



StillDancing: Interacting Inside the Dance

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ABSTRACT

StillDancing is a system in which a participant's physical whole body movement defines interactions with a 3D graphical movement composition system. The Ascension Technologies *Flock of Birds*, a six degree of freedom motion capture system, will provide input to LifeForms [1,2], a computer choreographic design tool for human movement. A participant is able to select their own movement samples displayed in real time and projected in a life-size scale, and also to use other characteristics of their gesture to provide a mechanism to compose and position themselves within an ongoing dance created from movement images and the collective movement of other participants who "enter the dance" during CHI 94.

KEYWORDS: User Interface Design, Motion Tracking System, Gestural Interface, Dance, Choreography, Human Animation, Interaction, Input Devices, Virtual Reality, Composition, Design.

INTRODUCTION

StillDancing is a system in which a participant's physical movement defines interactions with a 3D graphical movement composition system, including what and how movement is displayed. LifeForms[1,2], a computer choreographic design tool for human movement will be connected to the Ascension Technologies *Flock of Birds*, a six degree of freedom motion capture system. A participant, wearing the *Flock of Birds* motion capture system, is able to select their own movement samples displayed in real time and

projected in a life-size scale, and also to use other characteristics of their gesture to provide a mechanism to compose and position themselves within an ongoing dance created from movement images and the collective movement of other participants who "enter the dance" during CHI 94.

Projected movements (output in real-time from the computer system directly onto a large projection screen) are represented and mediated by the StillDancing system. By moving, participants interact with their own projected images, replicate those images, and encounter and respond to memories of their own movement as well as memories of other participants' projected movement, others StillDancing virtually in the system.

USE AND RELEVANCE TO HCI COMMUNITY

StillDancing incorporates whole body and gestural input, utilizing a non-traditional motion capture input device along with an innovative interface design. The movement of the participant is *literally* sampled and displayed, and is *metaphorically* treated to influence, direct, and determine what is presented and represented visually. The result is an immersive participatory environment, in which what is seen and experienced has an immediacy which affects interaction and creation. The LifeForms computer choreographic system is designed with a sophisticated degree of compositional feedback which takes into account creative interaction with a movement idea and design components for the representation of movement. What was previously accessible only through *synthesized* movement phrases, can now be accessed and explored with real-time *sampled* movement phrases input directly from the CHI 94 participant.

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Movement captured in this way can take advantage of the same underlying design and organizational elegance in representation and feedback that LifeForms provides.

At this time, LifeForms is typically used by people who are trained choreographers, directors and movement performance artists. In all likelihood, the average CHI 94 participant is not extremely literate in movement composition nor highly refined in their physical skills or motor memory. Yet exposing them to composition as a task is of particular interest in this installation: StillDancing provides immediate access to the experience of the body as gesture, as movement and as compositional guide in an evocative and playful environment [3]. This is accomplished neutrally and simply by having a participant move around in space, thereby enabling them to increase their awareness of their own movement and compositional skill.

In addition, StillDancing, provides a unique type of group interaction: its "Same Place /Different Time" approach is one in which many participants can enter the dance, one at a time, leaving their movement artifacts images and memories behind for one another to recall, reconstruct and re-experience.

SYSTEM COMPONENTS

StillDancing is an interactive real-time input interface software which links data captured from Ascension Technology's *Flock of Birds* to LifeForms Choreographic Software. The system on display at CHI'94 Interactive Experience runs on an SGI Indigo Extreme, and utilizes a high-resolution video projector connected to the Indigo to project life-size images onto a large video projection screen.

THE INTERACTIVE EXPERIENCE

A participant enters **Inside the Dance** by attaching the motion capture system to the body. This is comprised of six small (one inch square) extremely light weight hardware transmitters, attached to resizable 1/2 inch elastic strips which are placed at the wrists, and ankles, attached with a belt at the waist, and with a lightweight headband or hat on the head.

The participant wearing the 3d tracking system would move, selecting points in time that the system would begin to remember (or sample) the movement phrases. As the participant moved, the image of their movement would appear, projected in life-size scale in front of

them on the projection surface. Movement gestures would enable a selection of replicated movement memories (samples), both from the participants memories and from the collective memories of movement samples left behind by previous participants StillDancing. Gestures would enable the participant to compose their own place within the dance, modify timing and placement of visual images, and select and integrate movement phrases. This experience reflects notions of identity with ones own multiple selves, with illusion created by immersion inside the dance, with an experience of the body itself as gesture and knowledge, and with impulse and imagination embodied by choreographic play.

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REFERENCES

1. Tom Calvert et al, "The Evolution of an Interface for Choreographers", *Interchi '93 conference Proceedings*, 24-29 April 1993, pp 115 - 122.
2. T. Schiphorst et al, "Tools for Interaction with the Creative Process of Composition", *CHI '90 Conference Proceedings*, April 1990, pp 167 - 174.
3. T. Schiphorst et al, "The Shadow Project: An Exploratory Workshop in Performance Technology", *The Fourth Biennial Arts & Technology Symposium*, March 4 - 7 1993, pp 132 - 142.