

# Chapter 24

## Gestural Motivation, Learning and Evaluation using Interactive Game Design

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### ABSTRACT

*Emerging game interface design increasingly incorporates human gestural learning. Electronic gestural games, when effectively designed, offer high levels of user engagement. The chapter to follow presents theatrical practice, an art form that manufactures expressive gestures in set paradigms, as a model for gestural game systems design. A rigorous definition of gesture is first developed from yoga practice as an exercise for performance preparation, emphasising the gesture as a still form executed within a narrative context. The theatrical model is then refigured into an interactive gestural film game design, *To be or not be*, based on a section of text from Shakespeare's play *Hamlet* (Danylak & Weakley, 2007). Evaluation of gestural learning is integrated into the system. The focus is on the generation of the physical aspect of the gesture as a movement.*

### INTRODUCTION

#### The Approach: Gestural Interaction using Theatre as a Game Model

The approach adopted uses text-based theatrical performance process as a model, refigured into an interactive gestural film game. Theatre is particularly well suited as a model because it has distinct developmental phases that eventually generate

performed gestures in set paradigms and can be described as *text*, *rehearsal* and *performance*: the *text*, is in the form of a script written by a playwright, describes an imagined world of characters gesturing and talking and forms the blueprint of gesture and dialogue performance; next, there is the *rehearsal*, where directors and actors bring the textual world of the play onto the stage, interpreting how the characters should speak and move, building the play through gestural and speech reiteration following the text; and finally there is the *performance*, the fixed patterns of gesture and

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dialogue that make the theatrical work of art, the play, usually repeated as several performances. These three process elements – text, rehearsal and performance – are refigured into an electronic game format, appearing in a non-sequential manner to generate gestural learning as a game goal. From a gesture learning perspective, the design has three main characteristics. These are:

- a capacity to generate gestures
- a capacity to create continuity of user experience
- a capacity to capture the performed gestural data by the system for learning evaluation

### **Game: A Definition**

A game may take many forms. In popular usage, if one was to say ‘let us a play a game’, then we would most likely understand that there is some tactical goal to achieve with there being an outcome of a single or team winner, the process including elements of probability. We would most likely expect to be amused in the process and that some sort of skill maybe tested or acquired. There, are of course, solitary games. In the discussion to follow ‘a game’ will mean probability-based play marked by the presence of a linear narrative within a technological interactive process (Frasca, 2007) (Schell, 2003). In following this definition an interactive game shows both a linear, story telling process, which can be cognitively apprehended, coupled with the unknown, probability-based outcomes, managed by computer program automation.

The word ‘game’ originates from Old English Word ‘gamen’ and is best contextualised as meaning ‘fun’ or ‘amusement’ (Dictionary, 2005). Game theory from a mathematical perspective is well developed; Von Neumann, who played a leading role in the evolution of modern computing in the decade of the 1950’s, focused on game theory consistently in his work (Kuhn, 1997). Interactive games form an international industry that

produces thousands of titles annually (Chesher, 2004). Such games as Sony’s Eyetoy (Demming, 2004) are interactive games that use computational systems that respond to gamers’ movements. The Wii (Schlömer et al. 2008) has also evolved an interface mostly of sporting narratives that allows gamers to engage in various competitive outcomes. The nature of gestural interaction included in game processes is increasing and has applications in a wide range of human functional and commercial activities that are extended or enhanced through computational interaction.

## **PART I: THE GESTURE**

### **Obstacles and Potentials of Gestural Human-Computer Game Interaction**

Bolt’s (1980) work *Put That There*, was the first instance of demonstrating a practical outcome of gesture-based technology, combining voice response commands with deictic (pointing) instructions enabling movement of objects on a video screen. Hence, the potential of gestures as input in multimedia interactive systems became a matter of significant interest owing to the fact that when humans communicate in face-to-face interaction, gestures often communicate emotional states and associated intentions. The challenge was how to purposefully integrate gestures into an interactive system where coherency and continuity of an interactor experience could be created and measured.

From a design perspective, to isolate the gesture and to use the data in a constructive useable manner is problematic owing to the complexity of gestural communication. The variety of interpretations as to what constitutes a gesture amongst technology researchers is vast and varied, illustrating the fact that gestures are complex. Cadoz and Wanderley (2000) in a survey of gesture definitions used by researchers and artists in gesture technologies show great diversity, with no clear grammar for

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