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"Performing" Interactivity

The viewer completes the work of art.
—MARCEL DUCHAMP[1]

Theories of Interactivity

All art is an interaction between the viewer and the artwork, and thus all artworks are interactive in the sense that a negotiation or confrontation takes place between the beholder and the beheld. Andrew Benjamin maintains that the artwork is not so much the object in itself "but the continual questioning of the object . . . the sustained presence of the work, part of whose work is to raise and maintain the question of the [work]."[2] Where digital interactive artworks and performances differ is in the ability of the user or audience to activate, affect, play with, input into, build, or entirely change it.

Audience participation in performance goes back millennia to tribal rituals and communal dances, and the futurists were the first in the twentieth century to systematically initiate performances that relied upon direct interaction from their audiences, typically using conflict and provocation to incite the spectators into action. In 1909, two months after the publication of the first futurist manifesto, Marinetti strategically booked the Théâtre de l'Oeuvre in Paris, where Alfred Jarry's *Ubu Roi* had caused a near-riot in 1896, to present his own satire on politics and revolution *Roi Bombance*.[3] Though it failed to ignite Jarry's violent reaction and fisticuffs, subsequent futurist performances would prompt police arrests of performers, and the almost commonplace audience response of throwing fruit and other missiles at the stage, once famously prompting Carlo Carrà to scream, "Throw an idea instead of potatoes, idiots!"[4] The deliberate double booking of theater seats, and the smearing of glue on them, ensured reaction and interactivity between audience members in auditoria, and actions such as the burning of national flags fueled noisy interventions between spectators and performers. Marinetti encouraged performers

to provoke and enrage audiences through a display of open disdain for them, and his publication *War, the Only Hygiene* (1911–15) included a manifesto celebrating "The Pleasure of Being Booed."[5]

In what David Saltz describes as "a remarkable anticipation of Internet culture,"[6] in 1932 Bertolt Brecht wrote about the interactive potentials of radio which could be brought about through "a vast network of pipes." Radio, he said, could develop the capacity to learn "how to receive as well as transmit, how to let the listener speak as well as hear, how to bring him into a relationship instead of isolating him."[7] Today, Brecht's words are printed large to dominate an entire wall in the main office of BBC's popular talk radio station *Five Live*. In 1962, McLuhan introduced the concept that "interfaces means interaction,"[8] and since then different definitions of interactivity have come thick and fast from both academics and artists. For Andy Lippman it is "mutual and simultaneous activity on the part of both participants, usually working towards some goal . . . but not necessarily,"[9] and Simon Penny's more technological definition equally emphasizes real-time response: "An interactive system is a machine system which reacts in the moment, by virtue of automated reasoning based on data from its sensory apparatus . . . Interactivity implies real time."[10] Janet Murray stresses its important relationship to ideas of agency: "the satisfying power to take meaningful action and see the results of our decisions and choices."[11]

In relation to digital arts and video installations, Margaret Morse suggests the interactive user takes on "the virtual role of 'artist/installer' if not the role of artist as declarer and inventer of that world."[12] Bolter and Gromala offer the substitution of the word "performance" as "an even better word than *interaction* to describe the significance of digital design in general. As users, we enter into a performative relationship with a digital design: we perform the design, as we would a musical instrument."[13] Although this is a potent and apt metaphor for certain installations, we would note its slight hyperbole: one generally plays a musical instrument, one does not perform it, and there is a significant difference between the two concepts. Jaron Lanier continues the performative theme using a dance metaphor, and sees interactivity as an aspect of content:

> Interactivity is a style of concrete conversation with the media. It is the way you dance with the computer. . . . [The] visual is not important. What is important is the rhythm of interaction . . . that feeling is not easy. Certain people can do it, rather like artists. . . . It is a new art form. . . . We don't entirely know what interactivity is yet.[14]

Leading theorists of interactive art such as Peter Weibel and Söke Dinkla have discussed different levels and degrees of interactivity, from simple stimulus-response closed modes to highly flexible open models. Dinkla presents a poetic definition of advanced examples to conceive open interactive artworks as floating phenomena, and coins the phrase the *floating work of art*:

> Part of the authorship transfers from the artist to the user in the *floating work of art*. . . . In the cybernetic circle his own gaze, which is determined by social conventions, is thrown back at him and makes him realise that it is he who generates reality with his gaze. In the *floating work of art* the user becomes conscious that he is an accomplice in a fundamental sense. However, he only seemingly occupies an omnipotent position that allows him to control events, since he is always victim and perpetrator at the same time. In a web of relations he is only one of many controllers. . . . The *floating work of art* is no longer the expression of a single individual. Neither is it the expression of a collective, but it is the state of a "connective"—a web of influences that are continually reorganised by all participants.[15]

But "interactivity" is a much used and abused term, and one which by the turn of the millennium had become an increasingly meaningless buzzword in myriad contexts. Andrea Zapp makes the point that interaction now "codifies a post-modern aesthetic slogan, which describes a technical condition as 'dynamic hands-on-experience.'"[16] But levels of interactivity were and are often highly exaggerated in the marketing of both commercial products and, in many cases, artworks. If one turns on a light switch, the process is interactive—something is received in exchange—but no real dialogue takes place. In precisely the same way, many and arguably *most* products and artworks dubbed "interactive"—for example, the majority of CD-ROMs—should more accurately be termed "reactive."

Interactive multimedia applications including installations, CD-ROMs, the Web, and games, are seen as a decisive break from the hegemonic single-track delivery of mass media, particularly television, a generally one-way transmission-reception form that, in Hans Magnus Enzenberger's words, "does not serve communication but prevents it. It allows no reciprocal action between transmitter and receiver."[17] Baudrillard characterizes the mass media as "anti-mediatory and intransitive. They fabricate non-communication . . . if one agrees to define communication as an exchange, as a reciprocal stage of a speech and a response, and thus of a responsibility."[18] He argues that mass media are set up precisely to exclude response and that "we live in an era of non-response—of irresponsibility"[19] where television's very presence is a form of Orwellian social control since it ensures people are no longer speaking to one another.

Since television predominantly operates one-way, when a television presenter directly addresses the viewer, we perceive the presenter on screen, as in most instances we do with the performer in theater and performance, as a third-person "he" or "she" rather than the "you" of real-life interaction (because the television viewer is acknowledged but unrecognized). But in interactive installations and performances where the user/audience member is directly addressed and can respond meaningfully, the performer becomes a "you," operating in the second person rather than the third by nature of the direct interaction with the viewer, even when the performer is mediatized on a screen.[20]

Augusto Boal and the "Spectactor"

In *The New Media Reader* (2003), a performance maker not normally associated with digital technologies provides a key chapter and is introduced as a seminal figure in the theory and practice of interactivity—Augusto Boal. He is also introduced as someone who, unlike other interactive practitioners featured in the book, has been jailed and tortured for his practice, and has seen his colleagues murdered by the Brazilian military government. Noah Wardrip-Fruin notes the importance of his emphasis on embodiment in his interactive techniques employed in "forum" and "invisible" theater and speculates on whether Boal's methods can go toward overcoming the spectator/actor divide in digital contexts and Baudrillard's encoder/decoder binary.[21] He relates the politicized interactions of Boal's live invisible theater events to digital artists such as the ®TM ark group, "which uses the protections it gains as a limited-liability corporation to support 'the sabotage (informative alteration) of corporate products, from dolls and children's learning tools to electronic action games' often in such a way that those encountering the products are not aware of the alteration."[22]

We would also draw attention to the important political activism of the Electronic Disturbance Theatre who famously brought the major corporate toy company eToys to its knees following its "theft" of the *eToys* domain name from a group of net artists who had originally registered and used it. The Electronic Disturbance Theatre won the "eToys War" by mobilizing an army of literally thousands of Web artists, liberals, and activists, who logged in to the ordering area of the toy company's website not to buy, but to clog and crash it. Their sales went into freefall (like Amazon, they are a virtual company only), and they were finally forced to capitulate and give back the domain name and URL to the artists.

