

Think Tank Report

"New Performance Tools: Technologies / Interactive Systems"

January 25-27, 2002. OSU Department of Dance

by
Johannes Birringer and Scott deLahunta

PART ONE

Description (general organisation, motivation, participants, websites)

General Organization

The international Think Tank on "New Performance Tools: Technologies / Interactive Systems" was a weekend research laboratory and took place January 25-27, 2002, in Columbus, Ohio, under the umbrella of the new "Interactive Performance Series" in OSU's Dance and Technology program. Its aim was to bring together a small group of professional artists with established practices to explore the practical and conceptual implications of working with interactive tools, instruments and computer-controlled systems within performance conditions and exhibition-installation contexts.

Organized by Johannes Birringer and Scott deLahunta as a collaboration between the Interactive Performance Series (OSU) and Writing Research Associates, the Think Tank was funded primarily by the Office of International Affairs and the Dance Department at The Ohio State University. It was originally conceived of as a follow up to "Software for Dancers: [phase one]", a London-based action research project organised in Autumn 2001 by Writing Research Associates in collaboration with the Arts Council of England, Sadler's Wells Theatre and Random Dance Company. The London project was set up to develop concepts for new software rehearsal tools to support and augment the choreographer's creative process (more information can be found on <http://huizen.dds.nl/~sdela/sfd>). However, over time, the OSU Think Tank evolved less as an explicit follow up to the London-based project, and more as a parallel initiative in North America, with links to South America.

The Think Tank was structured as an intensive three-day research laboratory that included presentations, various discussion formats, practical working sessions and public exposures. While involving individuals at different stages in their careers, there was no separation between 'students' and 'teachers', and all learning took place in the context of peer-to-peer exchange. The international selection of invitees came from a diverse range of backgrounds: electronic music, the visual arts, dance and performance art, computer science and engineering, interactive/ digital media and installation art.

Motivation:

Digital media, evident for some time now in contemporary art and popular culture, challenge our customary perceptions of dance and performance. They necessitate **new platforms** for experimentation and new forms of interdisciplinary collaboration.

The setting for the Think Tank opens a space for conversation, the starting point for these new platforms. Dance, movement research and body-based systems of technique meet

interface design, interactive systems, 3D visualization or immersive data environments, virtual world and other generative system designs. Choreographers, dancers, composers, media and installation artists exchange notes with programmers, engineers, and architects. Writers and curators talk to DJs and cognitive psychologists.

Opportunities for learning about creative applications of digital technologies in dance and performance and for developing individual approaches and aesthetics are still rare, and stronger partnerships between choreographers, musicians, engineers and software programmers but also with practitioners from the communications and social science fields need to be forged in order to further our understanding of the physical, cognitive, and social dimensions of interactivity.

Participants:

Marc Ainger (OSU, Columbus)
 Curtis Bahn (Interface, Rensselaer Polytechnic Institute, Boston)
 Mark Coniglio (Troika Ranch, New York City)
 Kelly Gottesman (OSU, Columbus)
 Tomie Hahn (Interface, Boston/Tufts Univ.)
 Lali Krotoszynski (São Paulo, Brazil)
 Liza McConnell (Columbus)
 Bebe Miller (New York/OSU-Columbus)
 Axel Roesler (OSU, Columbus)
 Sarah Rubidge (Chichester, England)
 Robbie Shaw (OSU, Columbus)
 Dawn Stoppiello (Troika Ranch, New York City),
 Iris Tenge (Frankfurt Ballet, Germany)
 David Tinapple (OSU, Columbus)
 David Tonnesen (FoAM-Starlab Belgium/California)
 Dan Trueman (Interface, Colgate Univ.)
 Todd Winkler (Brown Univ., Providence, RI)

After the event was publicized, four additional participants asked to attend and observe the proceedings: Marlon Barrios-Solano (OSU, Columbus); Oles Protsidym (McGill Univ., Canada); Mitchell Tsai (UCLA, California); and Gary Lee Nelson (Oberlin, Ohio). Anthony Bowne (Laban Center, London) also attended the final sessions as an observer.

Johannes Birringer's role was the local and conceptual organization of the event, Scott deLahunta acted as research and process advisor for the project. It was announced on a project website and in Internet postings to the international community. A live video stream from the lab took place Saturday evening, 7-8 pm EST, and the local public was invited to attend an open "Round Table" at the conclusion of the workshop, on Sunday, January 27.

Project Websites:

<http://www.dance.ohio-state.edu/workshops/ips2.html>
<http://www.dance.ohio-state.edu/workshops/tt.html>:

Related Participant Websites:

Marlon Barrios-Solano
<http://www.unstablelandscape.com>
 Mark Coniglio and Dawn Stoppiello
<http://www.troikaranch.org/>
 Curtis Bahn
<http://music.princeton.edu/~crb/>

Johannes Birringer
http://www.dance.ohio-state.edu/Dance_and_Technology/
<http://www.aliennationcompany.com>

Scott deLahunta
<http://huizen.dds.nl/~sdela/main.html/>

Kelly Gottesman
<http://dancelab1.dance.ohio-state.edu/~kelly>

Tomie Hahn
<http://www.tufts.edu/~thahn>

Lali Krotoszynski
<http://www.eon.com.br/dance>

Gary Lee Nelson
<http://www.timara.oberlin.edu/GaryLeeNelson>

Robbie Shaw
<http://www.dance.ohio-state.edu/~shaw/>

David Tinapple
<http://csel.eng.ohio-state.edu/tinapple>

David Tonnesen
<http://f0.am/tgarden/>

Dan Trueman
<http://silvertone.princeton.edu/~dan/>
<http://trollstilt.org>
<http://music.columbia.edu/~dan>

Summary:

The Think Tank explored the practical and conceptual implications of working with interactive tools, instruments and computer-controlled systems within performance conditions and exhibition-installation contexts, both on the level of artistic composition and embodied interfaces and interface design for users/audiences.

While taking the performance and exhibition parameters (dance and technology, music and technology, art and technology) as starting points, the laboratory supported a wider range of conceptions of physical interaction, interaction within responsive environments, and interaction between physical and virtual worlds (e.g. VR installations, networked space, telepresence). Presentations of the invited artists, discussions, and lab demonstrations focused on the particular use of tools and interactive designs in performance as well as on interface design for performance spaces and intermedia art installations that can function as a shared, collective, social, and playful space.

Through exploring improvisation technologies, wearables, movement-sensing design, interface architectures, and mapping processes, the participants exchanged ideas about the physical, cognitive and transformative possibilities inherent in emerging technologies. Specific discussions groups were organised around issues derived from three subject areas referred to in this report as: Level One: the technological and infrastructural; Level Two: the artistic; Level three: the social/ behavioral.

The remainder of this report describes in some detail the presentations, discussions and practical experiments presented informally in a chronological fashion with less of an emphasis on reflection and with the aim to provide the reader with a relatively comprehensive view of what took place. Following this, Johannes Birringer has written a “Critical Outlook” that presents a more reflexive and polemical perspective drawing on the Think Tank as well as outside resources. We hope this report and the “Critical

Outlook” will help disseminate the results of the project to the wider community where further research and investigation needs to continue.

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PART TWO

Presentations (day one and two), cluster conversations, practical sessions and public session

These notes are presented as a ROUGH CAPTURE of the events of the Think Tank in discursive form. Please refer to the participant websites in PART ONE for more specific information about their work.

Day One – Presentations/ Demonstrations:

Mark Coniglio and Dawn Stoppiello of the Troika Ranch Performance Company (<http://www.troikaranch.org/>) demonstrated two aspects of their work: the performance use of custom-built wearable flex sensors known as the “Midi-Dancer” and Coniglio’s Isadora software program, a user friendly cross media mapping tool he has programmed to make it simpler for performance makers to explore the possibilities of these systems. In one use of Isadora demonstrated, the program mapped the input from the flex sensors to different parameters of the video clip such as switching between forward and reverse motion and keying layers of one video into another. This demonstration also underlined the concept of a materiality as it might relate to digital real time compositional processes (and is similar to some of David Tinapple’s work with video scanning that he showed later). The digital video image becomes a new kind of material, encoded into a form/format that allows one to do almost any kind of manipulation to it in real time. Todd Winkler demonstrated a similar approach during his presentation of his work with Dublin based choreographer and dancer Cindy Cummings. Todd has been working with the software program NATO with which he can ‘scratch’ the video. The concept of “scratching”, a term originally coined by DJs in the hiphop and techno scene, is elaborated on in the final section of this report, the Critical Outlook.

