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# Supple Interfaces: Designing and evaluating for richer human connections and experiences

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**Abstract**

The aim of this workshop is to create a common language for discussing the issues involved, the research challenges, and progress already made in designing and evaluating “supple” interfaces. Supple interfaces aim to build richer connections between people as well as deeper emotional experiences through interface. Examples include affective interactive systems, games, and relationship-building systems. For these kinds of applications, the CHI community is struggling with a new set of design values and accompanying challenges that can be hard to articulate and thus to advance as a community. These application spaces and interaction modes require an emphasis on the quality of experience rather than outcome, and often involve subtleties of the dynamics of engagement with such interfaces and with others through these interfaces. Through hands-on experiences, presentations, and active discussion during the day, we hope to make a start at creating a coherent working framework for this area that can be shared with the larger CHI community.

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Figure 1. Nintendo Wii controller, used in Excite Truck, an off-road racing game.

### Keywords

Supple interfaces, Dynamic user experience, affective interaction, sensors, biometrics, engagement, nonverbal interaction, fun, emotion

### ACM Classification Keywords

H5.m, Classification, Information Interface and Presentation, User Interfaces

### Introduction

The emergence of sophisticated and commercially available input devices to track human expression (e.g. cheap sensors, game controllers with accelerometers, gesture and face recognition through cheap and readily available cameras) and the rapid expansion of non-productivity interface applications (games/play, relationship-building and communication) has led many in the CHI community to struggle with a new set of design values and accompanying challenges that can be hard to articulate and thus to advance as a community. We know that these application spaces and interaction modes require an emphasis on the quality of experience rather than outcome, and often involve subtleties of the dynamics of engagement with such interfaces and with others through these interfaces. Yet we do not have a coherent language with which to discuss these design values or articulate strategies for achieving desirable effects and outcomes.

Beginning at the end of the 90's and continuing to now, we have seen an important and very interesting shift towards seeing users as something more than being efficient, involved workers. It is a reaction against the rationalized, efficiency perspective on what people can and should be doing in their life. The ludic aspects of life, play and fun, as well as the inner life, and

especially emotions, have been put into focus [2],[4]. A shift towards finally, after centuries of separation, integrating body and mind has moved throughout the research world, all the way from neurology, psychology to design of information technology [1].

At the same time, information technology products have made their way out into society, moving from the work place into almost every aspect of how we live our lives. Mobile and ubiquitous technologies have gained ground and computers are no longer solely PCs placed on our desks at work or somewhere in our homes far away from the kitchen or living room. Computers are nowadays something that we carry in our pockets, integrate with our home entertainment systems, communicate through and with in almost every imaginable context – while on our boat in the archipelago, on the bus, or in the shopping mall. The shift from focusing on work contexts to consumer markets is obviously following this movement. Designing for such applications, which are more deeply intertwined with everyday life and interaction especially in bodily/physical ways, requires new ways of approaching goals, evaluation, and even the underlying theory that helps to guide values and choices of practitioners.

We feel it is time for those working in this emerging area of HCI to come together to create a common language for discussing the issues involved, the research challenges, and progress already made. Our aim is to look for principles and grounding in theory as well as in design as practiced in these new application areas. We need to move from specific examples to weaving together what has been learned to forge a larger, shared picture of this emerging field.



Figure 2. eMoto on the mobile phone with extended stylus

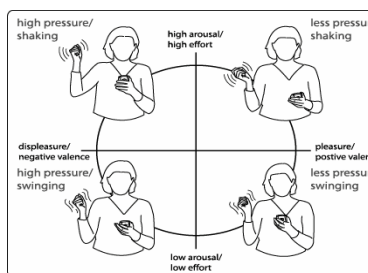


Figure 3. Interacting with eMoto through gestures



Figure 4. Color circle mirroring gestures

The workshop will take advantage of the San Jose location to appeal to local games, mobile, social software, and other industry practitioners to join in the dialogue for a day, merging their hands-on experience with that of the broader CHI community of researchers and practitioners.

### Defining the 'Supple' Experience

What exactly do we mean by 'supple interfaces'? Supple interfaces can be characterized by their focus on:

**Subtle Signals:** Rich human communication and interpretation strategies (e.g. emotion, social ritual, nonverbal communication, kinesthetic engagement). Supple interfaces address users not only intellectually but also physically, typically involving their bodies in the interaction in some way. This may involve face, gestures, biosensor data or general aspects of interaction picked up by various sensor technologies.

