
Choreographies at Home as Objects of Design

Antti Pirhonen

Dpt of Comp Sc & IS
Univ of Jyväskylä, Finland
FI-40014
antti.pirhonen@jyu.fi

Jaana Parviainen

Schl of Soc Sc & Hum
Univ. of Tampere, Finland
FI-33014
jaana.parviainen@uta.fi

Abstract

In traditional movement theories, the centre of movement has been the human body, whose specific movement patterns and qualities indicate psychological orientation and features of the mover's inner life. However, we consider that these movement theories are not necessarily useful to capture dynamics of movement constellations which the moving body has with actual or virtual objects. In developing a novel choreography-based methodology we do not focus on single gestures and postures but affective connections or disconnections, patterns or routines people create with digital devices or physical objects at home environment on micro, local and macro levels.

Kai Tuuri

Dpt of Music
Univ. of Jyväskylä, Finland
FI-40014
kai.tuuri@jyu.fi

Author Keywords

Interaction design; Movement; Choreography; Design methodology; Body; Phenomenology; Sensorimotor experience

ACM Classification Keywords

H.5.2. User Interfaces: Theory and Methods

Introduction

A common assumption is that technology should – and will – make life easier, decrease the amount of "dull" everyday duties and increase leisure time. This has also been the striving force in developing new machines and commodities for helping us in our domestic routines. In many cases, this way of thought has proven to be successful. The introduction of washing machines and refrigerators has greatly reduced the necessity of physical work. There are, however, quite opposite stories to tell as well. During the introduction of home computers in the late 70s and early 80s, this new machine was strongly advertised as a practical all-round family commodity that, for example, could be used for cataloguing food recipes [1][2]. Instead of domestic duties, home computers were mostly used for leisure activities, typically for playing games. Since then, computers have changed our lives at home in many ways, but the decades-old vision of the pervasively computerised intelli-

Copyright is held by the author/owner(s).

CHI'13, April 27 – May 2, 2013, Paris, France.

ACM 978-1-4503-1952-2/13/04.

gent home of the future (see, e.g., [2]) has yet failed to be realised.

While there is nothing wrong in stressing the positive opportunities of technological development, a critical and more holistic position is needed on bringing and designing technological applications into home environment. The prevailing practice of first developing new technologies and devices and then discovering their applications (and needs) in the home environment pose severe challenges. In terms of interaction design, these challenges include the risks to overlook the following:

- 1) The flowing choreographies of everyday activity in the context of home and how technological appliances collides with them (or even miss the target altogether).
- 2) Sensorimotor, experiential aspect in our acting on objects of the environment. Experience is not just hedonistic 'creaming of the cake'. Rather, it matters in terms of functionality and cognition as well.
- 3) The *big* and far-reaching ethical, cultural, and societal (maybe even evolutionary) issues that concern the roles of technology in our lives.

Approaches of human-computer interaction (HCI) design have their roots in quite different usages of technology than what a ubiquitously computerised home require. In the course of change of forms of computing, HCI studies have undergone a gradual evolution to adapt to new circumstances. This development has resulted in different paradigms of research/design, referred to as the three waves of HCI [3].

The most recent wave, utilising methods such as ethnography, participatory design, use scenarios, narratives and interaction analysis, may be outlined as phenomenologically-situated paradigm of HCI design [3]. Within this paradigm, embodied and sensorimotor experience of interaction is also gradually more and more acknowledged, for example, by the means of situated experience sketching [4][5].

Interaction design for movement-based input have raised new questions about the moving sensing body in human-computer interaction. More recently, the emphasis has shifted to the affective aspects of human movement and expression, focusing on recognition and simulation of experiential movement [6]. The recognition that human cognition is embodied action, is fundamental to recent trends in interaction design [7]. One of the crucial questions is on what kind of theories of movement interaction designers base their notion of interactivity with interfaces. To understand this embodied interaction and its mobility, we need a coherent theoretical foundation and new analysing methods that can develop meaningful understanding of complex kin-aesthetic and affective aspects as they appear through bodily movements.

We feel that the biggest obstacle in overcoming the above design challenges lies in the current tendency of describing and conceiving interaction and its context in static terms of devices, artefacts, functions, experiences and events, instead of emphasising the living, embodied dynamicity of interaction experience. Although there exist design methods that put the focus on dynamicity (by means of e.g. narratives or enactions), the holistic common foundation for the dynamicity in design is still missing.

Just another ambiguous concept?

What: Through movement, choreography-approach encompasses our intentions, affect, acts, experience and the environment.

Why: The ultimately corporeal nature of ourselves makes it natural to take observable and imaginary movements as a framework for conceptualising our everyday life. Choreography-approach is applicable whether we ponder the user-interface of single product or the daily life at home as a whole. Using choreography as a guiding thread helps to prevent a babel resulting in the random collection of actions required by individual items.

In this paper we propose a novel choreography-based methodology, in which the very starting point and the ways of design focus on the movement and actions performed/experienced within an environment and its objects. In other words, the design of isolated technological objects and features has a secondary position to the choreographies they are involved with.