Specific questions were thrown up from the very start of the demonstrations. Two that could be seen threading throughout the days were: 1) Where and how does one choose a particular way of making something when the software tools are constantly in development? 2) When and why does one work alone or in a team? These two questions are interrelated and the participants were representative of a cross section of possible responses to them, e.g. Robbie Shaw working alone at home ‘weaving’ her rotoscoped work, combining dance and animation, learning and exploring the tools she needs to use to make the work. At the other end of the spectrum, the assemblage of a team of people such as for the T-Garden project David Tonnesen showed -- where the expertise contributes to building the puzzle of larger teamwork.

A third key question came up almost immediately when Coniglio and Stoppiello demonstrated the midi-dancer. What are the connections between the use of the body as an instrument and how can the dancer have ‘control’ over the media and what are the ramifications for the training of the body in a media play or control environment? This

became an issue that was picked up with some excitement after Tomie Hahn, Dan Trueman and Curtis Bahn presented their work a little later in the afternoon. A lively discussion ensued about the concept of the virtuosic or trained body as compared or contrasted with the everyday body (audience, user) – and in performing arts conventions perhaps drawing lines between the concept of the stage versus installations or environments. Another common issue related to interactive performance systems also came up at the end of Coniglio and Stoppiello’s presentation; the issue of transparency. How much does the audience need to know about the mapping of movement to sound? David Tinapple followed up soon with an anecdote about how some people tended to read the computer as a performer into the piece when he was actually making the selections. This suggests that the ‘generic’ audience member does not exist; some audience members will appreciate knowing (or imagining) what lies ‘under the hood’ so to speak, some would rather it remain behind the scenes, others will read it into a piece without it actually being there, etc.

Todd Winkler presented a whirlwind tour of Quicktime movies through “all the things one can do with video, sound, interactivity,” drawing from a large number of works including “Frankenstein,” “Song for the Body Electric,” “Escher’s Dream,” “Ghostdancer,” “Hitch’s Bitches,” “Falling Up,” and “Maybe 1910.” Winkler has been working for some time making interactive performances for the stage, but has more recently begun to explore movement-sensing installations that invite audience participation, trading off collaborating with choreographer/ dancers with making his own sound/ video installations. In both cases, he’s using similar technologies; Max/MSP plus Very Nervous System (designed by David Rokeby) for motion detection, and as mentioned above, he has recently added the use of NATO which supports real-time video processing to his setup. This shift from the stage (interactive dances) to installations in rooms is interesting insofar as he starts to play with the shifting audience or participant roles in such rooms, positing that installations are environments open for exploration, and each “realization” is determined by individual action, curiosity, and play. Those inside an interactive, movement-sensing area share in a collaborative “performance,” their social interactions contributing significantly to their experience of the work. One could say, as Winkler did, that “social interaction” becomes the artistic material.

At some point, Winkler emphasized that the sensors should be ‘dumb,’ affording the dancer/ designer a level of reliability regarding the sensors themselves. This seemed to contrast with computer scientist and graphics specialist David Tonnesen’s presentation where he described a system with some forms of ‘artificial intelligence’ built into it, the FoAM Lab’s “T-Garden” (<http://fo.am/tgarden/>). This project, developed with Maja Kuzmanovic and other co-workers, is conceived of as a responsive/ hybrid play-space where visitors can “converse” with sound, dance with images and socially shape media, constructing musical and visual worlds “on the fly.” The “performance” here aims to dissolve the traditional lines between performer and spectator by creating a computational and media architecture allowing the visitors-players to shape their overall environment through their own movements, as well as their social encounters with each other. Tonneson, who described his expertise as “mapping physics onto mathematics,” noted that it had a component defined as the ROOM LOGIC, one that would evolve as it learnt from the behaviours of the visitor-players.

The “T-Garden” develops the concept of the visitor-player further by proposing very clear pedagogical phases or thresholds of experience – the waiting room, the changing room, then three levels of learning in the system. These three levels of learning start from the simple individual and slowly build to emergent social/collective interaction at which point the system is meant to begin to recognize behaviour patterns and to “learn” from the visitor-players (the ROOM LOGIC). At the end of this, a short discussion ensued regarding the efforts to measure and evaluate audience responses in these environment, with the implication that these measurements are not perhaps looped back directly to the

artist/ maker, as one might assume they should, but could also prove to be valuable contributions to the overall evolving context we find ourselves in -- trying to explain ourselves, maintain artistic integrity, raise the necessary funds and find access to the expertise (in the computer science and engineering field) to pursue the work. (The “T-Garden” is interesting to compare/ contrast to other technologies used in performance and installation, especially in relation to the attempt made later in discussion to distinguish between Tools and Systems.)

In his presentation, David Tinapple explained that he works in a Cognitive Systems Engineering Lab and has a background in interactive multimedia. His specific areas of interest in the lab revolve around data overload and how to confront these issues, how to design better tools, and the nature of tool use. In his art/ performance practice (for example at the recent FCMM film festival in Montréal), he has created “live visuals” using Max/ MSP. Like Winkler, he has used NATO for real time video processing, but is now using/ testing the new JIT plug-ins currently in the Beta phase (written by Joshua Kit Clayton at Cycling74). In the non-real time area, he works with methods of post processing video in order to remove perspective, using something like a scanner to generate portraits of urban architectures and persons. Most recently he has examined the patterns made by extracting cross sections of both broadcast television and captured footage (<http://csel.eng.ohio-state.edu/tinapple>).

The work of Think Tank participant, Lali Krotoszynski, reflects on questions of both collaboration and scale. Her recent projects seem smaller in terms of their production and potentially much larger in terms of its outreach or accessibility. Working as an independent dance artist in São Paulo, Brazil, and lacking some of the institutional resources of artists affiliated with high tech labs and universities, Krotoszynski has filmed and created small animated dance scenes intended as a web-based dance installation:

“Dance Juke Box” (<http://www.eon.com.br/dance>). “Juke Box” is built with a game-like structure, but unlike video-games, it is conceived to give the user an opportunity to “compose” dance and to mix the dance with music, as a composer would, offering various combinations from 12 animated dance sequences and 5 different musical options. The “Juke Box” is an interactive project to be experienced intimately by individual users via the Internet. Krotoszynski is also a member of TanDanz, a collective of independent choreographers, and recently co-created a site-specific collaborative performance using and sharing multiple spaces in a large building. She added that she had brought a number of things (text, fabrics, a workshop on Odissi dance) with her; for her “interactivity” implies offerings, and creating situations for people’s participation. Her web based work raised the issue of different “event-spaces” and notions of (tele)presence, and whether we professionalise and privilege certain art making and viewing contexts to the extent that perhaps doesn’t allow us to experiment with some of the technologies that are appearing daily in everyone’s homes.

Curtis Bahn, Tomie Hahn and Dan Trueman (who perform together in the group Interface) (<http://music.princeton.edu/~crb/>, <http://silvertone.princeton.edu/~dan/>), presented a thought-provoking demo-lecture that expanded upon and re-presented several issues that had already come up from contexts (social, cultural) for audience understanding and receptivity of music performance to the process of building new musical interfaces and instruments that expand on the body’s ability to move/ gesture and dance. Bahn is a composer and improviser who plays a string bass extended through home-made electronics, sensors and micro-controllers. The string bass is interfaced to MAX/MSP to provide an interactive environment for improvisation or “real-time composition” of sorts. Together with Hahn, a dancer with a background in traditional Japanese dance and contemporary performance as well as a musician/ethnomusicologist, he has performed in many collaborative concerts; his work has progressed from designing gestural controllers for musical performance to building interactive dance and performance interfaces.

