InterPlay: Performing on a High Tech Wire
(Collaborative, Real-Time, Distributed, Surrealistic Cinema)

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Introduction

Abstract

Through the investigation of five *InterPlay* performances, this paper will describe the form and discuss its process and structure. It will analyze some of the issues that have been encountered, surmounted and those that require continued examination. It will also discuss subjects such as distributed collaboration, communications, production elements, real and virtual venues, and the layered development of works within this innovative art form.

InterPlay

InterPlay is a multifaceted, real-time, collaborative digital performance event that occurs simultaneously at multiple sites throughout the world. Artists and technologists from several institutions synchronously perform and collaborate in real time, utilizing media and technologies of various forms, such as Access Grid®, streaming digital cinema and audio, computer animation, remote MIDI control, motion capture, and interactive distributed virtual reality.

Electronic and acoustic musicians, dancers, actors, digital graphic artists, virtual reality designers, video artists, motion control engineers, a variety of technologists and others come together, integrating their ideas into this large scale distributed performance. Each site generates two or more video and audio streams then transmits them onto Internet2. At the host site, these video streams are collected, processed, combined into the digital mix and then transmitted back onto the network. This multimedia content is integrated with each site's local live performance, creating a live distributed cinematic performance event.

The Process and Structure

Distributed Collaboration

The *InterPlay* begins with an artistic concept as a foundation for all participants to build upon. Artists and technologists at each site create a performance based on their particular discipline and technological infrastructure. The host site guides, directs and assists the participants in the development of each site's creative contribution in order to be able to integrate that work into the entire event.

The host site is responsible for the execution of the entire project. This includes scheduling weekly distributed video conference meetings, testing new technologies and integrating them into the project, network trouble-shooting, systems support, daily communications, overall publicity, documentation, rehearsals, direction and post production.

The coordinators of the participating sites are responsible for all local creative and technological contributions to the project. They work closely with their regional artists and technologists, schedule meetings and testing sessions; monitor creative and technical progress; generate local publicity and other activities.

Production Elements

The technological tools used during the *InterPlay* performance are crucial. Professional video cameras, hi-fidelity microphones, computers, lighting design, and a detailed layout of the performance space are utilized to provide high quality content. A team of creative technicians is necessary minimally this includes a node operator, a lighting technician, a camera operator and an audio engineer. Communication with the site's network personnel is essential and some understanding of the backbone network topology is helpful.

During performances, the camera is a portal into the artist's world. Awareness of the quality of the streamed video and its framing is imperative. Providing useful content is achieved by having knowledge of camera technique and effective lighting. Regardless of the quality of each site's live performance, if it is not visually comprehendible through the camera, then the work is lost within the scope of the *InterPlay*. Providing high-quality visual imagery is important even if the main content supplied by the participating site is audio. Some considerations include close, medium or wide shots to produce compelling imagery that can enhance the overall *InterPlay* production.

Lighting and audio design is critical for an interesting and technically executed performance. Each site's local performance needs a lighting plan that encompasses both a well-lit theatrical design for their live audience and a cinematic lighting design for the camera to benefit the network audience.

Providing high-fidelity audio is a primary component and the most pronounced challenge of working within this form. There are many components in the audio design that can malfunction and troubleshooting such problems is complex. The checklist can include an echo canceling system, audio transmission software, a sound card's mixing components, or local and remote sound systems.

Communications

The *InterPlay* form is built upon an infrastructure of IP based telecommunications. The level of communication necessary to create a coordinated piece over long distances is extensive. Constant communication with all participating sites is crucial to the success of the production; this process consists of videoconference meetings, telephone, email,

wikis and web blogs. In order to coordinate and develop a project, no single form of communication is sufficient in this collaborative process.

Another Language utilizes the Access Grid technology for telecommunications and performance activities although the Access Grid is a communications tool; additional modes of communication are necessary. For example, to create a fully-integrated piece such as *InterPlay: Nel Tempo di Sogno* (2007), three or four meetings a week with individuals and groups, telephone calls, web blogs, as well as more than five hundred email messages were required to coalesce the six participating sites.

Rehearsals

InterPlay rehearsals include individual site testing and experimentation, then there is a progression into multiple site rehearsals. Scheduling involves the coordination of local and remote teams. This requires awareness of the time zone differences and the schedules of each site's participants. Differences in time zones can result in confusion, so it is helpful if the schedule specifies the appropriate times for each zone.

