
When Swipe Is Not Just a Swipe: On Explicating the Qualities of Movement for Gesture Design

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Abstract

As the use of gestures and other forms of body-based control in human-computer interaction is increasing, it is relevant to take a look at the ways that body movements are conceptualised in interaction design. In this paper we argue that, in addition to outlining gestures as general types of action (e.g., swipe), an equal emphasis should be put in particularising and describing the way in which the action is performed. Some existing approaches and practices for explicating this 'felt essence' in the dynamic qualities of movement are outlined and discussed.

Author Keywords

gestures, interaction design, movement, notation

ACM Classification Keywords

H.5.2 [User Interfaces]: Theory and methods.

Introduction

One of the growing challenges of interaction design relates to appropriate usage of body-based, gestural controls in user interfaces. A part of this challenge is in creating controls in which body movements feel natural and avoid being too mechanistic. The recognition that cognition is embodied action [1] brings forth the fundamental idea that human actions are embedded with a range of situated, tacit meanings which cannot be overlooked in

gesture design. In fact, it could be said that every move we make manifests intentionality that we live through our body [6]. And even the smallest nuances and dynamic changes in those movements – i.e., the way the movement is actualised – manifest the type of felt meanings often referred as vitality affects [11]. The importance of these implicit meanings is emphasised by the recognition that they relate to the first means we form knowledge of the body and the world we are living in [10, 11, 3].

In terms of Laban's movement analysis (LMA, see [4]), the domain of felt meanings, the 'inner attitude' and intentionality relate to the category of movement called *Effort*. All body movements have the effort-element, which manifests in body's shaped configuration in space and in the procedural qualities of movement. Even in case of a specific type of action, such as a swipe of the hand, the effort can be different (thrusting, sliding, stroking, slashing, and so on). As these qualities of body movement are coupled with intentionality directed to the environment, it is important to acknowledge that the details of motion are equally relevant to both the felt and the functional essence of the movement.

We argue that in designing gestures, mere outlining of them as general types of action is insufficient. An equal emphasis should be put in particularising and describing the exact way (and intention) in which the action is performed. Even definitions of shape and direction of the body movement needs to be coupled with more detailed descriptions of (contextually motivated/justified) movement qualities and the precise effort of action. Next, we review and discuss some practical approaches and methods for explicating such details in design documentations.

Explication approaches

Verbal descriptions

One of the most straightforward ways of explicating and communicating the particularities of movement is trying to describing them verbally. It almost seems self-evident that careful choice of words in conceptualising and sketching gestures can indeed convey lots of details of the intended movement, its effort and the dynamic experience attributed to it. For example, words such as thrusting or sliding may be used as a qualitative attribute to the swiping gesture in question. One could say that the problem of verbalisation is that the movement details remain fuzzy due to the interpretation required. However, the interpretation of action-related words are not necessarily far separated from the experience of concrete actions [3], and it may even involve enactive or ideomotoric apprehension of the activity referred in the word [2]. All in all, conceptual design should consider systematic, deliberately rich use of verbal expressions in describing the explicit dynamic attributes of an intended gesture.

Analysis of effort

Outlining a specific effort involved in the intended gesture should give support to the conceiving of its particularities and qualities as a bodily action. In Laban's terms [4], effort describes simultaneously the intention of the movement within its affection and intensity. For instance, in swiping gestures of either *thrusting* or *sliding* type, the control of the movement, the strength of the movement and the timing of the movement are very different. Effort has four subcategories (Effort Factors), each of which has two opposite polarities (Effort Elements). Effort factors and the respective polarities are shown below:

- **Space:** Direct vs. Indirect (Flexible)
- **Weight:** Strong vs. Light

- **Time:** Sudden vs. Sustained
- **Flow:** Bound vs. Free

For instance, thrusting something away is a determined act, in which the movement of arm is usually *direct*, *sudden* and *strong*, while in sliding action the moving arm is *sustained*, *light*, *direct* and *bound*. Different combinations of effort elements thus effectively characterise different movement qualities and the related types of action.

Notation and illustrations of movement

In addition to verbal descriptions and categorical analysis, there is usually a need to visually illustrate the intended movement. Graphical descriptions of movement can be effective, as they may iconically as well as indexically refer to the actual structure and/or the process of movement. Different types of *ad hoc* illustrations of gestures are common in design documentations (see Figure 1), but while they are intuitive they often lack in terms of describing movement qualities (i.e., how the movement is performed). Moreover, they are usually not well suited for illustrating flows and rhythms of movement that goes beyond a single move of the body. For that, designers can use movement notation systems, such as Labanotation which is a close equivalent to musical notation in many respects. As being a comprehensive body-centered notation system Labanotation clearly has much to offer in body-based interaction design (see, e.g., [5]), but it also its drawbacks. The highly symbolic and formal nature of notation means that the felt essence of movement may not be that intuitively perceivable.

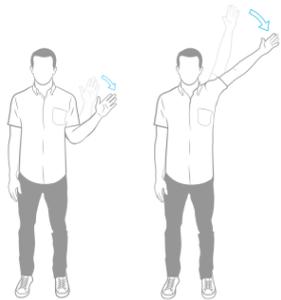


Figure 1: Typical illustrations of hand gestures (from Kinect Human Interface Guidelines [7]).

Bodily sketching

Design practices for body-based interaction almost certainly involve at least some kind of formal or informal

bodily experimenting (i.e., *bodystorming*, see [8]) with regards to gestures, their form, function and situational appropriateness. This kind of enactive sketching of body movements allows tacit utilisation of 'kinaesthetic thinking' [12] that goes beyond the reflective (cerebral) design conceptualisations. During *bodystorming* sessions, it makes sense to produce manually performed sketches of body movements, that appear experimentally appropriate both in terms of function and feeling. Different means can be utilised for recording the performance, and as a further step, for extracting dynamic envelopes that explicate certain aspects of movement qualities.

When sketching a gesture it is essential to acknowledge the situational context as well as the related intentionality of the act. In that way, sketches of movement should physically manifest contextually appropriate motor intentionality embedded in our spontaneous body actions (see, e.g., [13]). Moreover, sketching may also involve use scenarios that put the single swipe of the arm into the larger continuum of bodily choreographies [9].

Concluding statements

In this paper we proposed justifications for putting more emphasis to describing the particularities of movement and its felt qualities in designing gestures. On the basis of the brief review of some practical methods for explicating those qualities in design, the key for utilising these approaches seems to lie in finding out a balanced combination of them all to be used in different phases of design. Still, it also seems that a strong need remains for developing a specific movement notation system, suitable for interaction design.

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