Trueman builds electronic instruments that involve and transform the body's feedback-connection with sound in ways both similar to, and impossible with, traditional instruments. These "composed instruments," as Bahn called them, combine idiosyncratic sensor designs with equally idiosyncratic speaker configurations (some for example worn by Tomie's), and encourage a kind of gestural performance activity that sometimes approaches dance, with the laptop as intermediary. Trueman presented his practice of fine tuning his instrument and his playing through the minimized or reduced recording of gestural data that could be played back as a trace of the live playing with sensor-active musical instruments. Trueman analyses this "recorded sketch" for information about and evidence of the types of adjustments that might be made to the interactive system. This is clearly connected to the concept of some form of rehearsal or practice, i.e. becoming more skilled as a player with the interface instrument. To close their presentation, Tomie Hahn's theorizing of her role in the dance "PikaPika" (which alludes to Japanese anime and popular video game and comics culture) helpfully brought critical discourse (gender, empowerment, embodiment, culture) to bear on that work – and by extension opened the possibility that we can perhaps find ways to look at more of the work we do from these perspectives.

As mentioned earlier, a lively discussion followed the Interface presentation as regarded the training of virtuosic bodies as compared/ contrasted to the behaviour/ pleasure/ expressive possibilities of everyday performers in these systems. Many comments later, Coniglio suggested that perhaps the interactive instrument will die with the maker which was an unexpected and provocative observation.

Robbie Shaw's work as a multimedia dance artist (<http://www.dance.ohio-state.edu/~shaw/>) varies from producing documentation templates to her own artistic work. Currently Shaw is investigating a relationship between painting and live dance, attempting to realize an extension of dance into the surrounding kinesphere through hand-drawn processes. She is combing old techniques with new technologies, drawing directly onto a moving image (a video of herself and another dancing), working with a new large scale Wacom monitor/ tablet to allow for a traditional animation technique known as "rotoscoping". She plans to rear-project the animation and perform live in front of it, addressing the challenge of how to combine projected imagery and live performance, how the animations might correspond to the dancing.

In contrast to Robbie's combination of old processes and new tools, David Tinapple's presentation, whose work has been mentioned previously, was underlined by his statement that he chooses software tools allow him to "do a lot with it" — a statement loaded with a series of questions related to the concept of a materiality. Tinapple is a skilled programmer/ scripter, comfortably expressing himself like a sculptor who enjoys a command of his or her medium (hammer, chisel...), bringing back echoes of modernism, pushing the boundaries of the forms, exploring formalisms, rule based, algorithmic structures, etc.

Axel Roesler, who currently works in cognitive engineering and design, briefly showed a rather fascinating work of visualising music that analyses and maps any musical score into a virtual architectural form in order to generate second order forms that may be directly fed into in a design process. This was an exciting demonstration how computation and creative thinking can be integrated into something like an overall design concept. His presentation on a building design inspired by a visualization of Stravinsky's "Rite of Spring" reminded us that in the dance/ technology arena often designers and architects are absent, but they have been working for some time with a dynamic combination of computation, visualisation and graphic design. The notion that the architecture of a building had all the information of the music embedded in it was very thought provoking.

He ended by showing us his new design of a portable-CD player whose configuration was inspired by the music of Dave Brubeck's "Take Five."

The first day ended with a very basic Isadora / MIDI demonstration, a step-by-step process for those completely unfamiliar with them. A couple of key questions arose from this demonstration related to the need to know about digital technologies in order to work with them such as: 1) how much do we need to know?; 2) when and how do we learn?; 3) what contexts for learning?; 4) does the learning facilitate or replace collaboration? It was already apparent that lots of areas of expertise were represented during the Think Tank: computer graphics, choreography, video and sound, electronics, architecture, mathematics, cognitive science, learning skills, languages, ways of thinking, externalisation – collaborations, and management of projects involving software.

Day Two - Demonstrations

Scott deLahunta opened the sessions by presenting some observations from the first day followed by a description of the "Software for Dancers" project in London mentioned in PART ONE (<http://huizen.dds.nl/~sdela/sfd>) that focussed on the development of concepts for rehearsal tools for choreographers. deLahunta described briefly the different outcomes of the project ranging from the development of sketching prototypes and storyboard/ organisational tools to the need to support mature choreographers to make radical research forays into the field of technology research and development.

Sarah Rubidge then showed a selection of interactive installation based works she has been involved in e.g. "Halo" created by Simon Biggs on which she collaborated on the choreography; and "Passing Phases." She also showed a new work-in-progress ("Hidden Histories," with Joseph Hyde) currently under construction. These projects favour the concept of touch and proximity in the context of what Rubidge refers to as "spatial interactivity." In "Passing Phases," the images show/ loop images of gestures that reflect on the theme of touch, sensual intimacy. Rubidge's interests lie with establishing simple and clear relationships with images and sounds that allow the participant or viewer to build a meaningful relationship with the space and its contents. As the numbers of viewers increase in a space – there is the possibility for increasing confusion or a point at which 2 or 3 people can still understand what is going on, but a view more and the relationship is broken. In her most recent work, the movement of the viewer in the space drives the movement of the projected nude figures who appear to be approaching, receding, and floating up into the air. The motion of the projected video images and the perceptible content of the installation's sound environment thus seem in a state of perpetual flux, as are the relations between the viewers and the imagery with which they are interacting.

Composer Marc Ainger's characterisation of himself as someone who doesn't do "technology and music" or "technology and art" but "art and art" – pointed towards larger issues regarding how individuals place themselves in these fields. His work with choreographer Elizabeth Streb, creating interactive sound for a sensor-rigged trampoline, explodes the notion of full body movement in an interactive space – these bodies fling themselves through the space with great precision, but probably with little aim to hit something like a tiny sensor – their aim seems more to hit the trampoline or the floor mats (you need to know the work of Streb to get the reference). Ainger then played an excerpt from an interactive music piece (all musical instruments of the orchestra and the conductor's baton were linked via sensors to the computer and MAX/MSP patches) which demonstrated his passionate interest in how "music can transform space," an interest that he refers back to his early love for radio drama.

It seems a common artist strategy to seek conditions for shifting one's perspective, starting points, breaking habits, finding new ways of working, etc. In choreographer Bebe Miller's terms – "etching a different landscape around ourselves in a working situations" – is her expression of one of the ways she is looking at technologies. She is making a close inspection of technologies, looking closely to see if there is "something about telepresence", about interactive systems that could contribute to and deepen the compositional process? It seems she is seeking some evidence in a whiff, a texture, a hint, something not quite tangible yet – any of these might lead her further in the direction of exploration.

Liza McConnell's installation work again points towards the relationship between artist and materials, and the questions about skill and learning, collaboration, etc. McConnell was explicit about her interest in "how can I learn and do it myself?" Her "contraptions" combining 19th century magic lighting and camera obscura techniques with the exposure of how the images (video projection, light projection) work and how they are constructed (with paper, bubble machine, fog machine, lightbulb, miniature oil derrick, oil barrel, battery, duct tape, etc.) were illuminating. She favors exposing the "technology" and refers to the projections as 'real time' images. McConnell has worked with digital software, when she was developing sketches of the windmill motifs in her recent show, but she finds that they hide how the image is made. She aims to expose this process/ contrivance in her own work. The homemade and rough quality is on purpose. She also used an old pin hole camera in order to 'render' a 3-D computer image she had created. This juxtaposition of old and new -- or treating the new with the old – is an interesting artistic strategy (reminiscent of the work of Bernie Lubell and Paul DeMarinis in "Dry Rain Peddling" 1995 – a immersive 'virtual' thunderstorm generated by a mechanical system involving bicycles, ropes, pulleys, pebbles falling on corrugated steel, etc.). The process and intention is embedded in the final results. She also prefers portable media and things she can dismantle, favoring taping over welding... and impermanence. What is the relation between impermanence and the ephemeral, and a generating (code) system and the provisional?

Choreographer Iris Tenge, who had arrived prior to the Think Tank to conduct a week-long masterclass and workshop in "Improvisation Technologies," raised questions related to consciousness, awareness and cognition, especially in regard to the dancer's physical sensation of and extension into space and to the knowledge of techniques in the body. She told an anecdote about dancing for Hamburg Ballet (John Neumeier) where the perfection (the platonic body) was the goal. Then she went to London and did a workshop with John Cage and Merce Cunningham. "Giving chance a chance" was her lesson from Cage. She also spoke about her collaboration with composer/designer Ferdinand Försch in Germany, and her slowly awakening interest in the dance technology community, but noted that as a freelancer she has not had the opportunity for a sustained practical investigation of new technologies.