The rehearsals function as test sessions and technical trials, where performers interact with the technology. These preparations are critical in determining what technologies can be incorporated into the project. This is the time for troubleshooting multicast network issues; testing and integrating software and hardware development, utilizing new audio-video streaming systems, adjusting human-technology interfaces and researching other emerging technologies.

Performance Venues

Performance venues exist in two forms, the physical and the virtual. The physical performance venue is the space that houses each site's live performance and audience in attendance. The virtual performance venue is the place where the Internet viewer can experience the performance.

There are very few traditional performance venues that have the cyber infrastructure required to support an *InterPlay* event. In Utah, Another Language Performing Arts Company presents in the lecture hall of the Intermountain Networking and Scientific Computation Center (INSCC) at the University of Utah (UU). Other examples are the University of Illinois, Chicago has showcased their work in the Electronic Visualization Lab and at the University of Alaska, Fairbanks the physical venue is the Discovery Lab at the Artic Region Supercomputing Center.

Figure 1. *InterPlay: Loose Minds in a Box* Mixed Stream; Dancer Joe Hayes Inside The Box

For the Internet audience the Access Grid technology provides the best view of the *InterPlay* event with its multiple video and audio streams. The viewer is able to see all simultaneous content, including the digital mix. A live QuickTime stream of the digital mix is also available on Another Language's web site, www.anotherlanguage.org/interplay. During the 2007 InterPlay performance an uncompressed, thirty megabit-per-second, digital video stream using the Digital Video Transport Systems (DVTS) was provided. This video stream was only available to users that connected through professional or educational facilities with the appropriate bandwidth and infrastructure.

Technology and Network Infrastructure

Jimmy Miklavcic with the assistance of Sam Listen at CHPC adapted the Access Grid technology for use as a performance system, modeling the venue server, *artgridvs.chpc.utah.edu*, to mirror a theater space. The goal is to one-day map the virtual theatre to physical theatrical spaces, connecting components of several theaters into a large collaborative network. The virtual lobby has access to the Black Box, Café, Studio_1, Studio_2, and the Theatre. Through the Theatre there is access to the Back Stage, Green Rooms, and other virtual areas.

The Access Grid software is scalable and can operate on a single laptop or expand to a larger Enhanced Performance Grid. The Enhanced Performance Grid is an environment of various systems that, together, supports the *InterPlay* event. It consists of streaming, broadcast, display, video-capture, recording and venue servers, an audio control system, streaming collectors, video effects processors and text-chat systems. Taking into account, all the participating sites, a highly distributed heterogeneous computational environment is created.

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InterPlay Performances

Another Language Performing Arts Company, in partnership with the University of Utah's Center for High Performance Computing (CHPC), has produced five *InterPlay* projects in collaboration with eleven institutions and research labs across North America for more than five years. The following project descriptions will highlight many of the structural concepts of the *InterPlay* process.

InterPlay: Intransitive Senses (2003)

InterPlay: Intransitive Senses, premiered on April 19, 2003. It incorporated four performance streams from four locations on the first floor of the INSCC building. This prototype project provided an opportunity to understand the constructs needed to expand the collaboration process to the Internet. Directed by Jimmy Miklavcic, this *InterPlay* included four simultaneous performances in three separate locations by the five artists, Elizabeth and Hanelle Miklavcic (performance artists), Flavia Cervino-Wood (violinist and performance artist), Harold Carr (bassist and poet) and Alex Caldiero (poet and sonosopher). A camera operator was assigned to each performance location in the building and the corresponding video feeds were mixed, processed and transmitted on the Internet.

Figure 2. Video still from *InterPlay: Intransitive Senses*
Pictured: Flavia Cervino-Wood, Alex Caldiero

Intransitive Senses was an investigation that concurrently tapped into four simultaneous performances and processed the video streams as *found objects*. The overall goal was to weave a distributed tapestry of kinetic imagery.

InterPlay: Intransitive Senses was performed a second time for the *Symposium in Science and Literature* at the University of Utah on October 10, 2003. Artists for this performance were Sam Liston (guitarist), Kate Macleod (violinist), Alex Caldiero, and Elizabeth and Hanelle Miklavcic. In this performance, Elizabeth and Hanelle's

performance of was placed on a different floor to simulate a remote site and test the reliability of video, audio and communications over a longer distance.