Gonzalo Frasca has discussed Boal's poetics in relation to establishing deeper senses of characterization and situation in virtual environments and games, to create something approaching "The *Sims* of the Oppressed."[23] The reference relates to Boal's popular book *Theatre of the Oppressed* (1985), where he rejects Aristotelian notions of theater, calling it "*the poetics of oppression*: the world is known, perfect or about to be perfected, and all its values are imposed on the spectators, who passively delegate power to the characters to act and think in the first place."[24] In doing so, Boal suggests, spectators substitute dramatic action for real action, and remain oppressed. Even the "enlightened vanguard" of Brecht's theater, while revealing the world as subject to revolutionary change on the level of consciousness, does not operate on the level of action for the spectator. But by becoming a participant, or *spectactor* (a term he coins and then acknowledges immediately as "a bad word!") the spectator ceases to delegate power to other characters and theater is transformed from passivity into action: "The spectator frees himself; he thinks and acts for himself! Theatre is action!"[25]

Interactive performance concerns mutual obligations and ethics between performers and spectators, in the same way that these have operated in live art, for example in the

work of Marina Abramovich in the 1970s. Abramovich's series of *Rhythm* works sometimes required the audience to intervene and save her life: after she fell unconscious through smoke inhalation in the center of a fire in *Rhythm 5* (1974), and when a loaded gun was held to her head by a visitor in *Rhythm 0* (1974). In the latter performance, visitors interacted with her using various props set out in the space (from feathers and flowers to knives), and Abramovich's stubborn passivity led both to interactions of great trust and sensitivity (such as visitors adorning her) but also of abuse, with her flesh being cut and her blood drunk.

Andrea Zapp suggests that in interactive experiences, "the former audience is lifted out of their seat of distanced contemplation and placed in the limelight of subjective physical involvement: addressed as a storyboard controller, co-author actor or self-performer."[26] This characterization is true of certain installations and performances—and of certain users—but as a general "rule" or understanding of interactive works, it is overstated. As we have seen, a spectator's reception of screen media differs significantly from live performance modes, and for (probably most) interactive installations Zapp's image of a spectator levitating from her seat to move onto a theater stage (in the limelight) is exaggerated on two counts. First, as we have seen, the spectator of live performance is not in the same state of "distanced contemplation" as they are for screen media. Second, most people would abhor the idea of being transported onto a stage to take part in a theatrical performance they have no knowledge of—that is literally the stuff of nightmares.

Defining Categories and Levels of Interactivity

A number of commentators have offered distinct categories and continuums of interactivity, and we offer our own four categories that we feel are helpful in relation to distinguishing different types of interactivity in artworks and performances. As in our presentation of different categories of "The Digital Double," this approach helps to structure discussion and to focus on particular features within an enormously wide and diverse field of practices. The four types of interactive art and performance we discern are ranked in ascending order in relation to the openness of the system and the consequent level and depth of user interaction:

1. Navigation
2. Participation
3. Conversation
4. Collaboration

Some categories may seem on the surface to be too similar or slippery, crossing over one another too easily—for example, what distinguishes participation from conversation, and isn't a conversation in essence a collaboration? But if we take as an example an interactive work discussed in chapter 11, Stelarc's *Prosthetic Head* where a projected

computer-generated 3D head answers questions asked by the visitor, we can see how our classifications of interaction work in hierarchical order. In doing so, we would stress that our hierarchies of interaction and the incremental levels of a user's creative freedom they delineate are in no way relative to an individual artwork's quality, originality, or impact. Advanced collaboration is not necessarily "better" than multiple-choice navigation, it is simply *more* interactive. Indeed, as David Rokeby notes, interactive users normally favor artworks that are relatively structured and constrained, where choice and navigation is focused rather than wide open: users only want a modest level of freedom. He goes on to point out that in any case the sense of freedom in interactive systems is primarily symbolic: "An interactive artist can give interactors the impression that they have much more freedom than they actually do."[27]

Prosthetic Head's interactivity is clearly more than simple navigation, and while it is of course participatory, the level of interaction is deeper and more sophisticated than simply joining in. A genuine and meaningful dialogue between the user and the artwork takes place (a literal one in this case) and thus it is a type of conversation (figure 23.1). But we

Figure 23.1 Stelarc's *Prosthetic Head* (2002) enacts a genuine and meaningful dialogue with the user, and hence we categorize it within our third category of interactivity: conversation. Programmed by Karen Marcelo and Sam Trychin, 3D models by Barrett Fox.

feel that it does not reach the level of a true collaboration, our final category. This is because the user is essentially interacting with the artwork on *its* pre-programmed terms (in this case, "you ask a question, I'll answer it") and the user's input will never meaningfully alter the artwork itself, or build and construct "new art" in collaboration with the computer or other users. Some may disagree, arguing that the dialogue between the user and the *Prosthetic Head* is new art since it will be quite unique (or certainly parts of it will) and is therefore truly collaborative. We would acknowledge the point, but counter that within our classifications there are more genuinely collaborative models in interactive arts where the user's input is freer, more open, and more *significantly* changes what happens. Degrees of significance and change effected by the user in interactive spaces and performances are judgment calls and matters of opinion, and we are the first to recognize that these categorizations (like the most responsive interactive artworks) are not an exact science.

We have already discussed numerous interactive works in other chapters, and will not return to them here simply to place them in one or other category; and in later chapters we analyze interactive CD-ROMs and computer games. The interactive paradigm of CD-ROMs is quintessentially navigational, where the territory is pre-programmed and (normally) set in stone, and interactivity is limited to the user choosing (or guessing) a path through the material or virtual environment. Some CD-ROMs, such as Laurie Anderson's *Puppet Motel* (1995) also offer participatory activities in gamelike forms, while others such as Igloo's *Windowsninetyeight* (1998) enable users to manipulate images creatively. The diversity of computer and video games offer paradigms that threaten to blast open the categories. It has been said that games are the most truly interactive digital applications of all, since response is immediate and absolute (click left and you move left), but they are generally still set within very rigid rather than fluid parameters. All are navigational (moving through spaces), but we would characterize most solo games as participatory, as they involve active involvement in a complex activity, rather than the "A or B?" paradigm of navigation. We would not consider solo game-playing conversational since although a type of dialogue is clearly going on between the gamer and the program, the software rarely offers real flexibility to the dialogue, and although it may be "intelligent" and do different or unexpected things from game to game, communication is not "open." Where two or more users play one another, in real space or online, and particularly where they work together as teams, a more conversational interactivity comes into play. What we term the collaboration paradigm is rarely evident in games since game worlds tend not to be flexible enough to admit genuinely new ideas. But this is changing with more advanced programs, and there are also a number of well-established game environments where gamers collaborate to meaningfully alter the structures, architectures, and activities of the game world.