Cluster Conversations

The second half of the Think Tank was organized as a series of cluster conversations. The participants formed three workgroups of 6 or 7 discussants each. These workgroups were invited one at a time to engage in a themed discussion in a close circle of shares. This "inner" cluster tried to define and discuss the key questions, while an outer circle of seated participants carefully listened and took notes, preparing "feedback" responses for the 7:00 pm webcast session.

Level One: The technological and Infrastructural. Mark Coniglio facilitating:

The following is a list of keywords and phrases that went into shaping this first cluster conversation.

Tools versus Systems: What is “toolness”? How is the tool an extension of the body incorporating the intention of the operator (hammerer using hammer, violinist using violin, dancer using dance technique, bodily knowledge with movement-sensing devices, etc). What is “systemness”: the interactive system and its protocols incorporate the user but not the user-intentions. Design practices which make the interface as invisible as possible or seek to make the navigation/ use easy and intuitive; the performance-user (dancer, choreographer, composer) as extended instrument of interactive system; design of “characters”, sonic display/instrument design, composed instrument, frame of animation; painting - drawing -dancing (motion capture); the creation, implementation and saturation of media protocol; gesture/speech recognition; data mapping and inframedia.

The discussion seemed to circulate primarily around the notion of tool, instrument or system. Later Coniglio commented that no agreement on terminology seemed attainable, but it’s interesting to look back and see that initially the tools/ system relationship seemed to harbour a richness of possibility for discussion – but in fact it resolved into a set of clichés before our very eyes and by the end of the two days “tool” or “system” could only be referred to in quotation marks. This certainly underlines the slipperiness of language and discourse.

Tinnapple’s concept of a system is something that begins to dictate content – where causality (linear) dissolves. Coniglio proposes that a tool could be an instrument; medical and precision instruments are mentioned. The concept of “taking a hammer and using it like an instrument” is mentioned – an object being able to achieve a dual sense of purpose. Coniglio mentions that his concept of system is more rigid/restrictive in the sense that the system comprises something that is reliable, taking input and giving output. Cybernetics is mentioned – the concept of the oarsman who steers within an environment within which s/he has some agency but is dependent on getting and understanding feedback from a multiplicity of factors. Roesler reminds us that the primary ‘input’ (informational) component of contemporary sensor-based heating/cooling system in houses are not the fuel and the electricity but the temperature air outside the house, and then the inside temperature becomes the output.

Tinnapple’s definition of his process of making entails starting on a MAX patch on the day of performance, working intensely all day and performing at night – this way he retains in short term memory the specifics of how the patch will perform and how he can throw it away when he is finished. This is reminiscent of conversations with programmers who build something and can’t remember how they did it a year later. The specifics of the underlying code are only retained during the periods when the code is actually being built (Tinnapple’s experience returns in the final public session when it is remarked that his ‘making a patch and using it the same day’ process seems remarkably physical).

Coniglio asks Tonnesen if he thinks of himself as improvising when he programs; later Tonnesen noted this is the first time someone has asked him this question. As regards sensor or interactive systems, the “T-Garden” team aims to develop a system that learns and develops some form of understanding of the participants and is able to store this as history and feed it back into the system (the ROOM LOGIC). Similar to the cybernetic/oarsman, you can steer within the system, not ‘controlling’ it but based on some sort of ‘feeling’ of how the system works. Where does this become an intuition? and when would this become a form of embodiment?

Roesler brings up the principle in systems engineering of viewing the ‘model’ as a cognitive mechanism whereby the viewer or participant builds up an understanding

through ‘decomposition’ of the object of perception towards a model that, once constructed, can be placed back into the system. This was not easily understood but appeared useful insofar as a discussion which seemed to be largely about semantics managed to arrive at a conception of the cognitive processes involved in the **interaction** with something, whether tool, instrument or system. One of the final comments of the session touched on the “visceral feel” the mathematician might have for equations – it begs the question as regards Trueman’s adjustments of his hyperinstruments. We assume that this might be based on the development of some intuitive grasp of what changes in the code/ scripts might do. Can such intuition be considered visceral, embodied thought?

Level Two: the artistic. Bebe Miller facilitating.

The following is a list of keywords and phrases that went into shaping this second cluster conversation.

Application of technologies in artistic contexts: application, integration and translation across diverse practices. The virtuoso (skilled) performer, “composed instrument,” vs. unskilled audience, and shared kinetic experience of music, audience interaction, user behavior. The sonic costume, sonic masks, characters in the interface. The “staged” interactive performance vs installation, virtual worlds, mixed realities, dynamic and responsive environments and “game” structure or navigation-interface design.

Lali Krotoszynski launched the discussion with further reflections on the nature of a system as a situation with “shared properties” where one element changes space and time (a chaotic system?). She also shared an interesting proposition as regards the senses as a tool, inspiring us to consider **the gestures that carry tool information**, such as a ‘hammering gesture’, etc. Barrios-Solano proposed that by getting locked into a discussion about cybernetics/ systems/ tools, we are cordoned within an “epistemological model,” caught within certain metaphors. He posited a set of new metaphors for interaction under the concept of ‘coupling,’ whereby we can define any relation through (1) proximity (2) similarity and (3) simultaneity.

Bebe Miller stepped in to ask the question, ‘Are technologies a way of getting us out of the studio, making dance more accessible?’? The question was less related to how the internet might disseminate/broadcast more dance, but how technologies, the discourses and practices related to emerging technologies, might function in multiple ways to bridge certain gaps between those who make dances and those who don’t.

Shaw wondered if perhaps there is a greater interest in process as evidenced by consumer items such as DVDs making available the behind-the-scenes of movie making, etc. Bahn suggested, picking up the discussion about what will remain when those making these hyperinstruments “die” (referencing Coniglio’s observation already mentioned) that perhaps this priority on process means that what remains is the process -- the methodologies. It’s interesting to consider this as perhaps something like notations or scores, instructions that refer to process methods: given the rapid change of digital technologies which seems to consistently resist the sort of “rehearsal” or long-term practice that we are accustomed to, and as the “tool” or “instrument” is constantly changing, “process” becomes the tangible outcome (a radical positioning reminiscent of Eco’s comparison between the poetics of a ‘work in motion’ to the aesthetics of the fixed and closed form in his seminal “The Open Work”).

The discussion turned to the experience of being in the interactive system. Stoppiello said that she is “different” in the midi suit, implying that this is a form of awareness that can be practiced/trained. Miller and Tenge both picked up on this, with Bebe addressing the potential transformation of the body with regard to habitual movement logics, letting the

body take care of what it does well, and tracing the changes affected by the midi suit. Hahn also mentioned feeling “huge” in the PikaPika character/costume where she wears external speakers on her arms and can make the building shake with sonorous sound. Barrios-Solano pointed towards the techno-scientific discourse we have gained the “rights” to use, and elaborated on this notion of the extended body dancing with data in regard to the history of improvisation. “Steve Paxton danced with gravity’, he suggested, “we are dancing with data, in a web of causality.”

Level Three: the social/ behavioural. Hahn, Trueman and Bahn facilitating.

The following is a list of keywords and phrases that went into shaping this third and final cluster conversation.

How are these art/ technology works absorbed, anticipated and transformed across communities, event-spaces and cultures, audience/ participant behavior; the “character” behavior of the dancer in the interactive environment and responsive environment; the “player” behavior of the exhibition/installation visitor/audience in a responsive environment; who or what controls the “activities” and inframe media modulations within the system (environment); what happens to “translations” of movement or sound once we control/modify them with technological systems (MAX/MSP/Nato, VNS, Isadora, etc), and can we infuse interfaces and interface design with cultural traditions and expressions.