InterPlay: Hallucinations (2004)

InterPlay: Hallucinations debuted on April 23 - 25, 2004. This performance, for the first time, incorporated remote sites; the University of Alaska, Fairbanks (UAF) and the Arctic Region Supercomputing Center (ARSC) with artist Miho Aoki (computer graphics), Scott Deal (percussion) and Paul Mercer (technologist); the University of Maryland (UMD) with artists Nadja Masura (video) and Brian Buck (dance); and Another Language Performing Arts Company at UU.

Figure 3. Video still from *InterPlay: Hallucinations*
Pictured Mary Larimer, Brian Buck

Hallucinations explored various types of social, commercial, and political hallucinations. Each site interpreted the concept through several different performance and media forms. Artists from UMD investigated the commercial and political brainwashing in our daily lives through dance and video, UAF investigated the delusion of communication through music and computer animation and UU dealt with social hallucinations through computer animation and theatrical performance.

InterPlay: Loose Minds in a Box (2005)

InterPlay: Loose Minds in a Box was performed March 31 – April 2, 2005. Participating institutions included UAF and ARSC; University of Montana (UMT), UU, University of Illinois, Chicago (UIC), Purdue University (PU) and the Envision Center for Data Perceptualization (ECDP), and the UMD.

This *InterPlay* explored aspects of multiple personalities or schizophrenia. Approached abstractly the concept allowed for a broad interpretation of the psychological theme. The performance structure was divided into six scenes that featured different artists and

technologists individually or in groups of two or more sites. Miho Aoki (UAF) developed a plan to represent each scene by color. From this, a dramaturgy was developed to organize the progression through the scenes. Each scene contained a different background design and geometrical arrangements of the live video windows. These were placed in real-time by the node operator to evoke a dynamic kinetic progression of the cinematic screen display.

Figure 4. Composite video still from *InterPlay: Loose Minds in a Box*
Pictured: Elizabeth Miklavcic (Utah) and Joe Hayes (Purdue) in the virtual environment.

Timothy J. Rogers (PU), a motion capture engineer worked with dancer Joe Hayes (PU) and choreographer Carol Cunningham (PU) to map and translate the dancer's movements into MIDI data that was transmitted to the other sites, controlling audio and video processing. Dioselin Gonzalez (PU), a virtual environment engineer developed a software module for the Access Grid called AG Juggler. This program allowed audience members at all participating sites to manipulate avatars in Purdue's visualization lab. Miho Aoki (UAF) and David Sigman (PU) created the 3D graphics for the virtual environment.

The final *InterPlay*: *LMIB* scene featured Charles Nichol's (UMT) recordings of *The Blue Box* haiku, written by Nadja Masura (UMD). He created an interactive composition that was manipulated by dancer Joe Hayes (PU). Recorded readings of the haiku by Dwight McKay (PU), Tina Shah (UIC), Nadja Masura (UMD), Jimmy and Elizabeth Miklavcic (UU) were processed through MAX/MSP and controlled by Hayes' movements at PU. Timothy Rogers captured the X and Y coordinates of Hayes' movements and converted them to MIDI control parameters. This data was sent over the

Internet to UMT, using a transport program written by Rob King and facilitated by Many Ayromlou from Ryerson University in Toronto, Ontario, Canada.

InterPlay: Loose Minds in a Box was performed again for SIGGRAPH 2005 at the Los Angeles Convention Center on August 3 – 4 and for Supercomputing Global 2005 in Seattle, Washington on November 17.

InterPlay: Dancing on the Banks of Packet Creek (2006)