Navigation

REMEMBER, THE END IS
JUST THE BEGINNING.
—LYNN HERSHMANN, SCREEN INSTRUCTION FOR *LORNA*, 1979–84

Navigation, the "simplest" form of interaction, is epitomized by the single click of a mouse to answer "Yes or No" to a screen prompt, or to indicate "Right, Left, Up, or Down." In gallery installations it may be the pressing of a button or, as in as Claude Shannon's early interactive artwork *The Ultimate Machine* (1952) "pull a switch, a lid opens and a hand emerges that throws the switch in the off position whereupon the lid closes again over the hand."[28] The navigation model is nowadays increasingly at play within television, where audiences use their remote controls, telephones, or computers to steer the direction of programs that rely on voting to decide winners (*Pop Idol*) or losers (*Big Brother*). A referendum modeled on the principles of Western democracy, telephone voting offers "the people's will." This strategy is a direct response by broadcasters to perceived "interactive" needs of audiences brought about through increased exposure to multimedia applications and the Internet—an ironic move, for when those same technologies first emerged, they remediated television paradigms and techniques.[29] Robin Nelson coins the term "flexi-narrative" in relation to popular television serials and series, and notes how television has increasingly adopted the paradigms of interactive narratives: "the fast-cut, segmented, multi-narrative structure which yields the ninety-second sound-and-vision byte form currently typical of popular television drama."[30]

On stage, audiences assist the navigation of live performances such as Dana Atchley's solo *Next Exit* (1991), where he sits next to a video-projected campfire and creates a unique performance for every audience by selecting from seventy stories in his "digital suitcase." Atchley, an obsessive documenter who has kept every photographic image he has taken since the age of seven, stresses the positive impact of new technology on both documentation and the ancient art of storytelling. An organizer of digital storytelling festivals and cofounder of the Center for Digital Storytelling, he wonders whether "cemeteries of the 21st century will be filled with interactive kiosks of lives lived?"[31]

On the Web, navigational interactivity is the very act of surfing and includes interaction with varied net.art pieces and hypertext narratives. A large number of interactive stories, video interfaces, and online "dramas" have emerged on the Web. In historical terms 1996 was the key year, with the emergence of three different photoplay soap operas. These included sixteen episodes of a gay soap *Fatal Beauty*, and *The Spot*, reputedly the first soap on the web, which began early in 1996 and ran for almost two years. *The Spot* centers on a group of friends sharing a beach house in Santa Monica, California. Although its narratives are conventional, it makes relatively effective use of its nonlinear fictional form, and incorporates different media. Episodes include video and audio clips, photo albums,

Figure 23.2 Mika Tuomola and Heikki Leskinen's early online interactive drama *Daisy's Amazing Discoveries* (1996).

access to character's journals, and navigable tours around the house to familiarize users with its layout.

Daisy's Amazing Discoveries, a five-part nonlinear interactive drama, also came online in 1996, and was in its day by far the most theatrical and artistically sophisticated example of the genre. The ambitious, state-of-the-art Finnish production (in English) traces Daisy's journey as she leaves a traveling circus to pursue her romantic dreams in the city. It is innovative in both concept and design, with imaginative interactive elements, and some stunning and elaborate photomontage interface screens created in *Photoshop* (figure 23.2). Some are digital composites of up to twenty-five photographs, which scriptwriter Mika Tuomola and director Heikki Leskinen aptly describe as "almost photorealistic pictures of a fantasy world."[32] The rich and surreal screen environments enable a range of routes through the narratives; for example, clicking on different paving stones on a road winding into the distance reveals twelve separate scenes. In addition to the photomontage environments, the production incorporates text-and-image collages, audio dialogue accompanied by photographic slideshows, music, and a small number of video clips. As each episode was released on the web, users could move up a level of interactivity to become participatory. They could affect the action in the next episode by writing to the fictional world's lifestyle magazine, by scrawling graffiti messages in the restroom of the bar, or by entering the environment's chat room.

More recent examples include the BBC's ambitious interactive soap *Thunder Road*, which was screened in 2002 on broadband TV and subsequently on the BBC1 website, where audiences were provided with extra information, interviews, and subplot developments and could take part in chat-room discussion forums. Performance art duo Desperate Optimists' *Lost Cause* (2000) is a ten-part Web sci-fi narrative telling the story of a woman's journey through a futuristic city to blow up the headquarters of the Chemi-drome Corporation. Characterized by the company's imaginative and intelligent approach to new media performance, it features an evocative musical soundtrack and specific visual homages to classic sci-fi movies, including *La Jetée* (1962) and *Alphaville* (1965).

Interactive Cinema

Cinema needs new tools.
—BERTOLT BRECHT[33]

Navigable moving image narratives, of which there are many types but which we will generically call "interactive cinema," have developed slowly but surely within the art world through CD-ROMs, interactive installations, and online narratives, while commercial endeavors have had a considerably more troubled time, as we will see. Lynn Hershman has been one of the leading interactive narrative artists for over twenty years, and her videodisc installation *Lorna* (1979–84) is widely regarded as the first "new media" interactive fictional artwork.[34] Though laser disc systems work without the aid of a computer, their speed offers comparable real time navigational properties in manipulating video footage. Users are asked to help Lorna, the protagonist, who dares not leave her room because she has become increasingly frightened by TV news reports, and so sits isolated in her apartment watching television (a vicious circle). As Söke Dinkla observes, "The simultaneity of active and passive roles in one person—controlling and being controlled—becomes clear right at the beginning, when the visitor, with a remote control in his or her hand, faces Lorna, also equipped with a remote control. . . . Paradoxically, they (the viewers/visitors) are asked to free Lorna from her plight using precisely the media which increases her fears"[35] (figure 23.3).

The user can affect the narrative as it unfolds, including its ending, where one can select between positive, negative, exciting, or ironic twists. New media art historian Hans-Peter Schwartz suggests that in doing so, *Lorna* "did no less than a change in paradigm, long overdue and well-prepared." Hershman's next videodisc, *Deep Contact: The First Interactive Sexual Fantasy Videodisc* (1984), was programmed using Hypercard, and has fifty-seven narrative segments and a touch-screen interface combining a Microtouch monitor and a Macintosh IIcx. Navigation depends upon users touching different parts of the screen body of the protagonist, Marion—the words "Touch Me" appear alongside Marion's image in the opening screen (figure 23.4). Touching her head opens options for different TV channels that humorously analyze female reproductive technologies and their

Figure 23.3 A typical screen image from Lynn Hershman's pioneering videodisc installation *Lorna* (1979–84).