Dan Trueman surprised us with a fresh schematic connecting along the axis of player to culture and presentations to process. The diagram locates player over character over the concept of training (virtuosity), training runs towards presentations and process (in both directions) and on the other side connects downwards to balance, through preservation, tradition (transmission is added) and culture, with Barrios-Solano requesting that perception is tagged on between tradition and culture. As a thought tool the schema was provocative, and a good starting point for discussion.

The term “virtuosity” caused a few wrinkled noses on the one hand and nodding heads on the other; it is loaded with connotations of exclusivity on the one hand and entitlement for hard work and practice on the other.

Birringer pondered the question of “new” aesthetic environments and reminded us that “youth” culture has few problems with new technologies. Ainger summed up his view by suggesting that what artists are doing is “world building” and “telling stories.” Winkler offered his observations on audiences/participants in the context of his new direction into installation work where “social interaction” is the material. Designing an experience for someone where they “touch” others, for example. With regard to the issue of cultural content and specificity (on a global scale), Birringer wondered if these interactive designs are simply electronic facades, with little or no depth of cultural or community relation. Winkler commented on the earlier observation on process and the DVD and suggested that in his experience audience respond well to an explanation beforehand. He provides evidence in the anecdotal account of the guitar player in a rock concert you could only see from the head up, hiding “how” the sound is made. Ainger mentioned that so much of what artists now make is seen only once. It is suggested that artists could expose the process more by creating more outputs or ways into the work. Ainger replies that sometimes the worst person to talk to about the process is the maker.

The spectrum between explanation and touch/sensory experience is intriguing. Coniglio later suggested that the concept of ‘intimacy’ became freshly compelling for him after the conversations. Bahn offered the interesting comment that when he designs a new instrument to play with Dan in a duet, this instrument/tool or system can’t be played solo

-- it's designed to be played with someone. deLahunta indicated that his thought matrix/ axis that places research to rehearsal and experimentation to production is enhanced through Bahn's idea suggesting 'rehearsal' might be augmented with the notion of 'tradition'. The issue of "character" in an interactive environment is not pursued but remained on our minds after Hahn's account of the very different personae and "sonic masks" she performs in her collaborative work. Her own expressive dance vocabularies are rooted in her Japanese training, but she considers her performance personae hybrid and reflective of her biracial and polycultural experience.

Practical Sessions:

Midi-Dancer/Isadora and group improvisation

The second day ended with a series of practical sessions that included Kelly Gottesman's documentary presentation of digital slides and video from "L'Entre deux," his recent environmental dance installation-concert that featured a duet created through telepresence and a live internet link to a remote site. Gottesman explained his sculptural and choreographic process and the learning experiences he had undergone in Birringer's "Environments" Lab and the collaborative work with the ADaPT consortium (Association for Dance and Performance Telematics) which represents one part of OSU's research paths in dance technology, along with research in interactive environments and motion capture.

Coniglio and Stoppiello offered a hands-on workshop with the Midi-dancer suit, and the group watched Iris Tenge, Bebe Miller, and Marlon Barrios-Solano test the interface. The main recognition for the performers working with the Midi-dancer was that it's a wearable interface. It comprises flex sensors and a transmitter worn on the body (where the small wires run from sensor to transmitter) and takes some tugging and pulling to get it in a functional position relative to the joints of the body. The "flex" data from the sensors is converted to MIDI input data for Mark's new software Isadora that maps the input to some form of output (sound, video). We notice these are different bodies in the (same) system, and Bebe has a chance to watch Marlon and Iris improvise. Miller then gets into the Midi-dancer and triggers a simple sound/spoken text loop and a video clip (pre-recorded outdoor footage of one of Troika Ranch's dancers in a wheat field). A camera feed also inputs her movement to the Isadora system. This is a real time video image of her, but it's delayed because of the fire wire speed.

Miller's comments/questions after working for about 10 minutes could form the backbone of further research: [1] how quickly a "narrative" appeared, [2] how quickly it became compositional, [3] how to keep the presence in her own dancing, [4] how to learn what the improvisational "headset" should be with this system, and [5] she felt like she was "listening," and how does listening change in relation to different sounds or self-generated spoken texts? Her last comment was eye-opening: the dancer **listens** to the environment she creates interactively, and can thus compose dance movement almost as if she were playing an instrument and sensing the acoustic and visual (video) co-resonances in the space.

These are important findings, especially her "compositional" comment. During her earlier presentation Bebe had offered an observation on the hard edges/harsher processes of the digital in relation to soft ideas/softer processes of the bodily dance exploration. The Midi-dancer is constantly "generative" -- you move and it delivers data. This "datobody" is different from the telematic visual bodies of Kelly's experiments within remote spaces and with which we would next experiment during the webcast.

2. WEB CAST

The internet webcast was introduced by Birringer as a warm-up thinking “rehearsal” for the public session on the last day, and it was intended to be spontaneous and improvisational. It started up with a physical “interaction” improv (which was telecast) prepared by Lali Krotoszynski. The guest from Brazil also mentioned that she had spent several weeks with the Environments Lab teaching a special Odissi dance workshop that resulted in the members of the Odissi group sampling the percussive footwork sound created in the rehearsals. Krotoszynski offered the sound samples for processing, and then introduced two large red and black fabrics (with holes in them) she had brought with her.

Inspired by the cultural precedents in her own history -- the participatory performance actions with parangolés or non-art objects which Brazilian artists Hélio Oiticia and Lygia Clark had instigated in the 1960s and which can be reviewed in their conceptual relationships to Fluxus, happenings, live art and body art experiments in Europe, Japan, and the U.S. in the 1960s and 1970s -- Krotoszynski encouraged members of the Think Tank to play with the fabrics and the spatial transformations they enabled through interaction. As it turned out, the performers/ players not only improvised with the shape- and space-transforming qualities of the fabrics as they touched upon themselves, but also incorporated and enveloped the “audience” members sitting on the sides of the studio, thus creating physical, sensory and metaphorical connections between everyone present in location (this enveloping, however, could not translate into the webcast, presumably, since on the internet it will only be perceivable as a screen-based medium/performance for viewers).

In the subsequent “Saturday night live” round robin conversations on camera, members of the Think Tank freely roamed through a series of questions and concerns that had come up during the day’s cluster talks: deLahunta pondered the group’s focus point, “what is at the center of our investigation, of this think tank?” He suggested it’s the body and within this, the gesture is the focus, capturing that gesture in data forms and mapping this data to output. Coniglio and Stoppiello are building a system for gesture capture and data mapping that is meant to be useable with a smaller learning curve. Trueman and Bahn rehearse their instruments and the related gestures, making adjustments to the quality of play. Tomie Hahn not only captures gesture data but also wears the speakers -- becoming the sonic mask, thus being the input and the output.

Rubidge, Winkler, Tonnesen and McConnell are building installations for the everyday body/ participant, creating the conditions for the interactive experience. Here one would need to clarify much more specifically how various installation designs include an interactive dimension - in the “performance” or “play” of the user – that feeds back and affects the system or leads to effective and evolving experiences in the user’s cognition and relationship to given materials, objects, sounds, and visuals. Ainger was involved in building the interface for bodies to impact; the other participants, Krotoszynski, Shaw, Miller, Tinapple, Roesler, Barrios-Solano, Tenge and Gottesman, are in various stages of learning, observing, and making work that carries similar interests and aims, using similar technologies, enabling them to explore the body as the interface.

PUBLIC SESSION: Findings and Outcomes

Prior to the public presentation, everyone was asked what they might like to show, and a short discussion was launched about the most important issues that might have emerged. deLahunta observed that the group perhaps had not arrived at the point of “findings,” that time had been too short, but we were on the right trajectory. However, several propositions then emerged such as: 1) Coniglio noting that we still are looking for a common language; 2) Winkler stating that when everything is new and changing rapidly within a diversity of working practices, it makes everything very “personal”; 3) Rubidge claiming that work should be led by art not the technology; 4) Bahn emphasizing that it’s important to conduct research, but maybe not too many people need to see something or have an (aesthetically unsatisfying) experience during stages of interface development. deLahunta stressed his interest in determining how research can be initiated, framed and carried out so that it can also be documented and shown as a work onto itself in specific contexts.