A Choreographical Way

Choreography is usually related to dancing and bodily movement patterns, performed by professional dancers at theatres. In recent years, choreography has been admitted a theoretical concept in different disciplines [8][9]. For instance, Baker & al. [8] replaced the term orchestration with choreography in studying web services, by arguing that "Choreography is an unambiguous way of describing the relationships between services in a global peer-to-peer collaboration, without requiring orchestration at all." By choreography we mean all bodily movements and activities in which movements appear to form meaningful interactions and relations between different animate or inanimate agents. It includes both a plan for the action, the action itself and all the agents it draws together.

Different "home choreographies" such as cleaning, cooking or using computers are not just limited in the physical location of household but they extend over the walls of an apartment depending on the target of the function (e.g. expecting dinner guests), tools needed in activities (e.g. a vacuum cleaner made in China) or devices used (e.g. sending emails). Home choreographies are not just private activities but they have dynamic social and organising functions in the whole society. Most bodily movements we are doing at our apartment are pre-choreographed in the sense that physical spaces create choreographies within offering spatial limitations and possibilities. These limita-

tions and possibilities are not just material but also cultural, social and technical ones. The architectural solutions of the apartment as well as cultural practices and technical solutions pre-choreograph our bodily movements, providing or suppressing opportunities for social interaction with other people.

In terms of interaction design choreography refers to acknowledging how design choices affect movements and actions while also taking into an account the pre-existing choreographies of the given situations. The approach does not make difference between artefacts of different technological nature; table, tablet-computer and walls of the room can be conceptualised through choreography.

In the choreographical way of interaction design the environment and its objects are essentially conceived in terms of bodily movement (or movement potential) they situationally are coupled with, in terms of individual's motor repertoire and cultural habits (i.e., affordances are handled as pre-choreographies).

Applying the Choreography Approach

Currently, the introduction of technology for homes implies the marketing of individual gadgets. Interaction design, in turn, is often conceptualised as the design of user-interfaces of those gadgets. We have argued here that there should be more holistic criteria for the design of interaction with technology if we aim at contributing to the construction of good life at home. Being holistic does not mean the introduction of general, abstract design principles only. Rather, we aim at introducing a scalable framework, which would cover multiple levels from "big picture" to the subtle details of interaction. Initially, we have divided the levels to macro, local and

micro levels. Applying the framework for the design of e.g. novel coffee-maker, would imply

1) Macro-level (relations to the outer world). The analysis of making coffee at home: why, when and to whom? How does the coffee-making process (coffee beans produced in Columbia, a coffee-maker made in China, etc.) as an everyday action produce a kind of global choreography within different agents and related to the global trade?

2) Local level (moving in home environments). How does the usage of the new device connect to the related activities at kitchen (ergonomics of the whole kitchen)? What kind of social and affective relations does making and drinking coffee together create between family members?

3) Micro-level (micro movements and kinaesthetic subtleties). What kind of automatic and habitual movement patterns do people make in measuring coffee and water for a coffee-maker?

In the proposed framework, many of the established practices of interaction design are fully applicable. I.e., there is no need to start from an empty table in terms of methods. The change takes place in the perspective: what are we trying to find out with those methods. For instance, use scenarios are an appropriate method to be used in the proposed framework but, the rationale of applying them may be quite different. Traditionally, scenarios are prepared to reveal detailed user-interface related issues, whereas in the proposed approach scenarios may cover all levels of analysis from macro to micro level.

Acknowledgements

This work is funded by the Finnish Funding Agency for Technology and Innovation (Tekes)

References

- [1] Wikipedians 2013. Early Home Computers. PediaPress. Retrieved 11/1/2013 from [http://en.wikipedia.org/wiki/Book:History_of_Home_Computers]
- [2] Pantzar, M. 2010. Tulevaisuuden koti: arjen tarpeita keksimässä. Helsinki: Otava.
- [3] Harrison, S., Tatar, D., and Sengers, P. The three paradigms of HCI. In Alt. chi. Proceedings of CHI '07. ACM Press, NY, 2006.
- [4] Oulasvirta, A., Kurvinen, E. & Kankainen, T. Understanding contexts by being there: case studies in bodystorming. *Pers Ubiquit Comput* 7(2), 125-134, 2003.
- [5] Buxton, B. Sketching User Experiences: Getting the Design Right and the Right Design. San Francisco (CA): Morgan Kaufmann, 2007.
- [6] Loke, L., Larssen, A. T., Robertson, T. & Edwards, J. 2007. Understanding movement for interaction design: Frameworks and approaches. *Pers Ubiquit Comput* 11: 691-701.
- [7] Dourish, P. 2001. Where the Action Is: The Foundations of Embodied Interaction. Cambridge (Mass.): MITT.
- [8] Baker, A., Besana, P., Robertson, D. & Weissmann, J. B. 2009. The benefits of service choreography for data-intensive computing. Conference paper, CLADE'09.
- [9] Parviainen, Jaana. 2010. Choreographing resistances: Kinaesthetic intelligence and bodily knowledge as political tools in activist work". *Mobilities* 5(3): 311-330.