Figure 23.4 The user is invited to get physical with the touch-screen interface of Lynn Hershman's early interactive Hypercard narrative *Deep Contact: The First Interactive Sexual Fantasy Videodisc* (1984).

effects on women's bodies, as well as notions of phantom limbs. Touching Marion's legs moves the narrative to a garden where the user progresses along forks in a path to follow either Marion, a Zen master, a demon, or an unknown path. As its title suggests, *Deep Contact* also enables one to examine aspects in detail: zooming in on a bush in the garden, for example, reveals a spider busily weaving its web. Users also need to manipulate the videodisk to reveal certain hidden elements, for example, all the dialogue spoken by the Zen master is in reverse, and the user has to play it backward to make it comprehensible. A surveillance camera directed on the user in the gallery is employed to map the visitor's image into the screen image, displacing the expected image, and playing with notions of "'transgressing the screen' and of being transported into 'virtual reality.'"[36]

Other art pioneers of the genre include Glorianna Davenport, who undertook early installation-based experiments as director of MIT's Interactive Cinema Group, and Grahame Weinbren, whose interactive movies are perhaps the most celebrated of the genre's early development. For Weinbren's *Sonata* (1990), the viewer sits in a steel cube in front of a monitor and can slide and overlap two complementary film narratives through the use of a custom-built picture frame that they point and move in relation to the screen. The two film narratives explore themes around lust and murder, one based on the Biblical Judith and Holofernes story, the other on Tolstoy's *The Kreutzer Sonata* (1890).[37] Peter Lunenfeld notes the moments prior to the climactic murder of the adulterous wife by her jealous husband in the Tolstoy plot. As she plays the violin in the music room, he seethes with rage outside the door and (using the picture frame device) "the user can 'slide' either perspective however far 'over' the other he or she chooses. This allows for a kind of simultaneity that the classic montage between the two scenes would not."[38] Weinbren himself suggests that

> The major feature of interactive cinema . . . is that the viewer is in a conjunctive state, i.e. he remains conspicuously aware that there are, 'behind' or below every picture, other pictures and pictorial systems which do not necessarily become visible in each individual presentation of the work. If this awareness can be turned into a conception that these background pictures make up the pictorial systems visible on the screen, then we will have a non-linear narrative corresponding to Freudian dream interpretation.[39]

More recently, Jill Scott has become one of the most prominent and innovative artists in the interactive cinema field, with important works such as *Frontiers of Utopia* (1995). Like the first act of Carol Churchill's play *Top Girls* (1982), *Frontiers of Utopia* features eight women from different historical periods brought together around a table (figure 23.5). Her other works include multiscreen interactive narratives constructed in large public spaces that explore her central themes of history, women, the body and technology. Interactive "films" have also been developed on the Web by a number of artists, the first of which, according to Christiane Paul, was David Blair's *WAXWEB* (1993), an

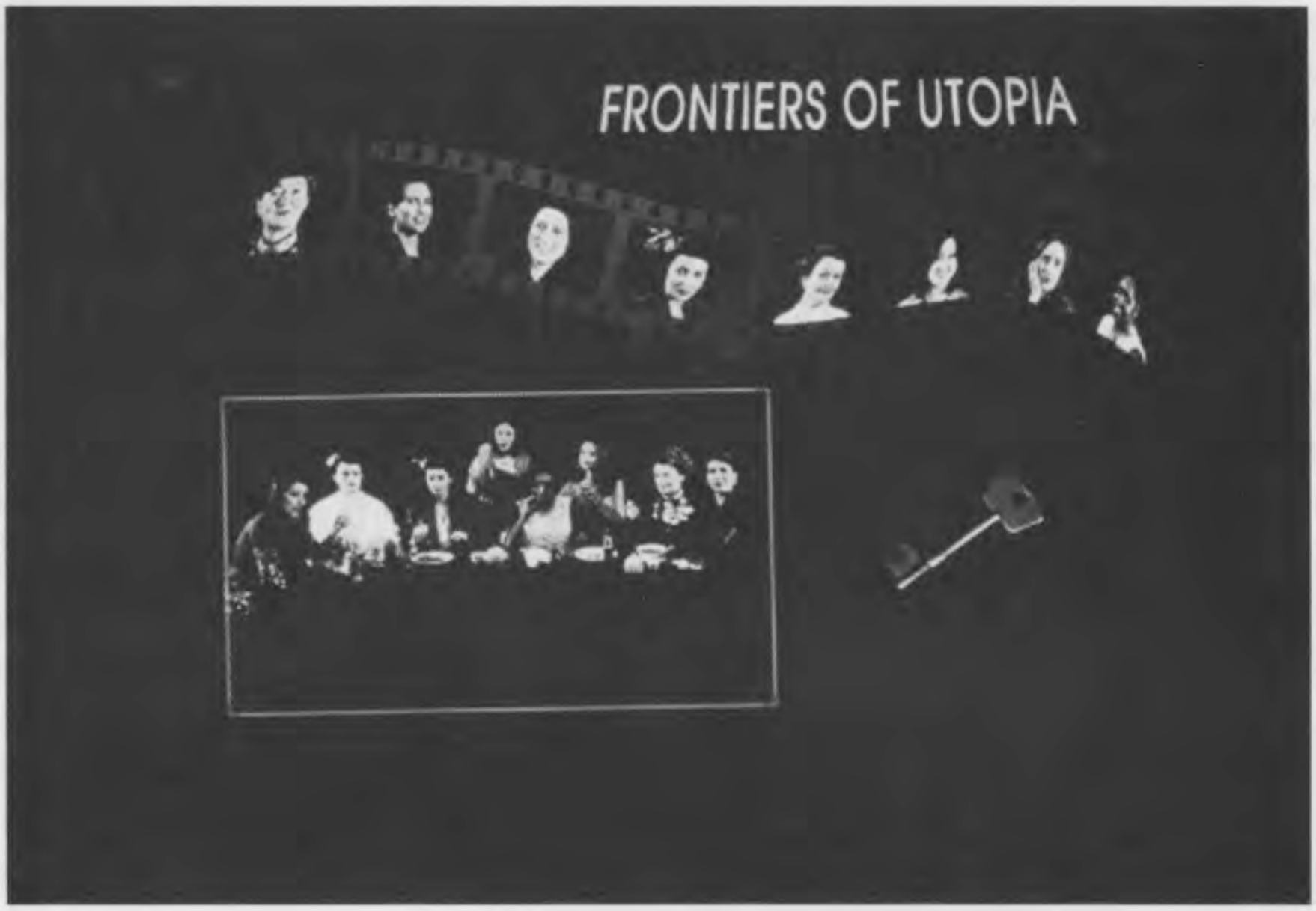

Figure 23.5 A screen shot from Jill Scott's interactive cinema installation experience *Frontiers of Utopia* (1995).

eighty-five-minute movie reflecting on the history of film and television, constructed within a database of eighty thousand pieces that Web users can assemble in different orders.

Interactive Movies: Commercial Experiments

New technologies have provided cinema with tools to create extraordinary graphical and quasi-photographic special effects, which have created visually stunning artificial worlds, from the ancient (*Gladiator*, 2000; *Lord of the Rings*, 2001–2003) to the futuristic (*The Matrix*, 1999; *Minority Report*, 2002). New technologies have helped minimize danger to stunt artists (or to replace them completely with "synthespians") and equally to replace dead actors (Oliver Reed in *Gladiator*) and expensive human extras through the use of cut-and-paste composite crowd scenes. For movie producers and studios, computers and cinema may seem like a marriage made in heaven, but their ultimate consummation in the much-vaunted idea of interactive cinema is a deeply troubled one.