The March 31-April 2, 2006 *InterPlay: Dancing on the Banks of Packet Creek* concept addressed the rising trend of tenuous devotion towards the inundating wave of digital information and dependence on non-experiential knowledge. *Packet Creek* depicted the Internet with its flow of disassembled pieces of data that course throughout the world like schools of spawning salmon. *Dancing on the Banks* represented the exposed ritualistic gyrations of searching, acquiring, disseminating, creating and believing in this electronic epistemological knowledge. There were five participating sites; UAF/ARSC; Boston University (BU); UMD; PU/ECDP; and UU.
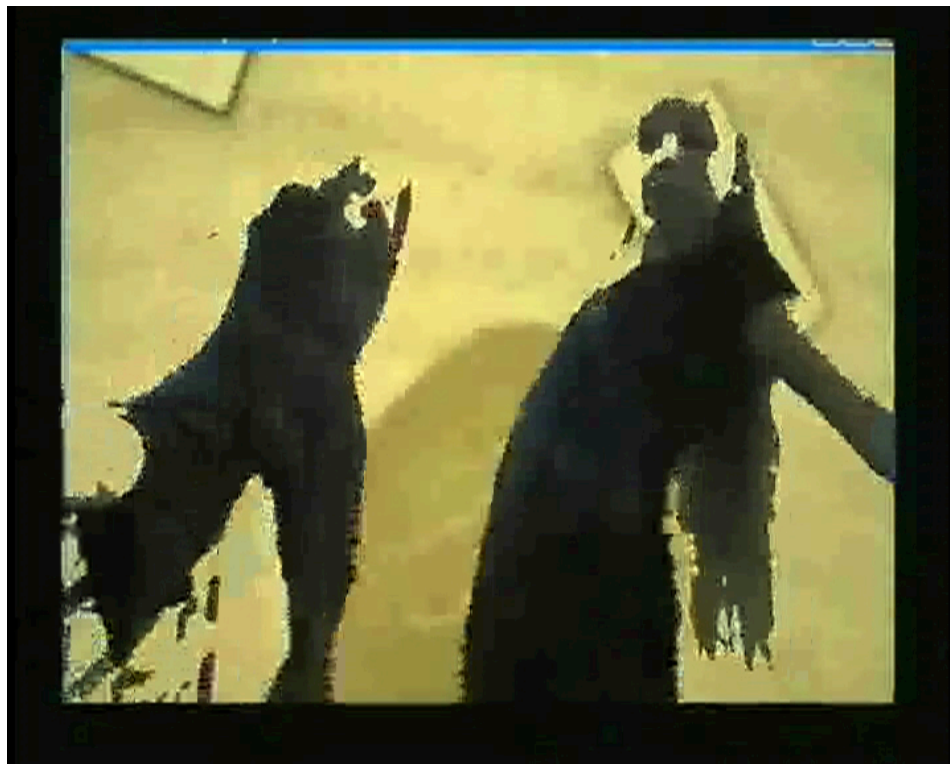

Figure 5. Video still from *InterPlay: Dancing on the Banks of Packet Creek*
Pictured: Joni Uri-Wilson, Alyssa Wilson

The performance began with a video of a simulated Linux system booting up and graphics from UAF. The text of the Linux boot sequence was replaced with a poem by Elizabeth Miklavcic and was arranged to invoke the sense of a beginning, an awakening through a visual introduction symbolizing the ubiquitous transmission of data.

Through ten scenes the artists, musicians and performers forged a slow Bolero style build that came to a complete stop when the *system* crashed. Then the poetic boot sequence engaged once more, representing the never-ending reoccurrence of the process.

The overall theme among all sites focused on the binding concept of the overwhelming and inundating amount of information available to us on a daily basis. The digital mix was placed in the center of the display. It tied the various offerings together by combining different moments from each of the sites. At various moments in the piece, video from all five sites intersected in the digital mix on the main display.

Sam Liston (UU) added a 3D element to the cinematic display; the arrangement of the windows on the scrim defined the visual and kinetic spirit of the overall piece. Each scene was designed to evoke a different quality and the display structure followed a Bolero dynamic, of tension and energy, which built the layered, distributed performance events until, at the climax; all of it ended abruptly.

InterPlay: Nel Tempo di Sogno (2007)

InterPlay: Nel Tempo di Sogno (In the Dream Time) was performed on March 30 – April 1, 2007. Co-directed by Elizabeth and Jimmy Miklavcic, *InterPlay: Nel Tempo di Sogno* was a work of unprecedented integration among sites. It incorporated thirty-two artists and technologists, and six institutions, UU/CHPC, UAF/ARSC, BU, University of Illinois - Urbana-Champagne, UMD, PU.

Figure 6. *InterPlay: Nel Tempo di Sogno* - Photograph: Rusty Kirkpatrick
Pictured: Travis Eberhard and Utah Time Line, On Screen: Peter Rogers

Elizabeth Miklavcic coordinated nine actors from three distributed sites (Utah, Alaska and Maryland) into a cohesive expression examining temporal experiences. A widow from Victorian England mourned the passing of a loved one; a French aristocrat told her horrific experiences living through the French Revolution; a mid-century Cardinal struggled to tend to his flock of believers and a talking tele-evangelical head spouted rhetorical half-truths about the morality of time. Those and others, intersected through different moments in time interacted and communicated with each other as they examined how their lives had slipped through time.

