
Working paper.

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Abstract

The discussion that follows is on the use of theatrical modelling to develop a design protocol where expressive gestural human-computer interaction can proceed in a coherent and continuous manner. The focus is on the processes by which actors and directors manufacture repeatable gestural expression in theatre. Critical to the success of its application in human-computer interaction is a workable definition of gesture. An example of the design process application and evaluation is demonstrated in the interactive gestural film game To be or not to be [http://www.Betaspace.Net.Au/Content/View/36/].

1.0 Introduction

Full bodied human-computer interaction brings the gestures of the human body to the forefront of interaction design [1, 2]. Interpersonal communication – otherwise known as body language - is complex and does not readily adapt itself to design processes and outcomes [3]. A method by which to simplify the nature of gestural actions for the purpose of human-computer interaction is essential to design effective experiences from both a human and technological perspective.
2.0 The Problem of Gesture.

There is much evidence that indicates that gestures play a significant role in face to face communication [4]. One only needs to visualise an individual who walks into to a room slouching to know that this posture may indicate a range of non-vibrant emotions such as sadness or depression. Similarly a brisk hand movement may indicate confidence or may be merely incidental. Having said this, the interpretation of gestures in everyday conversation may be ambiguous as there is no strict ‘grammar’ of gestures [5].

It was Bolt’s landmark design ‘Put That There’ [6] that first showed that a combination of gesture and voice input prompts could be used effectively in a multimedia system. The result was a deictic, that is pointing system, that responded to commands as the title suggests, to ‘put that there’. Since, there have been numerous attempts to further engage human communication within multimedia systems. The design complexity demanded by the task is characterised by the number of varied definitions that exist for gesture. What in fact then, is a gesture?

First, a working definition of gesture will be established. Secondly, the perspective adopted will be to look at gesture formation processes used in theatre [7, 8] and to adopt this to the interactive design process. In theatre, gestures and associated emotions are manufactured for communication to audiences; it is therefore ideal as a model for gesture generation because the result is repeatable and controlled as an artefact for performance.

3.0 Full Body Gestures: a Definition.

In the literature on gestural human-computer interaction there is little agreement on what actually constitutes a gesture for the purposes of design [9]. The lack of a clear definition poses a significant problem for the designer in that the nature or components of bodily movement to be integrated are unclear.
Gestural artists, and that includes dancers and actors, have specialised approaches to generate expressive gesture [10]. One technique often employed by actors to generate and ‘fix’ gestural expression within the art form is to use the practice of yoga, an ancient form of bodily exercise. In theatre it is used to generate or to begin the definition of an expressive grammar for performance purposes. Yoga is the foundation by which many of the principles by which dancers also work at the bar, strengthening and stretching limbs to maximise the range, power and control of gestural expressiveness [11]. Theatre directors such as Grotowski [12] were well known for their use of yoga postures in rehearsal so that actors would be fully engaged in gestural process in performance.

Yoga then offers a view into the components of controlled gesture formation for the purposes of expressive communication and will serve to form a working definition of gesture. Concepts from photography [13] will be used simultaneously, making the definition applicable to media used in interactive systems design.

4.0 Theatrical Modelling.

Theatrical art is highly useful in that it creates aesthetic paradigms through which gestural expression can be constructed. The performance seen on Tuesday evening of *Hamlet* will have mostly the same pattern of gestures communicating usually the same emotional message as the performance on Saturday. The discussion to follow will examine the processes by which directors and actors are able to transform the characters inscribed in the script of the text into live performing characters who gesture and have established emotional expressiveness in performance. The perspective will focus on the transformation of media processes that occur in the performance construction process, forming a model.
5.0 Concepts: Applied and Evaluated.

The discussion will then continue to describe the application of the theatrical model to make an interactive gestural film game, *To be or not to be* [14]. The interactive experience was designed so as to measure both gestural and emotional responses by the users whilst consciously creating a motivating and coherent user experience. As such, the application of the theatrical model along with the developed definition of gesture, are effective approaches in expressive gestural human-computer interaction design both in terms of generating gestural and emotional interaction and evaluation of the experience [15].
Bibliography


  http://www.youtube.com/watch?v=jKNvSpXG0Z0