In 1967, the movie *One Man and His World* played at Expo '67 in Montreal. Before its climax, the audience was able to vote to determine the endings it wanted: "Should the wife or the blond neighbour commit suicide? Should the male protagonist go to jail or go free?"[40] The audience cast their votes in 1967, but since then there have been only a tiny number of repetitions of the idea in movie theaters. Marie-Laure Ryan argues, "The

biggest obstacle to the implementation of selective interactivity in movies and drama is the conflict between the solitary pleasure of decision making and the public nature of cinematic or dramatic performance. In a spectacle addressed to a large audience, interactive decisions must be taken by the majority, and freedom of choice is only freedom to vote."[41] Allen Yamashita similarly draws attention to the frustrating and unsatisfactory blunt instrument of majority rule:

> Attempts at interactive speciality entertainment can be described as "dumb" interactivity. These include movie products in which the audience gets an A/B choice at plot turns and at the ending; guests "interact" with a couple of buttons hardwired into the backs of seats. As group experiences, such products seem doomed to disappoint the half of the audience who didn't want to go "left" at the fork in the story and to bore those who simply didn't care and wanted the storyteller to get on with it.[42]

The first commercial examples of interactive movies delivered outside of movie theaters were generally hybrid game-dramas primarily linked to game consoles, with gaming being the dominant activity, interspersed by movie footage inserts. Notable early examples include *The 7th Guest* (1993), *Myst* (1993), *Wing Commander III* (1994), *The 11th Hour* (1995), *Phantasmagoria* (1995), and *Harvester* (1996). *Gabriel Knight: Sins of the Fathers* (1993) incorporated the voices of well-known actors Tim Curry and Leah Rimini, but movie footage was absent until the sequel *Gabriel Knight: The Beast Within* (1995), a package of six CD-ROMs. The leads were replaced with Dean Erickson and Joanne Takahashi, and the "supernatural psycho-thriller" brought together werewolves, a murder mystery, and the death of "Mad" King Ludwig II.

Interplay Productions' *Voyeur* (1994) was first released on CD-I by Phillips Interactive Media and later as a CD-ROM. Like a remediation of Hitchcock's *Rear Window* (1954), the user is located in an apartment spying on the affairs of others (this time with a video camera and telescope). The gamer has a race against time to collect video evidence to either prevent a murder or prove the murderer's identity, as he or she follows the activities of presidential candidate Reed Hawke and uncovers the family secrets of affairs, betrayals, and blackmail. The game/movie is played in one sitting (with fading batteries and timers ticking to remind the player that time is fleeting); and a restart offers some limited changes and a new victim. The pornography industry, inevitably, was also riding the interactive cinema wave from the start, with numerous CD-ROM titles in the mid-1990s, and later DVDs such as Digital Playground's *Virtual Sex, with Jill Kelly* (2000), which subtly invited interested parties to "interact with her using your DVD remote! You choose the sexual positions! You choose the camera angles! You choose her moods between innocent and nasty! You ask her to strip naked for you! You ask her to tell you her wildest sex stories . . . enjoy this gorgeous sex animal and enjoy her countless times. The Virtual

Sex Series has redefined interactive sex." However, such interactive movie paradigms have not significantly taken off in the sex industry, and although *delivery* of pornographic movies has moved to digital formats (DVD and via the Web), traditional linear-narrative fornication still currently holds the day, and the dollars.

The Interfilm Technology company first experimented with interactive cinema in 1992, enabling cinema audiences to vote for narrative path choices using pads on the arms of their theater seats in films such as *I'm Your Man* (1992). But the experiments did not succeed commercially, and "after an initial success due to the novelty of the experience, audiences quickly tired of this form of artistic democracy."[43] But with the advent of DVD, the genre entered a new phase which replaced the limitations of interactivity based on the tastes of a democratic majority with the ability for users to take their own individual paths through the narratives. Interfilm Technology restructured *I'm Your Man* and released it as an interactive DVD in 1998 directed by Bob Bejan, and it is widely regarded as the first of its genre of interactive cinema. Its publicity suggested a considerable and highly dramatic paradigm shift: "Climb into the director's seat and make the movie you want to see! You pick the characters and choose what happens to them. You control everything with the push of a button. Multiple plots, multiple endings—its interactive moviemaking so real the only thing missing is the studio accountant."

In the event, *I'm Your Man* was a fairly crass and cliched comedy action thriller using fifty-six different film segments and offering users twenty-five decision points where they could choose which of the three main characters to follow (a seductive villain, a naïve ingenue, and a young hero). For the climax, two of the characters each break the fourth wall and speak directly to the viewer, the villain asking if he should "turn into an FBI agent" or "run like a rabbit," the ingenue questioning whether she should be a "good girl" or a "bad girl." The drama of intrigue, sinister computer disks, and a murder plot is resolved when all the branches of the story are, in Ryan's words, "interrupted by the *coup de théâtre* of the common resolution: an FBI agent suddenly appears, like a deus ex machina, collects the disks from Leslie, arrests Richard, and congratulates Jack and Leslie on a job well done."[44] The viewer then has a choice of one of the three character's epilogues.

Ryan makes the point that like many interactive films, *I'm Your Man* has the problem that options necessitate a freezing of the screen until a decision is made, which "uproots the spectator from the fictional world and highlights the conflict of immersion and interactivity."[45] Noting the use of direct address to the viewer at decision points, she continues: "The predeliction of interactive works for modes of expression that involve an ironic distancing from the fictional world confirms Janet Murray's diagnosis of their built-in affinity for the comic spirit.[46] But if self-consciousness becomes the standard way to compensate for the anti-immersive effect of interactivity, it will take a lot of ingenuity to prevent the device from becoming a metacliché."[47]

Tender Loving Care

One of the veterans and pioneers of the commercial interactive cinema genre, David Wheeler, whose work had included *The 7th Guest* (1993) and *The 11th Hour* (1995), directed Aftermath Media's *Tender Loving Care* (*TLC*) in 1999. It was a significant raising of the stakes in the field: shot on 35 mm film, costing $700,000, and featuring a movie star (John Hurt); and at the time it seemed that interactive cinema was finally going to get the Hollywood treatment. Its DVD cover bore the tagline "Watch What You Wish For", and its back sleeve was filled with interactive hyperbole typical of the genre, but making some startlingly fresh claims:

> You are about to experience a fantasy quite unlike anything you've ever seen or felt before—a fantasy built from the very stuff of your own mind. . . . No two people will experience *Tender Loving Care* in exactly the same way. . . . The player is voyeur, detective, judge and patient all in one. Between each variable scene, Dr Turner enlists the viewer's help in assessing the behaviour of the film's characters . . . [and] the viewer too becomes one of Dr Turner's patients, taking a series of Thematic Apperception Tests (TATs), the results of which create a progressively accumulating psychological profile of the viewer.

Wow! We preordered our copy, put it into the machine the moment it arrived, and this is what we experienced . . . In the opening sequence, John Hurt, playing Dr. Turner, drives up to a large house, gets out of his car, and addresses the camera in his inimitably slow, intense, and considered tones. The essence is, "What happened in this house?" and his mood and delivery makes clear it is probably something very bad. We flash back in time to find Alison and Michael, an attractive middle-class young couple living in the house, apparently happy, apparently with a child unwell in bed upstairs, who Alison talks about and continually goes off to tend. Michael looks worried. John Hurt sends his best psychiatric nurse, Kathryn—a haughty, mysterious, and curvaceous blonde in a tight nurse's uniform—to live with them in the house "to look after the child," as she explains to Alison. Kathryn makes frequent visits to the child's room, seems a consummate professional, and one night takes off her blouse at the bedroom window while in the moonlit garden Michael stares up at her large, tastefully lit breasts.