The multi-framed cinematic display incorporated background flash animations by Miho Aoki (UAF) ran behind the various video window arrangements. More than eight video streams of performers, musicians and computer animations were distributed in different groupings across the display.

Figure 7. Chun-Chen Chang and Travis Eberhard in Scene 12 of
InterPlay: Nel Tempo di Sogno

Embedded Performances: Utah Perspective

Within the *InterPlay* form, Elizabeth Miklavcic, investigated the development of layered performance works. In the first four *InterPlays* Elizabeth conceived embedded performances that were integral to the shape of the overall *InterPlay* performances. In *InterPlay: Intransitive Senses*, she created *Tea Party*, for *InterPlay: Hallucinations* she staged *The Surface of Things, InterPlay: Loose Minds in a Box* saw the dual-site concept coordination of *Dressers*, and with *InterPlay: Dancing on the Banks of Packet Creek*, she developed *Mind Waves*.

Tea Party – InterPlay: Intransitive Senses

Tea Party, one of the four simultaneous performances of *InterPlay: Intransitive Senses*, was an embedded performance/installation that depicted a cross generational place of play and sharing within the simple constructs of a tea party. It was a very gentle piece that focused on acceptance, by allowing the tea guests (Elizabeth and Hanelle Miklavcic) to play through the fantasy of color and design.

Figure 8. Hanelle Miklavcic in *Tea Party*

Magical bags were filled with different items and hung from the ceiling. The bags depicted the magic of discovery and once the contents were exposed, they were then explored. The sequence of actions by the partygoers was predetermined, but the conversation and some of the events were left open to improvisation. By the time the tea party came to a conclusion, the whole environment had been transformed by the interaction of the two people spending time together.

The Surface of Things – InterPlay: Hallucinations

The Surface of Things focused on stereotypes of first impressions and assumptions that are in direct conflict with the real personae. The work consisted of a younger man, Opponent A (Aaron Henry), and an older woman, Opponent B (Elizabeth Miklavcic) and a mediating Judge (Tony Larimer). Opponents A and B vocalized assumptions based on outward appearances. They directed video cameras at each other and used the projected video images as ammunition for their misinformed statements. The images were projected on the scrim and hanging sheets of frosted plexiglass. Two full-length mirrors

hung on the walls and a hand held mirror allowed the opponents to examine their own *surface*. The Judge, as an outside observer, recognized the encounter and became the instrument that empowered the two opponents to drop their assumptions and see clearly for the first time.

Figure 9. Aaron Henry, Tony Larimer and Beth Miklavcic in *The Surface of Things*

Flash animations (created by Elizabeth) played during pauses in the exchange. The animations served as an abstract apparition of the inner voice. The *Surface* play served as a statement examining the human tendency to make assumptions. As the play resolved and the opponents became friends, two new opponents appeared with a new judge and the assumption dance began again.

Dressers – InterPlay: Loose Minds in a Box

Dressers was an endeavor to coordinate a specific idea among sites, remote performers from different locations worked with the concept of the restrictions or freedoms of external *costumes*. The structure for dressing began with sedate or normal clothing and worked toward a more outlandish or fantastic presentation.

The premise of *Dressers* was based on readily observable external changes in appearance as indicators into affiliations such as class, status, wealth, intelligence, mental health, etc. The exploration involved a philosophical premise of personalities in constant fluid motion like a lava lamp. Each heat-activated floating bubble inside the lamp represented a personality skill set revealed by external dress which at times morphed, split and combined according to the events of any given moment within the performance.

Dressers was designed to show the evolution of personality through a manifestation of matching the external with the internal, through the process of dressing in different outfits and exploring physical actions influenced by these outfits.

In Utah, Elizabeth explored a variety of characters during the six *InterPlay* scenes. Scene 1, *The Void in the Corner,* she became "Church Lady" sitting in a pew of imagination listening to a sermon and surveying the congregation's myriad of fashion statements. Scene 2, *The Imprisonment of Thought* introduced "Red Bandit" and "Dragon Lady". The red satin costume was a visual and textural experience that affected movement and attitude.

