lighting object which have eight RGB LEDs, microphone sensor, motor, microcontroller.

- *Embedded System:* When a user connects the plug to the device, micro controller unit (MCU) begins processing. First, the device moves to the left-most. There is a trigger switch in the left. Once it reaches the left-most, the MCU automatically begins to initialize current position. It recognizes the mode of system whether it is manual or automatic. If a user selects automatic mode, the MCU begins to connect to the internet via wireless connection, and it receives the data of calendar date from the server. The MCU sends the value of target position to command.
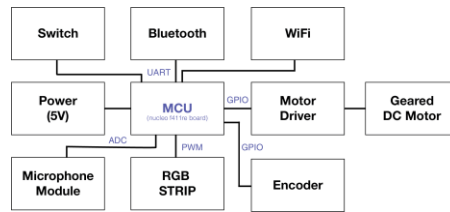
Figure 5: A block diagram of embedded system.

The motor combined by pinion gear rotates to the rack in order to move to the target position received from encoder. As it completed, the device stops comparing with the current position and a target position

4 CONCLUSIONS

In this paper we introduced LUNE, an interactive displayed lighting that represents the lunar day received from server. It provides physical movement of the device and visualized lighting of the moon. LUNE has a natural interaction which guides users to reflect their own time and to discover the unawareness [8] that do not require traditional interface or control mechanism. This paper represents experimental perspective of time and investigate the descriptive phase of moon. Particularly, we assumed three computational models to describe phase of moon and tested it to users. As a result of model separation, test results show that the third model is the most adequate case to describe phase of moon. We choose very natural interaction that people are accustomed to perceiving time. We hope our work will inspire future HCI research and practice into time perception. And We will consider a variety of nature material for example, seasons, weather, rain, wind and sound in the next research.

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ACKNOWLEDGMENTS