The final public presentation, to which local audience was invited into the studio, was a combination of repetition/ demonstration and a few new things (work that the participants had not been able to show before). The repeated demonstrations allowed for distillation and re-analysis. A few summary comments were offered, such as Tinapple’s description of working all day on a MAX/JIT patch for the evening performance, prompting Miller to comment on how that sounds like working “in the body.” Roesler remarked that watching the improvisation on Saturday evening was very inspiring to him- simply to see bodies moving in space.

Tenge offered the comment that the general public perception of dance does not tend towards any understanding of where dance and technology experiments might be co-generative/ productive. This led to a small debate over such perceptions, with Birringer emphasizing the unacknowledged deep history of an at least century-old close relationship between dance and other media (photography/motion studies, film, animation, experimental and electronic music, movement simulation, etc.). Miller proposed that “more funding” is needed for any future developments, a proposal which dovetails with Birringer’s suggestion that such experiments require appropriate studio or lab conditions and curatorial and critical/discursive practices to provide contexts and reference points for the new work with interactive systems. deLahunta ends the round table with the proposition to engage performing artists and dancers with computer scientists and software developers, in particular working in HCI or physical computing contexts, where the body as the interface research could clearly benefit from dance knowledge.

END PART TWO

Think Tank Report

"New Performance Tools: Technologies / Interactive Systems"

January 25-27, 2002. OSU Department of Dance

by Johannes Birringer and Scott deLahunta

PART THREE

Critical Outlook

by Johannes Birringer

The Think Tank as an opportunity for dialogue and collaboration was unanimously considered by the participants to have been a rewarding experience, especially as it drew attention to the practical levels of process in interactive design and to the improvisational and compositional levels of embedding the performer's body in/as the interface, as the composer/composed instrument. Furthermore, the overtly interdisciplinary nature of the Think Tank raised awareness of the conceptual, experiential, and also political dimensions of such research: ideal conditions for conducting artistic and computational research in interface design are by no means to be taken for granted, and institutions that house separate dance, art, music, computer engineering, design, and communications departments have by no means shown the understanding and foresight to encourage younger artists-students to engage in interdisciplinary research projects and programs which would allow them the kind of cross-fertilization and cross-media practice required to develop new artistic and poetic methods. Not to speak of the logistical difficulties (access, equipment, expertise) that independent artists or performance companies, visual artists, or musicians might encounter if they were bent on incorporating interactive systems into their artmaking.

Nevertheless, interactive tools and systems, ranging from multimedia and real time synthesis software to the construction of proximity sensor (haptic, pressure and flex sensors, etc), distance-sensor (e.g. ultrasound, laser) or camera/video-based responsive environments and "seeing spaces" (Scott deLahunta's term) and telepresence interaction are already in the hands of practitioners in the independent communities, and some of these artists have developed their own custom-built instruments and tool-kits for their work. It is to be hoped that the underlying shareware ethos of the independents, together with the facilitation of university programs, allows for greater dissemination of the practical knowledge that practitioners have gained and that could benefit future generations of artists who are now growing up with computers, portable media and internet access.

For our critical evaluations of the cross-over paths and collaborations, for example between trained artists from the performing media (dance, theatre, music) and the visual arts (sculpture, painting, holography, textile design, etc), and digital artists and programmers coming from the computing sciences, engineering, design, architecture, robotics, VR and AI, it remains to be seen how we find clearer and more succinct parameters for the understanding and definition of the aesthetic and social construction of the work that will be shown and promoted as "interactive media art." From the recent discussions in the dance and technology community it should be apparent that a broader recognition or critical acceptance of interactive danceworks does not exist to date, and from Curtis Bahn and Tomie Hahn's recent experience of being featured in the "Science" section of the New York Times (with Tomie pictured in full gear, blue whig, accelerometers, speakers and all -- her PikaPika costume - smiling at us in front of a dance studio mirror; cf. "Making the Music Sway to your Beat," 11/29/2001), one has to assume that it's the same in the contemporary music world, since the research article mentions the "inventors" and builders of new hyperinstruments and the interest provoked by a recent Computer/Human Interaction conference in Seattle ["New Instruments for Musical Expression"], but then ends in a downward spiral. At the end, interface design is questioned and measured against "true" musical instruments, and Michael Gurevich is quoted saying:

we will never be able to pack the intrigue and expression afforded by real instruments like saxophones and guitars into a wearable device...

Dawn Stoppiello recently wrote that "most of the information being passed around about the actual art making and the processes of the artists working with new tools/instruments/gear are in PhD thesis papers and so are in university journals and not getting out to the

other more main stream arts publications.” She then asks ”where are the major works of dance that use specific technologies that have been taken seriously by art critics/writers besides BIPED (Merce Cunningham/Paul Kaiser)?” (dance-tech list, November 2001). Doug Rosenberg, Scott deLahunta, Kent de Spain, Jeffrey Miller, myself and others have commented on this in last year’s internet debate, with de Spain suggesting that

as a field, as a movement...we keep getting stuck at the stage of experimenting with the technology instead of honing the images into art. Part of that is inherent in the aesthetic of technology (a driving aesthetic of our culture these days) which is highly linear/developmental (meaning that we drop the old as soon as the latest/greatest is issued). Much of the work I have seen in dance and intermedia (with the exception of some very fine single-media film/video work involving images of dancing humans) seems to be continually in a Beta release artistically. Part of that stems from our marginality and lack of access to the tools and funds it takes to make higher level work ...At the same time, I know that I would like to see dance and intermedia artists forego new tools sometimes until they have really honed the last ones. (dance-tech list, 12/05/2001)

This issue of aesthetic development (with wider appeal and recognition), and the integration of interactive tools and systems into our embodied performance practices (which also imply the development of new performance techniques), brings me to two critical questions regarding the current use we are making in our interactive design processes, and in our thinking about the often unscrutinized concept of “interactivity.”

(1) I propose to argue that “interactivity” - with all the conceptual issues this term brings along - cannot be applied equally and uncritically to performance presentations (stage) on the one hand, and performative and responsive environments, visual art/intermedia installations, telepresence events, and immersive VR environments on the other. These genres or parameters involve drastically different considerations, even if they were to use the same interactive tools and systems. These considerations are design considerations reflecting upon the artistic outcome or social or aesthetic or spiritual experience desired by the designer or design team, and thus they are also highly site and context specific, since an installation can go up in an artworld context (gallery, museum), but can also take place on a side walk or in a disco club or a shopping mall or an abandoned warehouse.

It became clear during the Think Tank, although it was not articulated very forcefully, that there is a huge conceptual, practical and aesthetic difference between the use of either “invisible” or “transparent” interactive tools and interface designs on a stage (presented in a prepared or rehearsed work for an audience to watch) and the use of either “invisible” or “transparent” interactive devices and interface designs in an installation-environment which, as Todd Winkler wrote, “offer audience members an opportunity to become actively involved in the creative process by influencing image and sound output from a computer (“Audience Participation and Response in Movement-Sensing Installations,” paper presented at ISEA, Paris, 2000, p.1).

This “involvement” of the unsuspecting (or suspecting?) audience or “user” needs to be examined precisely along the axis of the critical and conceptual criteria we have delineated for the trained performer whose body (as moving and sensing instrument) is or becomes the interface in what artists like Bebe Miller or Robbie Shaw or Iris Tenge would consider an expansion of choreographic and compositional intention and intuition. Tenge spoke adamantly about the choices we make in movement exploration and composition, even in, or especially in, improvisation which, it can be argued, is always already based on a particular movement system (a rule system or conceptual grid, and a cognitive process, with which the dancer knows how to locate herself in space and in temporal flows in/through such space).

The dancer, presumably, experiments with the vocabularies of dancing and their extensions, in a given situation which is knowledge-based. The user of an interactive installation, then, would presumably operate, under the conditions of navigation and intuitive exploration of the responsive environment, with an undefined conceptual grid which is neither based on movement nor choreographic knowledge but could be based on sensory and motor experience and on social experience or game experience of playing and dancing. These experiences could then be traced also along the cultural vocabularies and narrative or “theatrical” sensibilities that people with different backgrounds may bring to an interactive environment which invites becoming involved in a creative process (something that not all audiences can be assumed/expected to enjoy).