Enter John Hurt:

> How did you feel when Kathryn undressed in front of Michael?
> Titillated; Amused; Offended; Intrigued; Uncomfortable.
>
> Do you look in people's windows?
> Yes; No
>
> Is Kathryn:
> Attractive; Hostile; Intelligent; Sympathetic; Mysterious.

I am a good person [*meaning you, the user*]
Yes; No

Is oral sex a crime?
Yes; No

Four-foot long penises are:
Funny; Offensive; Too big; Just right for me.

If I was a flea I would be a miserable depressed flea
Yes; No

Abortion:
Pro-life; Pro-choice; Don't have an opinion.

Such questions are posed and require a response every five minutes or so, when Hurt interrupts the movie. He generally comments on the preceding action, asks us to respond to questions about how we feel about the events, and sets us more questions to delve into our personal and sexual psyches: "At least once I have stared in awe at a horse's penis: True; False." We answer the questions, believing perhaps (but quite wrongly) that the DVD software is psychometrically profiling our very subconscious. Following these interrogations, we navigate around graphical representations of the rooms in the house and listen in to phone messages, read diaries on bedroom tables, look at Alison's medical notes, and so on, before returning to the movie. After nearly three hours we realize we've been answering questions, watching Alison's slightly crazed behavior and the dark, sexual chemistry brewing between Kathryn and Michael, and we're barely into the second act. Time for a break. But exiting the DVD prompts the program to make us write down dozens of cryptic numbers and letters so that our profile isn't lost.

Recommencing, we laboriously re-input the codes to page after page of onscreen prompts, and are then back into the epic at the point we left. The plot thickens. There is no child in the bedroom (surprise, surprise); she was killed in a car crash, Alison is in glazed-eyed denial, and Kathryn conducts some private therapeutic meditation sessions with her behind a locked door. Michael, suspicious, knocks on it and it opens very slightly (was that a flash of naked skin in the background?), and Kathryn's face appears, furious at the interruption. Enter John Hurt:

When Kathryn and Alison meditate are they naked?
Yes; No

Adam and Eve
True; Made up

I have bowel problems:
True; False

Is art pornographic?
Yes; No

What happened to Mr Roo? [*Onscreen graphic of a kangaroo on crutches*]
Got hit by a car; Fell off a slide; Got beat up by wallabies; Got caught being unfaithful by Mrs Roo.

Have you had a homo-erotic experience?
Yes; No

Let's cut to the chase. Michael finally overcomes his angst-filled ethical dilemma between his loyalty to Alison and his lust for Kathryn, and they have torrid, explosive sex (surprise, surprise). But Kathryn, who may (or may not) also be having an affair with Alison, turns out not to be a very nice person. To Michael's increasingly disturbed mind, Kathryn needs murdering with a shovel and burying in the garden. This is done, but crime doesn't pay, and the police and some white-coated types from the lunatic asylum take Michael away in a van. Cue John Hurt for a breathy, moralizing epilogue . . . and a few more questions. Curtain.

The film is absolutely dire, but the paradigm is fascinating. We decided to try it again some weeks later and input completely different answers to *all* the questions, this time as though we are nuns (we had in hindsight been a trifle "male" and red-blooded with our responses first time around). We watched again, feeding in an opposite psychological profile to before . . . and it was precisely the same film. Every single frame. We have since been assured by other *TLC* aficionados that there are some, though few, alternative sequences, and even a different ending if the right combinations of answers are made, but we really do not wish to suffer the movie again. That said, we honestly recommend it (particularly to those of an ironic disposition), as we have literally never seen anything like it before or since. Indeed, very few interactive movies have been made since, one suspects in no small part due to the big-budget, big-breasted flop of *TLC*. It remains a remarkable and unprecedented oddity in the history of both cinema and digital interactivity: unique, unforgettable, and hilarious, for all the wrong reasons.

Wheeler's next venture *Point of View* (*POV*) (2001) is one of few examples since, with a two-thirds reduction in budget from *TLC* to $250,000. A "contemporary, edgy urban story about obsession, art, eroticism and murder," it centers on Jane, a reclusive artist obsessing over her neighbor Frank, photographing him from her apartment window (Hitchcock's *Rear Window* remediated once more), and creating fantasy art of them together. As the back sleeve puts it, "Jane's unusual behaviour sets the stage for danger and bizarre events, both real and imagined." But interestingly, this time little sex, not because Wheeler had not intended it, but because, as he has since revealed with great annoyance, the "beautiful" actor playing Jane had agreed to bare her breasts during the casting but once on set resolutely refused to do so. Wheeler may know about Freud, but apparently not about karma.

Though *POV* lacks the blatant soft-porn sexual voyeurism of *TLC*, we are struck by the question of how much the interactive paradigm may increase the voyeuristic gaze in cinema, most famously discussed by Laura Mulvey in "Visual Pleasure and Narrative Cinema" (1975). We suspect it does significantly, and this was certainly the case in our first viewing experience of *TLC*. In relation to this, we are interested to turn Wheeler's own psychoanalytical model back on him in relation to how he guided audience expectations through the publicity launch announcement for *POV*. Although sexual content is not mentioned anywhere in the copy, our italics emphasize the sexual and dominatory instincts of the voyeuristic gaze that underlie its language and message:

Respond to the characters, *investigate* into *their private, intimate lives*. Get involved in their emotional and *moral choices*. *Delve* into your own psychology and *watch the story unfold, uniquely influenced by you*. *Be thrilled*, intrigued, scared, *provoked and stimulated* into a *deeper*, more entertaining movie-*watching experience*. Get involved. *Go deep*. After all, it's *your point of view*.

The Problems and Pragmatics of Interactive Cinema

For commercial companies, myriad pragmatic problems far more pressing than theories of voyeurism beset interactive cinema. These are particularly related to the traditional naturalistic narrative models of commercial cinema, which do not inhibit comparable art-based experiments in the same way. To give enough breadth to differentiate different plotlines and to follow the stories of different individual characters takes vast amounts of film, and consequently vast budgets, and the key problem is that most of it will not be seen. Daniel Sandin provides diagrams to illustrate the significant mathematical problems of multiplicatory branching-structure cinema narratives, concluding,

In order for participants to have five significant choice points within the *film*, each choice having two options, the producer needs to create 63 prerecorded segments. Ten choices would require 2,041 prerecorded segments. In this case, a single viewer would experience only ten segments, or one-half of 1 percent of the work created. There are, of course, inventive special-case solutions. Consider a story that has choices, but the plot line converges to the same point after each choice, independent of the choice. Then, five choices would require only 11 segments. One reasonable solution to handling the immense variety of experiences that interaction requires is realtime image generation, instead of prerecorded segments. One has to simulate the world and compute the effects of the participants' choices.[48]

