Tangible Lightscapes

Abstract

Tangible Lightscapes is a research on interfaces mainly based on light and gestures. The aim of my exploration is to design a vocabulary of light behaviours to show people what their devices are doing. This vocabulary consists of light behaviours and gestures that can be applied to a wide range of contexts where devices (speakers, headphones, memory storage devices, cameras, laptops...) are communicating wirelessly. This "device language" gives a concrete representation of the intangible and invisible events that are taking place. It allows users to feel more in control by providing them with a direct interaction with the objects they are using.

The vocabulary is described though 3 main tools: (1) a map of the light states/gestures matched with the most common activities of wireless devices, (2) a set of prototypes - light cubes - which represent three-dimensionally the vocabulary for demonstration and user testing purposes (as in http://vimeo.com/6671933), (3) two scenarios visualizing the light behaviours as applied to different devices in everyday life situations.

Keywords

Light and Gesture Interface, Tangible Interface, Light Vocabulary.

ACM Classification Keywords

H5.2. Information interfaces and presentation; User Interfaces: User-centered design; Interaction styles

General Terms

Design, Experimentation, Standardization, Human Factor

Introduction

Light can be a rich and meaningful tool to express behaviours through colours, brightness, shapes and pattern changing speed. Using a recognisable pattern is already a way to deliver content and information. Before developing my concept I conducted two rounds of user tests (14 volunteers) to understand if it was possible to design an interface using a simple light behaviour routine. I ran these tests using two simple prototypes; their interface is mainly based on the use of gestures and lights/colours. I designed the first behaviour routine according to my way of imagining the different states of the device (as in http://www.vimeo.com/5073463). In the second test session, instead, the light behaviour is completely based on the feedback collected during the
first round (as in http://www.vimeo.com/5064773). These tests led me to think that it is possible to create a common light vocabulary that can be largely understood: people have a clear idea on what is easier for them and why (even if there are different opinions on the same behaviour).

**Concept**
After the preliminary user research I designed and tested with 10 volunteers the light/gesture vocabulary for wireless devices.

The vocabulary consists of 2 different light feedbacks:

1. The **Connection Light** shows whether the objects are connected and communicating with each other. The light intensity is proportional to the signal strength. The light blinks when the connection is lost. The connection light shows *continuous* communication.

2. The **Control Light** pulses if the networked objects are exchanging data. Colour indicates sender and receiver. The light turns solid when the transfer is complete and can signal an error if something goes wrong. The control light shows *discrete* communication.

The research also demonstrates the use of gestures in devices that communicate without any physical cable. Today, connecting wireless devices is inconvenient: you have to go through interfaces that do not relate to the physical arrangement of the objects. It can also be difficult to understand which devices are connected and whether they are communicating.

In my prototypes, instead, to make a connection the user touches the two devices to each other. The light cubes/scenarios are tools for an ongoing research on people’s reactions to different light behaviours. The purpose is to discover the most intuitive match between the light’s activity and the meaning we want it to deliver. The aim of my research is also to raise the attention given to light interfaces: light can be a core feedback tool, engaging the users’ peripheral attention and thus avoiding information overload.

Well-designed device-to-device communication can lead to more intuitive user-to-device interaction.

**Conclusion**

- Users can pretty easily connect light behaviours to meanings and device states
- A basic/universal set of functions for wireless devices can be expressed through light statuses
- Today every device has its own vocabulary, making it hard for users to guess what it is expressing. A research on a “universal device language” could show potentials and opportunities for undeveloped interaction tools

**Further reading**
Extensive references are available on http://alicepintus.wordpress.com/

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