**Emergent Dynamics:** Taking into consideration subtle communication dynamics that require new thinking about system adaptivity and feedback. For example, increased legibility of system moves to help users actively co-construct practice and meaning and push system boundaries in interesting ways.

**Moment-to-moment Experience:** Privileging the quality of moment-to-moment experience both in terms of design and in terms of evaluation of success of design (e.g. a focus on engagement, pleasure, rapport).

### Examples

Example systems can be found in games, affective interactive systems, affective computing, sports

applications, relationship-building applications, mobile applications and a range of other non-productivity interfaces.

Commercially, the games industry has led the way in bringing supple interfaces to market—Nintendo in particular, with the release of the DS handheld with its touch screen and audio input, and the impending release of the Wii platform with its built-in accelerometer, has provided game developers with myriad opportunities for creating supple interactions with users (e.g. the popular Nintendo game for the DS, or the body-engaging racing interaction in the to-be-released Excite Truck, shown in Figure 1.).

Supple interfaces typically engage the person in emotional/affective ways, with the use of physicality creating a sort of 'affective loop' [6]. An example system that has been designed from this perspective is eMoto (see Figures 2, 3 and 4) [6]. In eMoto, users compose text messages on their mobile phone and then use an extended stylus that can pick up pressure and shaking gestures to express the emotional value of the message. The gestures are translated into colors, shapes and animations in the background of the text message.

Supple interfaces also seek to support subtle relational dynamics between people. For example, in *Feather, Scent and Shaker* by Strong and Gaver [5] a set of designs that we would consider supple interfaces are described. For example, with *Feather* a couple has one device each; the person who is away from home has an interactive picture frame and the person at home a cone containing a feather. When one user is handling the picture frame, a fan starts blowing the feather at

home, illustrating affection in as a poetic experience of connection.

### Issues and Agenda

This workshop will bring together a mix of practitioners in both design and evaluation, as well as researchers and theorists, to do several things:

- Share experiences in design and evaluation process for these types of interfaces.
- Allow one another to viscerally experience sample interactions (we will encourage system demos, and will bring the Nintendo DS and Wii platforms for participants to try out and discuss).
- Share relevant theory and concerns about the grounding of this area of design.

Some issues we think will come to the forefront:

- Whether making supple interfaces is different from the design process for other areas of HCI. Does it require different kinds of engagement with users? New forms of prototyping? Different team composition?
- How and when we know that we've succeeded. Are evaluation criteria different from other areas of HCI? What sorts of measures are appropriate? What does rigor mean in this type of design?
- Grounding in theory. Does this type of practice require us to draw upon different research literature, for example nonverbal notation systems, emotion research, philosophy of experiential design, theories of play, flow, and other experiential qualities? Can we create a shared body of references to help guide new practitioners?

### Outcomes

Ideally, participants will leave with:

- A stronger shared sense of core issues and practical considerations in designing and evaluating 'supple interfaces', including a common language for discussion.
- A set of shared, experienced examples of what a supple interface can be, from both research and current product arenas.
- A set of common research aims and challenges, to share with the broader CHI community, as well as any emerging best practices, resources, and caveats.

### References

- [1] Damasio, A. R. *Descartes' error: emotion, reason, and the human brain*, GP Putnam, New York, 1994.
- [2] Gaver, W.W. Designing for Homo Ludens. *I3 Magazine* No. 12, June 2002.
- [3] Lindström, M., Ståhl, A., Höök, K., Sundström, P., Laaksoaho, J., Combetto, M., Taylor, A., and Bresin, R. Affective Diary – Designing for Bodily Expressiveness and Self-Reflection, In *Proc. of CHI 2006*, Work in Progress paper, ACM Press (2006).
- [4] McCarthy, J. and Wright, P. *Technology as Experience*. MIT Press, 2004.
- [5] Strong, R., and Gaver, B. Feather, Scent and Shaker: Supporting Simple Intimacy, In: *Videos, Demonstrations, and Short Papers of CSCW '96*. ACM Press (1996) 29-30.
- [6] Sundström, P, Ståhl, A. and Höök, K. (forthcoming) In Situ Informants Exploring an Emotional Mobile Messaging System in Their Everyday Practice, accepted to the special issue of *IJHCS on Evaluating Affective Interaction*.