In light of the presentations by Marc Ainger, Sarah Rubidge, Todd Winkler, Lali Krotoszynksi, David Tinapple or, especially, Liza McConnell, it seems apparent that sound installations and visual media installations (involving objects to be touched, handled, explored, “read”, discovered, etc) may not operate on the same level of (movement, action) exploration as an interactive dance installation, and no-one really addressed the issue of what an **interactive dance-installation** would be like, if it involved more than the haptic, sensual touch dimension or proximity-relationality **implied** by interactive video projections (cf. Rubidge’s current work on “Phases” and “Hidden Histories”).

The interaction with a digital video projection which changes in response to audience behavior raises issues that are neither related to choreography nor to improvisation, but to unsuspecting audience-reactivity to “rules” that they will begin to suspect being built into the “system” or game and its reception-structure, allowing for their re-application and, one must assume, subversion or de-articulation. Each socio-cultural system, for example a fairground or the cinema or the shopping mall, will evoke their specific culturally learnt reception and action behaviors, and so we can assume that interactive installations can indeed be experienced along the axis of such rule-bound and flexible (since intermixable/rewritable) reception behaviors which, according to Jacques Attali’s cultural theory of the evolving political economy of music (Noise, Minneapolis: Univ. of Minnesota Press, 1985, p. 135) imply a transversal: the “listener” becomes the operator and composer, thus “negating the division of roles [rules] and labor as constructed by the old codes. Therefore, in the final analysis, to listen to music in the network of [digital, interactive] composition is to rewrite it.” In Michel Gaillot’s more recent analysis of techno music (Multiple Meaning: Techno - An Artistic and Political Laboratory of the Present, Paris: Disvoir, 1999), he develops this idea of “living the possible” further by examining both the DJ practice of “making music with music” (live remixing and recompositing) and rave dancing as a collective performance in a constructed environment: “techno does not create a work but an environment, a situation to be experienced in common... an experience of the ‘with’” (p.62).

Regarding the “experience of the ‘with,’” Marlon Barrios-Solano perhaps came closest in suggesting that all art experiences involve the creation of relations, of a Gestalt, which is modeled upon models (there is never a ‘right’ or one model only), and he understands interactivity to mean a “coupling” (embedded in couplings of systems) that invokes questions about how we know, how we create wholes and fragments, and how we might observe a system that is generative and whose environment is unstable, unpredictable. The unpredictability of the boundaries is what is essential in performance not modeled upon the older model of the “finished” work that presents the finished facade (illusion). The performance we are addressing here is modeled on the “unfinished” or “unfinishable” (process); it is also a paradigm for all internet-based communication.

It appears that we can build on the small improvisational lab experiments we made during the Think Tank, since they have larger ramifications for all of us. One experience would

be based on the exploration of the “wearable” - since wearable interfaces could easily be built into an interactive environment and would also allow the unsuspecting “user” a threshold (application of a “costume”) and induction that encourages the assumption of a playful “character” or persona for the experience of the unfinished world of the interface.

Secondly, as in Krotoszynski’s offering of the parangolés for audience interaction, the use of fabrics and objects that are “sensitive” (wearables) yet understandable as everyday objects could inspire the users to be as creative as they wish in the exploration of how they can move with them, how they can build something with them or use them to interact with others in a “T-Garden” like playspace -- a proposition which was also built into Oiticica’s late work, the “Quasi-Cinemas” (1973), where he built multimedia environments (slide projections, music) with hammocks and mattresses to invite visitors to lie down or play around, bringing attention to bodily comfort, exuberance, liberation while subverting the formal logic of the cinema and traditional notions of aesthetic contemplation and artistic value.(1) Interactive installations, I suspect, follow the same logic and privilege audience activity, and thus an activation of playful behavior and subjective kinaesthetic or synaesthetic “processing” of experience with multimedia-communicational phenomena which breaks down any notions (in dance) that are based on formal considerations of choreography. The correlation of design and choreography is thus completely undermined.

[We have to assume that the vast majority of trained dancers will not want to design themselves out of business, abandoning the presentational performance (on stage) for audience interactivity and participation. We also have to assume that musicians will continue to compose and play with their instruments, and visual artists and sculptors will prefer work in presentational exhibitions that allow a certain amount of artistic and creative control for the implementation of their ideas. Thus the actual playing field for audience-participatory interactive environments will be limited to those media and performance artists and designers who are explicitly interested in investigating the path that Hélio Oiticica and others have traveled.]

I suggest that we investigate the implications of wearables further, drawing from deLahunta’s report on the London “Software for Dancers” workshop and the TRANSDANCE Lab in Athens, Greece [<http://huizen.dds.nl/~sdela/transdance/report/>]. In the context of the latter deLahunta broached the subject of constraints (in the “wearable” interface) which was not investigated in the OSU think tank.

(2) My second proposal concerns the level of mapping procedures and manipulation/processing of video and audio material generated in the interactive performances or installations. In other words, the issue of “scratching” and real-time video or audio creation, live processing (post-processing) and manipulation via Isadora or Max/MSP/Nato and JIT or other interactive systems and hyperinstruments, which was demonstrated in the think tank, needs to be pursued in greater detail and delineated in a manner that allows understanding in the way in which Coniglio and Stoppiello offer a system for gesture capture and data mapping useable with a smaller learning curve. Such systems and delineations could then be incorporated into our training practices with performers, allowing them to get a hands-on understanding of the concepts involved.

But the main conceptual shift implied by our Think Tank observations concerns the manipulations on the material level of “inframedia.” First, the practice of data manipulation and data mapping is of course diverse, polymorphous and not easily defined. One would have to examine the various forms of “scratching” in different contexts of computer music, interactive media, sound art, video art, graphic design, motion capture-derived animation, telematics, etc. What makes inframedia manipulation a common media arts practice today is the capability, afforded by digital technology, to

manipulate digital objects on the level of data, “interfering,” as Scott deLahunta as suggested, with the “numeric properties of digital media image or sound.” It means that in “artistic terms, the basic materials of the new media/ digital artist is not necessarily the image or sound itself which is essentially a representation or manifestation of the underlying numeric representations or mathematical formulae (although this view does not take into account the needs of an audience/ viewers). Essentially these underlying numeric representations can be broken down further and used to represent a variety of ‘surface’ media. Surface media refers here to the image or sound, text or graphics that are the generally accepted new media means for communicating and producing meaning for the viewers/users. Generally speaking, today's average computer user / consumer does not grasp the underlying numerical systems that lie at the heart of computation. However, for an experimental (non traditional) artist working with new media, it is normally not sufficient to simply manipulate the surface media as this does not allow for an interrogation of the basic materials or principles of the digital media” (TRANSDANCE Report, p.5).

What is beneath the surface is the underlying numeric system or the code, what we hear or see is the signal. In audio terms, we could say that what we will hear is a signal that is constructed, assembled, processed, manipulated and layered, and in real-time interactive processing there will be a continuity/non-continuity of such constructions. This is neither sound as a transparent substrate for organized expression, as in Western classical music, nor sound being “itself” or like the weather in a Cagean sense, but sound being mediated, synthesized, generated and collaged (cf. Mitchell Whitelaw, “Inframedia Audio: Glitches and Tape Hiss,” Artlink 21:3 2001, 49-52).

I became interested in this inframedia operation when I saw Jarek Kapuscinski’s interactive piece Yours (created with Nik Haffner, Antony Rizzi) performed at CrossFair 2000 (Choreographic Center, Essen, Germany), since his scratching of the digital video of the dance/the dancer eliminates the physical dance and places the construction of the interactive experience entirely on the side of the “player” playing the touch-sensing keys of a piano: the piano keys manipulate the digital video image on the screen by intervening in the order, continuity and speed of the dancer’s movements. The interactive set up allows control of the surface media down to the finest molecule (frame-rate, pixel-rate), and the generation of what the audience sees (the live videodance) is done as a manipulation of the image-frame as instrument. In other words, this is no longer a dance or an interactive dance, in conventional understanding. Kapuscinski plays the digitized media as an **image instrument**.