A related production problem concerns the need for all the narrative strands to be equally strong whichever path a user follows. But it is difficult enough for scriptwriters to create just one successful plot structure—to invent fifty or a hundred, all interrelated and interweaving, may be asking too much. Although there are highly successful movies that are multilinear, such as *Short Cuts* (1993), *Magnolia* (1999), and *Timecode* (2000),

they are nonetheless linearly sequenced and finite in plot and length. They remain examples of the art of scriptwriting as (among other things) making the "right" choices: of rejecting numerous possible plot developments and branches to decide on the ideal ones. For this reason, a prevalent point of view is that people do not want to interact with the cinematic medium at all; they are uninterested in navigating through or creatively experimenting with a maze or road map, but prefer the best and most direct route to cinematic satisfaction—which is what the scriptwriter is paid for. As Max Whitby points out, the idea that screen audiences can construct their own narratives is initially appealing to studios and filmmakers, but "the trouble is it doesn't sustain. When you actually get in there and try to make things in an interactive way, the premise falls apart."[49] Allen Yamashita is equally cynical about the desirability and future of interactive screen narrative, arguing that cultural traditions from ancient storytelling to contemporary theater and cinema indicate audiences' preference to be passively manipulated through narratives rather than to be active manipulators of them.[50] In "The Myths of Interactive Cinema" (2002) Peter Lunenfeld goes further, to dub the entire genre "a failure."

A number of workshops and seminars on interactive cinema have wrestled with the problems of the form and with creative solutions. In two weeklong workshops run by SAGAS in Munich that we participated in during 1997 and 1998, the idea of a cluster database of video or film sequences was suggested as a preferable model to simple branching structures. The workshop leaders Jay Bolter and Michael Joyce suggested that cluster models could enable a type of interactivity that challenged the "stop-choose-start" sequentiality of branching narratives. When film clips are grouped into clusters related to criteria such as plot developments, characters, and themes, at each decision point more options are opened than with "A > B or C" branch structures, and moreover, unselected clips from each cluster can be accessed later where appropriate to the preceding sequence. This results in a less plot-driven and constructivist model of storytelling, and opens out more possibilities for diversified narrative and artistic conceptions. It seems likely that the future for interactive cinema, if there is one, will reside in these more holistic, less expensive type of formats than branching-structure models. At the same time, the increasing convergence of games and cinema as seen, for example, in the *X Files* (2000) movie-game (moving the interactive paradigm from navigational to participatory) is the route the genre is currently, and relatively speedily, heading for.

Concluding her book on interactive narratives, *Digital Fictions* (2000), Sarah Sloane revealingly adopts a downbeat and conservative tone, maintaining that the fuss and flurry which greets every new iteration of digital storytelling derives "simply from their novelty."[51] While acknowledging that new narrative conventions and genres will continue to be developed and refined, she concludes, "adding computers to the storytelling relationship will ultimately matter little in the long run. . . . A good story will always be a good story, regardless of its medium or mode of presentation."[52]

Although Paul Vanouse's *The Consensual Fantasy Engine* (1995, with Peter Weyhrauch) is an interactive movie whose only interactivity involves response to multiple-choice questions, its voting device and theatrical setting turns a navigational paradigm into an audience-participatory one. *The Consensual Fantasy Engine* is a computer program that constructs montages of film and video images in response to audience preferences, metering their applause volume levels to multiple-choice answers to the different questions posed onscreen every five minutes. The central theme is the police car chase of O. J. Simpson, which was televised on American (and global) TV, and this footage is intercut with short clips of other chases and action sequences from a range of movies, TV programs, and cartoons. Depending on audience preferences, each five-minute montage draws on different styles and genres (using film clips from the oeuvres) to present pastiches of film noir thrillers, Bonnie and Clyde-style adventures, or Keystone Kops–inspired comedies. In the performance we attended, comedy was the audience's main preference, and the helicopter and ground footage of Simpson's speeding car was interspersed with an increasingly manic montage of silent movie car stunts, the automobile crashes from the movie *The Blues Brothers* (1980), and classic cartoon chases including *Tom and Jerry* and *Roadrunner*.

Vanouse uses the Simpson chase to examine the distinct relationship and influence between broadcasting and society's belief systems, and to "explore how the media and public have a substantial stake in the creation of such metaphors and meanings."[53] Although the limitations of the audience democracy interactive paradigm have been widely raised, we would note that *The Consensual Fantasy Engine* performance we experienced was highly engaging, entertaining, and interactive. The necessity for audience members to make the loudest possible noise to ensure their choice led to considerable interaction within and among the audience and a genuine sense of communality emerged as the raucous crowd continued their shouts, conversations, and loud, comic asides even after the choices had been made. Interactivity by vote may be a blunt instrument, but in this case, although the audience-to-screen interactivity may have been relatively simplistic, more important, it empowered the audience to become highly active and interactive with one another.

Vanouse's later collaboration with Michael Mateas and Steffi Domike, *Terminal Time* (1999) is a "history engine" using a computer system that incorporates artificial intelligence capabilities. An interactive movie for cinema audiences, the opening credits announce (with a nod to Bill Seaman's concept of the "recombinant poetics" of digital arts[54]) "The Recombinant History Apparatus Presents: *Terminal Time*." The recombinant software then goes on to meter and respond to the sonic levels of applause in the theater as audiences respond to multiple-choice questions posed on screen, for example:

What is the most pressing issue facing the world today?

A: Men are becoming too feminine and women too masculine.
B: People are forgetting their cultural heritage.
C: Machines are becoming smarter than people.
D: It's becoming harder to earn a living and support a family.[55]

As its tongue-in-cheek publicity puts it, "the answers to these questions allows the computer program to create historical narratives that mirror and even exaggerate audience biases and desires. Just clap, watch and enjoy. At long last *Terminal Time* gives you the history you deserve!"[56] The computer assembles different montages of Pathé-esque pseudo-documentary film footage from its database in response to the audience's choices: first, a six-minute whistle-stop historical tour from 1000 to 1750, and following more multiple-choice questions, the periods from 1750 to 1950, and from 1950 to 2000 (figure 23.6). Historical events such as the causes of wars are reinvented or given new slants according to how the "audience-powered history engine" interprets the audience's desires. *Terminal Time* runs on a Macintosh G3 linked to an AV library on a 36-gigabyte external drive, and its artificial intelligence architecture draws on three elements: a "Cyc" knowledge base (a standard AI core); ideological goal tress (discerning appropriate responses in relation to audience desires); and story experts (providing narrative conventions and coherence).

As Jay Bolter and Diane Gromala note, this type of mass audience voting is undertaken at once frivolously and seriously, and serves to enable the computer system to assess and identify the audience's ideology and to trigger content choice and ordering in accordance.[57] They discuss the piece in relation to the way it seeks to demonstrate how history is constructed, constrained, or rewritten in relation to cultural context and ideology, and how its interactive model emphasizes and satirizes how audiences experience media products in accordance with their particular beliefs and prejudices.

