

The WANDerful Alcove: Encouraging constructive social interaction with a socially transforming interface

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Abstract: In this paper, we introduce the notion of a *socially transforming interface*, which is an interface that, when wielded, transforms its user into a more social character in a digital interactive experience than he or she would be normally, one in which the user is more likely to interact and collaborate in an ad-hoc and constructive way with other people as part of the experience. We also describe a work-in-progress story installation called the WANDerful Alcove, an interactive play space in which participants wield magic wands and practice wizardry, as a potential example of this concept. A study is now underway to verify this intuition.

Keywords: Socially transforming interface, tangible interface, magic wand, social interaction, ad-hoc collaboration, interactive storytelling

1 Socially transforming interface

In this paper we introduce an interaction concept that we call a *socially transforming interface*. A socially transforming interface is an interface that, when wielded, transforms its user into a more social character in an interactive digital experience than he or she would be normally. In this role, the user is more likely to interact and collaborate in an ad-hoc and constructive fashion with other people that are physically present in the experience. These may be people the user knows, or they may be people the user doesn't know and may not have spoken to or acknowledged in any way, in which case such an interface could serve as an ice-breaker. Having broken the ice with these people, a basis may be formed for interactions to continue after the interface is left behind and the experience finished.

We do not envision a socially transforming interface as something to encourage contact between people online, separated by a distance, or even inventing their own identities, as is the scope of applications like Internet chat rooms and communication tools. A socially transforming interface is focussed primarily on potential contact between people who are in physical proximity to each other. Although the concept may be applicable more broadly, we

concentrate this discussion on the context of interactive digital experiences.

Beyond merely encouraging constructive social interaction between these people in some way, a socially transforming interface aims to transform its user into a more social entity than he or she was before, both outwardly and inwardly. The outward transformation comes partly from the form of the interface, which may give its user an overall appearance that suggests playfulness and invites ad-hoc interaction to a greater extent than his or her natural appearance. The inward transformation potentially comes from any sense of immersion in a role or amplification of a sense of play that may accompany the wielding of the interface and the power associated with it in the digital experience.

We imagine that a socially transforming interface would also necessarily be a tangible interface, a notion developed by Ishii & Ullmer (1997) and others, and perhaps something carried or even worn. Unlike screen-based interfaces, tangible interfaces exist in the physical world and carry a physical meaning, and as such they may accentuate awareness of the physical and social environment around us while also serving as an interface to something in the virtual world.

Technologies for “breaking the ice” between people are an increasingly rich area of research and development, with examples ranging from the Japanese *Lovegely* and similar products to digital conference contact assistants like *Spotme*. The social and ice-breaking qualities of “sports over a distance” games with “exertion interfaces” has also been studied recently (Mueller, Agamanolis, & Picard, 2003), with results that suggest providing a venue for a structured shared experience may be an important ingredient. The notion of a socially transforming interface differs from these efforts primarily in that they do not have the specific aim of transforming the user into a more social creature—the user is essentially the same person as he or she was before from both an inward and outward perspective, in part because the interface may not visible or may not designed to invoke a enhanced social role.

Live action role playing games have also provided an interesting context for research on interfaces for interactive storytelling (Falk, 2003). While not focussed specifically on motivating contact between different participants, this kind of research provides a growing understanding for how to build objects that encourage role playing and immersion in a story world which may be helpful to inform the development of socially transforming interfaces.

If a socially transforming interface is successful in its effect on its users and even in generating new contact, we feel it is important for that contact to happen on a positive or constructive note, not one, say, of violence or mutual destruction as is the context for many multi-player games. The design of an underlying experience and ambient environment of which the physical interface itself is a part is a potentially critical factor in setting a desired tone for the interaction.

Whether or not the concept of a socially transforming interface is a valid or helpful one is an open question. We are developing a fairy-tale story installation called the WANDerful Alcove, which incorporates a magic wand interface that might qualify as a socially transforming interface, though a study would be necessary to verify this claim. We describe this work in progress below, followed by some thoughts on next steps and speculations on how to evaluate this and other interfaces on their socially transforming qualities.

2 Magic Wands

Magic wands have a presence in the history and legends of human cultures from thousands of years ago all the way to the present day, and are surrounded by rich systems of belief. Often carried by wizards, these sticks, or in some cases large rods, focus magical strength. Some anthropologists believe that Stone Age cave paintings showing people with sticks are meant to portray leaders of clans holding wands to attest to their power. That is only a guess, but strong evidence goes back at least to the time of ancient Egypt, in which hieroglyphs show priests holding small rods. In Greek mythology, the messenger of the Greek gods carried a special wand called a caduceus. This is a rod with wings, around which two serpents are twisted, meant to signify wisdom and healing powers. Physicians adopted it as their symbol hundreds of years ago and still use it today. This and more historical background on magic wands can be found in Colbert (2001).