If we apply this lesson to our Think Tank experiment with Bebe Miller generating the Midi data for the processing of sound data in the sound patch of Isadora (or MAX/MSP), it follows that a dancer could be the interactive generator of a signal process which will not at all cohere into a logical surface media representation of dance movement. Once the signal processing is interfered with, the connection between movement and sound becomes unreadable in dance terms. And yet it becomes an audible artefact of sound media.

Sound artists have noted that there is widespread interest today in the abstract, tweakable flows of audio-data. This is exploration of audio infrastructure; often the artists enjoy precisely the contingent and unexpected occurrence, glitches, clicks, pops and skips, which is similar to the unpredictable stream-disintegrations in telepresence or the visual scan-data slicing David Tinapple showed in his “Pacific Slip.” I am not sure how this would compare to the surface of digital dance, but in sound art the glitch has become almost a fetish. As we’ve seen in live concerts by Oval, Aphex Twin, LTJ Bukem, Alec Empire, Funkstörung and other underground musicians, it’s only one of a larger repertoire of media noises generated from the infrastructure, along with tape hiss, digital aliasing, and the sharp clicks caused by discontinuities in a digital waveform. Although these sounds

arrive at the surface of a recording/processing medium, many artists draw on the entropic internal workings of audio processing systems - often carefully entangled networks of hard and/or software. A kind of sonic residue emerges, refracted from its source into subtle decay-patterns (cf. <http://www.anechoicmedia.com/residualism2.html>; cf. also Amanda Steggell and Per Platou's Glitch Festival held in Norway 11-13 January, 2002: <http://www.liveart.org/>).

The inframedia approach I sketched above would seem to work more on a "formal," abstract level of data-reflexivity, thus evoking perhaps the specter of modernism or even the kind of self-reflexive scratching we see in recent video art (Nam June Paik, Douglas Gordon, Paul Pfeiffer). Or, rather, it would seem to appeal to a more maverick understanding of the *informe* (formless) - the persistent/undercurrent performative and operational force within the history of modern art which Bataille saw as slippage, ink spots, or quacks, sliding outside the opposition of form and content (cf. Yve-Alain Bois/Rosalind E. Krauss, *Formless*, New York: Zone Books, 1997). But we have not yet seen it in very often, if at all, in interactive dance or digital dance. One the questions that remains open, then, is the way in which we can delineate this inframedia slippage process (hypermediated digital dance-images) for dance and make it understandable as a dancemedia.

What equivalencies in dance might there be to the experimentations in digital audio, for example this manipulation of hypermediated audio material, with errors, slips, accidents, and entropy as deliberately cultivated material that can be worked into textures? In audio art, for example, some of the results of this texturing can be surprisingly beautiful, in spite of the disintegrated or broken materials, and we have noticed the same in our ADaPT telepresence performance contacts, when movement-images become surreal architectural blobs and blotches. The sound artists tend to pay close attention to sonic textures and timbres, to layering and recompositions of elements, to repetitions (loops), and various elements cycling against and through each other as well as evolving as spirals, small cycles nested into larger cycles, etc. One effect of accumulation lies in the duration of these cycles: macroscopic change is a product of accumulated changes in the micro-elements. At other times there is collapse, breakdown, interruption and disintegration of the material. The code or machine language is shredded or decompiled; deliberate mistakes in the programming produce unexpected but fascinating qualities. Thus there are gentle cycles of sonic build and decay, but also of violent gaps, cuts, bursts of noise and silence.

What I have just discussed are impressions I have taken from the constructed landscapes and environments of real-time sound inframedia; they are surface features and structural features that reflect a practice which has an aesthetic/compositional/improvisational or architectural vocabulary just as we saw it in Tinapple, Roesler, and Ainger's demonstrations. Before I end with a description of this work's affective power, I want to ask whether we have a vocabulary of inframedia practice for digital dance -- I think not, and this is perhaps the decisive disadvantage of dance as a partner in interactive system design: dancers and choreographers are generally working in real-time space, which is its own self-referential system, and not on the material level of digital datastreams derived from dance. In order to make a transition to another system, the idea of mapping dance data (cross-platform/cross-systems data transfer and synthesis) would have to gain wider acceptance into the practice of choreographers/dancers or into their collaborations with digital artists.

Constructed, processed dance emerging in interactive environments - what does it look like? How does inframedia work in real time and space, how does it translate into sensory experience?

Whitelaw's astonishing description of inframedia audio persuasively refers to a synaesthetic experience that connects it to dance/dancing:

In performance contexts, sound systems and volume levels are tuned for a balance between aurality and corporeality; so too are the sound palettes. Low frequency drones, rumbles and pulses are prominent, and vary in their effects from hollow abdominal shocks to gentle seismic flows; crackles, clicks and hisses go straight for the ear and the head; in between the warm, overdriven midrange (as found in the work of Minit, David Haines, Vicky Browne and others) works like a phantom voice in the thorax and sinuses. So the body vibrates, is pushed, pierced, bathed, occasionally assaulted; these are textures and flows of sound but also of shared sensation, moving through a specific space and duration. Extended repetition creates plateaus of acclimatization, a soaking-in process; attention moves to the audio's interior structures, and to psycho- and physio-acoustic processes. Temporal perception loosens; subjective durations alternately compress and expand. The performance acts as a mesmeric soundfield, an involving process which opens lateral spaces for thought and affect.(2)

This report (from Australia) came back to my mind to haunt me after the experience of the Think Tank and the questions it raised for many of us, including the doubts we may also have concerning the interactive future of dance. Some members of the public audience asked about the aesthetic merit of interactive systems, and how they would become integrated and productive for new (or old?) choreographic processes. For digital artists, this would be a surface question only. Dance, to my knowledge, has not yet been explored on the level of the subsurface, even though we might argue that it is inside of our bodies, in our nervous system itself.

Notes

(1) For helpful literature on Oiticica and participatory performance, see the exhibition catalogues Out of Actions: between performance and the object, 1949-1979, with essays organised by Paul Schimmel. The Museum of Contemporary Arts, Los Angeles. New York: Thames and Hudson, 1998; and Hélio Oiticica. Galerie Nationale du Jeu de Pomme, Paris, with Projeto Hélio Oiticica, Rio de Janeiro and Witte de With, Rotterdam, 1992. The exhibition "Hélio Oiticica: Quasi Cinemas," organized by Carlos Basualdo, was shown at the Wexner Center for the Arts, September 18- December 30, 2001. For an analysis of the relations between architecture and digital performance, see my "Suite Fantastique," <http://www.location1.org/ossa/index.html>. On the subject of "wearables," see New Nomads: An Exploration of Wearable Electronics. (Rotterdam: o10 Publishers, 2000).

(2) He concludes by suggesting that such audio art, although it shows up "the opacity of the medium, flawed technology, failed and false representation," is fundamentally reconstructive. "It spins artefactual audio out into rich and complex streams, which are rarely composed or formally determined 'works,' more often durations felt out, traversed through improvisation, real-time processing and sensory/kinaesthetic feedback cycles. In that process the transgressive quality of the glitch, the click, or the exotically artefacted sample, fades. There is nothing for it to rupture, no clean surface to crack, just a buzzing cloud of other artefacts. When it's no longer an error or a failure, the artefact is simply the self-identifying sound of the media substrate, something approaching a raw apprehension of the signal, the microactivity of fluctuations in data and/or voltage which subtend digital and electronic media. So what gets reconstructed is an aesthetic whole, certainly, but more interestingly it's one which works with the sensory and affective textures of a media substrate, rather than media 'content.' This aversion to 'content' is evident here in the prominence of process and improvisation.... There is often a reluctance to make a mark or a gesture, soundfields are carefully balanced 'grounds' of microfiguration, immanent activity, and (near) stasis. Once again this formal tendency has an experiential side; this rich absence opens an

undetermined temporal hollow...This process draws out the media substrate, the subsurface infrastructure, out into the material world, into temporal, kinaesthetic and affective experience.” Cf. Whitelaw, “Inframedia Audio: Glitches and Tape Hiss, p. 50. In my research on the “image instrument,” conducted in the context of the telepresence experiments at OSU, I am also indebted to Lev Manovich, *The Language of New Media* (Cambridge, MA.: MIT Press, 2001), pp.164-75.