Cord UI

Project 1 TANGIBLES WITH DIGITAL SHADOWS

Team: Patrick Johan Nicolaas van Hoof, Philipp Schoessler, Sang Leigh & Krithika Jagannath

Cords are usually viewed as messy and unsightly objects. Wireless technologies have been used for a while now to enable data connectivity in most computers or mobile phones and they are being used increasingly to charge devices and appliances, thereby eliminating the necessity of cords. Still, wires and cords are here to stay for at least a few more decades. In this project, we developed novel ways to render a new appeal to cords and thereby make a case for the presence of cords. In our research we came across papers in which ropes were used as tangible objects with digital shadows as well as instances where a few artists have used cords in a creative manner to accentuate decor. We decided to use the cord or cable itself in a novel way, to represent a certain functionality of the device. We explored two kinds of interactions namely, shape (knots, coils, etc) and linear (sliding, pressure, etc.). The following scenarios illustrate our ideas for using cords.

For the **shape-based interaction**, we make **knots or loops** with cords (digital shadows). First, knots on cables either manipulate a specific parameter of an appliance or toggle the state of a given application. The rigidity or looseness of a knot controls a parameter of an appliance in one case. In the other case, the tying or untying of knots enables us to toggle between a given set of states of an application. In our prototypes, a knot on the cord connected to an LED table lamp controls the intensity of the light; the tighter the knot is, the dimmer the LED light glows and the looser the knot, the brighter the lamp glows. This is based on the principle that a knot constricts or cuts-off the flow of something (light, volume, data, etc.) depending on how it is tied. As another example, a knot on the cord of a headset could control the volume parameter (between mute and high). For the other approach with knots, we borrowed inspiration from the old tradition of tying knots in one's handkerchief to remember important things. We built our second prototype to tie knots to create task reminders in the user's calendar (iCal, for example). Untying the knot after completing the task or event deletes the reminder. In other words, toggling between tying and untying the knot would create or delete reminders. In the second type of shape-based interaction, the cord acts as a physical and tangible representation of digital data with a strong perceptual coupling. The specific manner in which the cord is wound/tied around an object would yield specific outcomes. With the cord wound spirally, the number of loops and the distance between them control the settings of the electronic appliance or device.

In the case of **linear interaction**, we use touch or pressure to make the cord manipulate various parameters of devices to which it is connected. 'Pinching' the cable and varying the pressure applied, for instance would increase or decrease a specific parameter. Aside the shape-based interactions presented above, user's behavior with cords can be used as interaction. The line-shaped form factor lets users to slide fingers along cords (1-D slide control) or pinch it (pressure), or twist and swing the cord like a cowboy. Each different interaction could be matched to different sense/feelings; sliding - increase/decrease value, pinching - flow control, twisting tweak/squeeze, and so on. Plus, these user's input could be coupled with the two shape-based interaction presented, to give a much richer vocabulary.

In conclusion, we believe that the ideas described above allow for an interesting way to give cords an additional layer of utilization. Linear flexible materials such as cords, wires or ropes offer a rich pallet of metaphors and possibilities for tangible interaction.