Magic wands are simple objects that respond to human gesture, speech, emotion, and even thought, and thanks to modern-day books and movies, they are widely understood from an early age as symbols of great empowerment. Many who have experienced these stories may have gained somewhat of a mental model or an intuitive sense for how to use a magic wand, i.e. what kinds of gestures can be made with it or what words should be said to cast a spell (“Abracadabra!”, “Hocus Pocus!”...). Considering these factors, the magic wand presents an interesting design opportunity as a form for a tangible computer interface.

Others are exploring the potential of wand-like forms as interfaces to digital information or ubiquitous computing environments (Wilson, 2003). Besides exploring the technology needed to build a magic wand interface, our research is attempting to forge a different path in which we retain the magical quality of a wand in the context of a story environment, and in which the wand serves not only as a tangible interface to a fairy-tale world, but also a socially transforming interface with effects in the physical world.

3 The WANDerful Alcove

The WANDerful Alcove is a work-in-progress interactive installation that we are using to explore the potential of a magic wand as a socially transforming interface. Our effort is similar in spirit to installations like the *KidsRoom* (Bobick, et. al, 2000), as well as *Wheel of Life* (Davenport & Friedlander, 1995), which introduced the notion of a transformational environment in which participants assume roles in a story that happens around them.

The WANDerful Alcove consists of two magic wands and a large projection of a story scene consisting of an elder tree in an enchanted landscape. The magic wands, initially sitting on small stands, are made from tree branches (as in *The Lord of the Rings* and *Harry Potter*), and are decorated to enhance their magical quality as well as to hide the technology embedded within them. All of these elements exist within a controlled physical environment that is decorated and lit to further suggest an atmosphere of mysticism and to motivate passers-by to enter the space [Figure 1].



Figure 1: Two participants wielding magic wands in the WANDerful Alcove installation.

Each wand has a different magic power associated with it. Passers-by who enter the alcove and pick up a wand can make something happen in the scene immediately by gesturing with it — either lighting strikes or explosions depending on which wand is wielded. These appear in the magic scene accompanied by the appropriate audio effects.

Just as a real wizard student would, the participant must learn what kinds of movements to make, what kind of rhythm to use, and even what words to say in

order to create the right magic. This learning can happen through experimentation, by watching others who have already figured out how to use the wand, or by reading a “book of spells,” a magic manual that is placed within the space. With some practice, the novice wizard will gain skills in the use of the wand and learn special magic gestures that cause a more controlled reaction in the story scene, either the creation of a rain storm or the emergence of the sun [Figure 2].

Instead of competition and mutual destruction, the story concept was designed to encourage and reward ad-hoc collaboration between multiple wizards. The participant is challenged to be physically active, focusing not only on his own actions but also on that of the others, to share magic power and create something beautiful together. For example, if two wizards collaborate and perform their special gestures at the same time, a rainbow emerges [Figure 3].



Figure 2: Rain can be summoned by performing a special gesture with one of the wands, and sun with the other.



Figure 3. Participants who work together to summon the rain and the sun at the same time can make a rainbow.

Our first magic wand prototypes included simple tilt switches embedded in natural tree branches and required a small wire, made as inconspicuous as possible, to connect them to a computer running a

gesture recognition algorithm to detect the rhythm of gross motions made with the wand. A wireless version using accelerometers as the sensing component is under development as of this writing.

4 Next steps

We cannot yet answer the question of whether or not the magic wands in the WANDerful Alcove are socially transforming interfaces. A careful study would be required to draw any conclusions, and we are just entering that phase of our work now. On the other hand, we do believe the wand holds potential as a such an interface; it is something that, when held, may enhance its holder's appearance to others, drawing attention and inviting contact; it is something that when held, in the context of the story installation, may allow its holder to inwardly take on the playful role of a powerful wizard, yet also a sociable wizard who must make social contact and coordinate with other nearby wizards in order to constructively share power and create something beautiful together.

How to design a study that would enable us to say something meaningful about the socially transforming effects of the interfaces in the WANDerful Alcove or other installations, past and future, is an open question. A potential first step would be to build the installation in a different space, perhaps one consisting of many passers-by who don't necessarily know each other and would not normally interact (maybe a traditional museum gallery, a waiting room, a passageway in a public building...), and to observe the types of social interactions that occur, comparing these to observations made in other installations.

In any case, a study of this sort is a next step in our research, in addition to further technology improvements to the magic wand to enable the recognition of a richer set of gestures a person would learn as well as the kinds of gestures that people may

intuitively understand they should make with a magic wand. We will also continue to refine the general concept of a socially transforming interface, which we hope will encourage and inform the design of future interfaces and installations.

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