

# How the move to physical user interfaces can make human computer interaction a more enjoyable experience

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## 1. INTRODUCTION

As the interface moves away from the WIMP paradigm and becomes more physical or tangible, the field of HCI is expanding to include alongside usability goals, user experience goals [8]. There are many aspects of these new physical interfaces that, in addition to other benefits over WIMP interfaces, I argue will provide more pleasurable interactive user experiences. Below are just a few.

Physical interfaces can offer a direct relationship between information and control, and even allow direct control of virtual objects through physical objects. Laurel discusses how traditionally interaction technology interfaces are considered as intermediaries between the person and what they want to achieve [7]. In contrast, in order to promote engagement in interaction she argues the system should provide the user with interactive first-person-ness, allowing them to act more directly. A physical interface could achieve this. Having good control is rated by people as one of the important aspects of a pleasurable product [3]. Schneiderman [9] suggests that people like to have control of their interactions as it gives them a sense of power over the system.

Physio-pleasure, to do with the body and sense organs, is one of the four types of pleasure involved in pleasurable experience [6]. An important part of the experience of a product is in feeling or touching it, the satisfying clunk of the car door shutting, the smell of a new magazine. Another of the four pleasures, ideo-pleasure highlights the importance of how something looks, its aesthetics. In the world of physical interfaces the look and feel of interaction can be taken to new levels.

The theory of flow describes situations in which optimal experience can be achieved [2]. One important factor is the provision of immediate feedback to actions; this is of course important for usability in any type of system. With a physical interface it is possible to provide feedback in a variety of modalities. An important aspect of a tangible interface as described by Ishii and Ullmer [5] is the seamless integration of representation and control. The physical state of the system partially embodies the underlying digital state allowing the user to feel and to see in a 3D environment the state of the system. The games industry already utilises this introducing more physical controllers and even providing haptic feedback.

People's attention is automatically drawn to things which are novel in our environment. We form schemas or expectations about what might happen next given the context which allows

us to prepare. We are surprised if this expectation is not met, or uncertain if more than one expectation is aroused at once. Berylne [1] suggests this raises our arousal (readiness to react) levels and that slight transitory jumps in arousal can be pleasant because of the relief felt afterwards. This can be exploited in physical interfaces by coupling familiar physical objects with unexpected or unusual digital capabilities. Ambiguity can be introduced into design by placing something out of context or not presenting complete information about what the system knows or is displaying [4]. This can produce "intriguing, mysterious and delightful" results and encourage close personal engagement with the system.

For any interface the goal of the user is the most important thing. In an extension to Maslow's hierarchy of needs, [6] suggests that once we have functionality, then we will want usability and once we have that we will want it to be a pleasurable experience. By enabling more direct control and feedback on a number of levels, providing pleasure through the look and feel of the physical aspects of the interface and with the possibility to intrigue, it seems clear to me that the physical user interface can help take us the step beyond usability.

## 2. REFERENCES

- [1] Berlyne, D.E., *Conflict, Arousal and Curiosity*, McGraw-Hill, 1960.
- [2] Csikszentmihalyi, M., *Finding flow: the psychology of engagement with everyday life*, Basic Books, New York, 1997.
- [3] Flyte and Nilsen, Understanding attributes that contribute to pleasure in product use. In W.S. Green and P.W. Jordan (Eds.), *Pleasure with products: Beyond Usability*, Taylor & Francis, London, 2002, pp. Chapter 19.
- [4] Gaver, W.W., Beaver, J. and Benford, S., Ambiguity as a resource for design. *CHI (in submission)*, 2003.
- [5] Ishii, H. and Ullmer, B., Tangible bits: Towards seamless interfaces between people, bits and atoms. *Proceedings of CHI '97*, ACM, Atlanta, GA USA, 1997.
- [6] Jordan, P.W., *Designing Pleasurable Products*, Taylor & Francis, London, 2000.
- [7] Laurel, B., Interface as Mimesis. In D.A. Norman and S.W. Draper (Eds.), *User centred system design: new perspectives on human-computer interaction*, Erlbaum, Hillsdale, 1986.
- [8] Preece, J., Rogers, Y. and Sharp, H., *Interaction design: beyond human-computer interaction*, John Wiley, Chichester, New York, 2002.
- [9] Schneiderman, B., *Designing the user interface: Strategies for effective human-computer interaction*, 3rd edn., Addison-Wesley, Reading MA, 1998.