Figure 10. Madeline Unprocessed Image   Figure 11. Madeline Mixed Image

Scene 3, *The Air Inside our Head*, "Madeline" donned a 1970's polyester suit jacket, sky blue lycra modern dance skirt, thick blue mittens, a blue hat and a wool scarf that tied the hat down as if to keep a chilly wind from blowing it off.

Scene 4, *One is None*, focused on imprisonment and deformation where the ceiling and front cameras were mixed together creating a perception that "Masked Witch" was falling through the floor. Scene 5, *How Many Are We?* and *Let Loose the Mind* "Party Crasher" utilized layers of unique color, outlandish sparkle and freedom from restraints for the purpose of joyful expression. Elizabeth was armed with a wonderful silver feathered papier-mâché party hat. It symbolized the conscious choice to free the mind and reveal the concealment of different personalities.

Figure 12. Crone Unprocessed Image   Figure 13. Crone Mixed Image

Scene 6, *The Blue Box*, Elizabeth portrayed "Old Crone" with a maroon velveteen cape and held a carved wooden box. Ending the performance as an aged mysterious crone was a journey, a lifetime in miniature that flashed inside a little world, inside a magic box.

Figure 14. The Southwest Shore of the Great Salt Lake, Utah

Figure 15. The Spiral Jetty at Rozel Point Great Salt Lake created by Robert Smithson in 1970

Mind Waves – InterPlay: Dancing on the Banks of Packet Creek

Elizabeth created a piece about personal and universal explorations of visual spirituality. First, she broke down the words of the *InterPlay* title; *dancing* – movement as expressive spiritual life force; *banks* – the representation of an edge, the place where elements meet and transitions exist, places of magic; *packet* – packets as enclosed matter, or bounded information; *creek* – water, flow, force, life, sensation, reflection, an element that must be respected.

Inspiration came from the Great Salt Lake and an earthwork created by Robert Smithson in 1970, located on the northeast side of the lake. These influences were brought indoors through the building of a Zen garden with images of the Salt Lake projected on a visualization cluster.

Figure 16. K. Bradford and E. Miklavcic tangled in web.

Figure 17. Silhouettes leaving at end of the performance.

A dynamic component of *Mind Waves* was the kinetic building of a string web that symbolized the formation of the World Wide Web and the entanglement of our

complicated lives. Utah performer, Kate Bradford (eight years old) strung the room while Elizabeth Miklavcic constructed the Zen Garden. At BU, Robert Putnam (Access Grid Node Operator), Junko Simons (Cellist) and Jacqueline Combs (Performer), incorporated the web idea into their performance creating a visual connection between Utah and Boston.

This visual effect connected both sites literally and figuratively. It was as if the strings extended across the country. The harmonious musical and visual connections between the textures of Junko's cello and the quiet approach of creating the Zen Garden tied the sites together, creating a quartet between the two sites. In *Mind Waves* the action of filling the room with string was a symbolic representation of the *InterPlay* concept as the performers became more and more entangled in the self-created web.
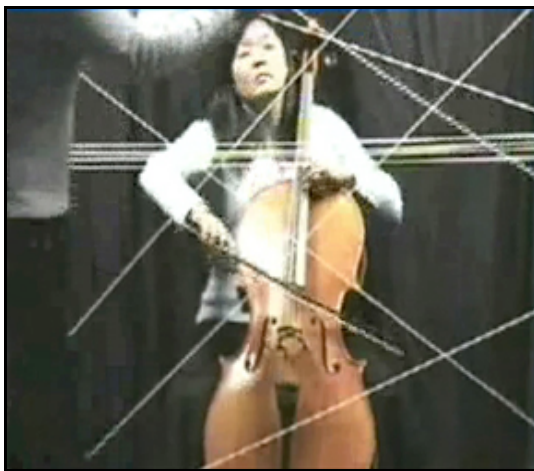
Figure 18. Junko Simons Performing in Boston

Figure 19. Elizabeth Miklavcic Performing in Utah

ENDNOTES:

- *InterPlay: Loose Minds in a Box* was honored as a national semi-finalist for the 2006 Peoria Prize for Creativity.
- *InterPlay: Nel Tempo di Sogno* - Salt Lake City Weekly's *Artys* 2007 Staff Pick - Best Live Real-time Surrealist Cinema

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