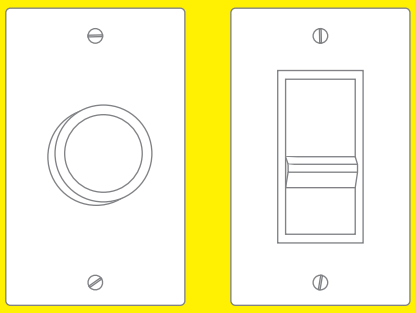
lux redux

re-thinking the dimmer



Dimmers give more control over lighting levels than a binary toggle, but present many of the same downfalls:

- Like lightswitches, dimmers can be located in unexpected places.
- Dimmers for the same light cannot be installed in multiple locations or any control feed-forward becomes moot.
- A continuous slider or dial makes it difficult to zero-in on your favorite brightness with each use.
- Dimmers are touched often, which is unhygienic.
- Multiple dials or sliders are needed for fine-grain control of individual lights.

Yet, dimmers have functional, emotional, and financial benefits.

- The motion of the dimmer is intuitive—an upward motion indicates "raising" the lights, downward "lowers" them.
- Using dimmers saves energy and can ease eye strain.
- The resting place of the slider corresponds to the brightness level, giving a visual indication of the system's status.

Products exist that have tried to maintain the benefits of dimmers while solving some of the problems.

For example, the Lutron Maestro Control Dimmer (see image below) works with a digital touch-pad rather than an analog slider or dial. This allows for multiple dimmer locations as well as remote control. A histogram of LEDs indicate the current brightness level, which is controlled by a slim rocker on the side of the panel.

Lutron's product is only part of the solution, answering only some of the problems I mentioned earlier—and creating new usability issues for visitors unfamiliar with the system (tapping, double-tapping, and sustained pressing are not as intuitive and abandon the spirit and satisfaction of an analog dimmer switch.

My redesign of the classic dimmer will work with cultural assumptions of location of and interaction with lighting control. It will preserve the satisfaction and instant feedback of dimming. It will also implement technology in non-disruptive ways while also re-linking the control with the light source itself—meaning no lost remotes or hunting for the correct wall switch.

A touch-less "virtual" dimmer could retain the benefits of analog dimmers and digital products while avoiding their shortcomings:

- Touchless is hygienic.
- Technologically extensible (lighting control could be linked to the internet, smart house systems, iPhones).
- Preferences can be preset or altered on the spot.

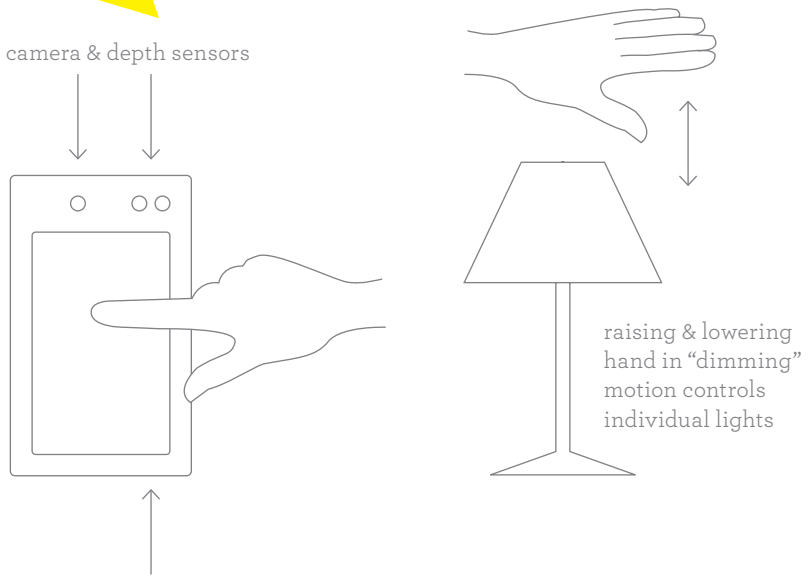
Amy Bickerton Spring 2010
Beginning Interaction Design

the redesign

LuxRedux uses both touch screen and motion capture technology similar to Microsoft's Project Natal (see image below) to keep the spirit and control of an analog dimmer while taking advantage of digital technology.

The screen and sensors are located where a lightswitch would traditionally be placed—at about shoulder-height on the wall next to a door—working within cultural assumptions. The LuxRedux can be swiped like a dimmer, giving visual feedback of brightness level. Alternatively, a wave of the hand as you enter the room can toggle the light "on" to your favorite brightness.

Unlike a traditional dimmer, LuxRedux disseminates lighting control throughout the entire room. It is linked to every lightbulb, allowing fine-grain control and zoning of lighting conditions. Similar to the interaction with a theremin—a musical instrument that changes tone as you move your hand up and down (see image below)—you can make the "dimming" motion with your hand above or below a particular lightbulb to change its brightness. This is made possible by the wall-mounted camera and depth sensor. Because you are controlling the bulb brightness at the source, it eliminates confusion over "what switch works what"—a situation in which we have all encountered. This interaction harkens back to the origins of electric lightbulbs and fixtures, whose controls were located at the base (see image below).



inspiration

The images to the left—a theremin, the Lutron Maestro Control Dimmer, Joseph Swan's electric lamps from 1878, and a Microsoft Xbox with Project Natal sensor—represent the technology and interactions that can optimize dimming control.