Earlier cinematic examples of mobilizing whole audiences interactively include Loren Carpenter's "Cinematrix" technology, premiered at SIGGRAPH in 1991. This enables large audiences to exert control over screen events by each holding up a paddle "wand" (like a ping-pong bat) and turning either its green or red side to the screen, where a camera sends the information to a computer that interprets the data. At SIGGRAPH, audiences also used the wands to play a communal game of *Pong*,[58] with the right-side half of the audience controlling the right paddle onscreen and the left-side half controlling the left paddle. Turning the wand to red made the screen paddle rise up the screen, and green made it descend. Dan Sandin reports that "several energetic interactive sets were played,"[59] and Laurel, Strickland, and Tow describe how using the system "crowds have been observed to learn very quickly to cooperate well enough to play mass games of Pong, make intricate patterns, and even control a flight simulator."[60]

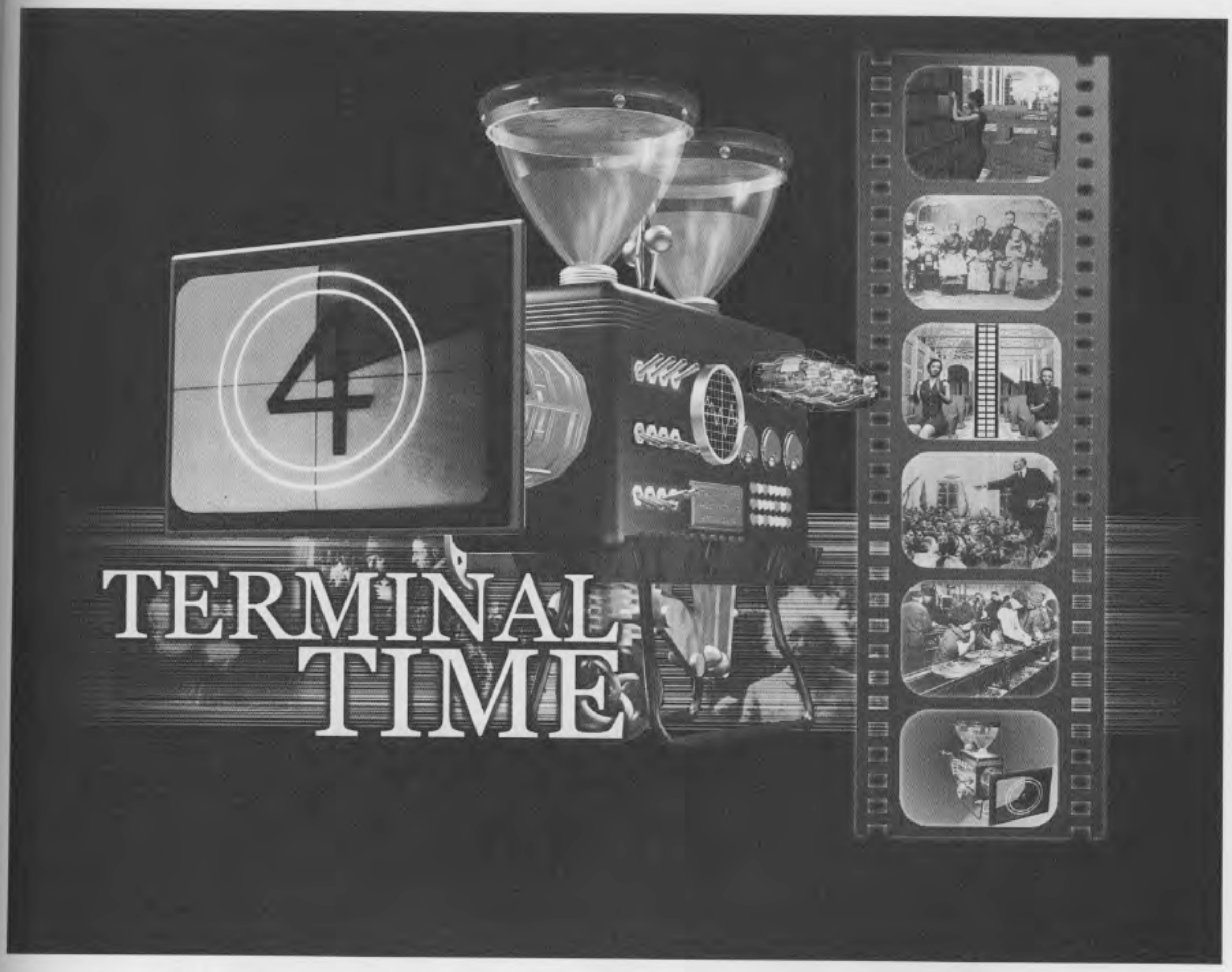

Figure 23.6 A screen image from *Terminal Time* (1999), an audience-responsive interactive cinema production by Steffi Domike, Michael Mateas, and Paul Vanouse.

Theater and Participation

Theatrical audience participation has a long history, and the frenzied clapping to bring Tinkerbell back to life in *Peter Pan* or the pantomime calls of "he's behind you!" and "oh yes you did!" offer an energetic sense of audience interactivity, though with little real impact on the narrative action, which is predetermined and always more or less the same. Audiences adopted participatory roles in Happenings in the 1960s, at the celebrated 1968 "Magic Theatre" performances at the Kansas City Museum, and ever since in numerous experimental performances, as well as large open-air community events staged by companies such as Welfare State International and I.O.U. Audiences input ideas for improvisational theater and standup comedy, become involved in murder mystery evenings, act

as guests at *Tony n' Tina's Wedding* (since 1988), and vote to decide "whodunit" at the end of San Francisco's long-running *Shear Madness* (since 1980).

A charming digital remediation of theatrical audience participation is presented in Bruno Cohen's interactive installation *Camera Virtuoso* (1996). It uses a miniature theater complete with stage lighting and dressing room in conjunction with infrared transmitters, movement sensors, video technology, three laserdisc players, and a CD-ROM. The solo user enters the miniature theater, moving from foyer to dressing room, from where a miniaturized theater stage is observed through a semitransparent mirror. Various prerecorded sequences are played out on the miniature stage, including a magician's act and a lighting rehearsal, and characters encourage the user's participation: a dancer invites you to copy dance steps and a violinist encourages you to sing. The spectator is able to respond and interact with these sequences, and is recorded by a video camera that transmits their image onto the stage, merging the user's actions and movements with the prerecorded characters. Hans-Peter Schwarz points out how *Camera Virtuoso* utilizes the conjunctions of computer and video technologies to expand traditional notions of theater, reexamining the accepted boundaries and roles of actors, technicians and audiences: "For Bruno Cohen . . . the design of dramatic form is not as important as the comparison of the classic set to the use of image technology in order to expand the stage. The variety of audience participation makes the plot possible."[61]

Chris Hardman's Antenna Theatre equips audience members with headphones through which instructions are relayed to them. In its "Walkmanology" interactive walk-through performances, such as *Pandemonium* (1997), audience members are not intimidated by the demands of audience participation, but are rather given "permission to play again like children. . . . We are not put on the spot; we are not asked to invent what we do; we are told what to do, so we simply perform the prescribed tasks. Interaction with other people is often built into these tasks and is acceptable because we are merely following directions."[62] Tod Machover's *Brain Opera* (1996), with a libretto by Marvin Minsky, features three performers who select and interpret precomposed and audience-created elements using specially designed "hyperinstruments." A "Sensor Chair," a "Gesture Wall," and a "Digital Baton" translate and modulate movements into sound in different ways, while multiple projections on a curved screen provide counterpoints to the music or comment upon the performers' actions. During the finale, the audience is invited to dance on the stage's "Sensor Carpet," which intensifies the opera's sonic climax.

Audience members for Golan Levin's *Telesymphony* (2001) preregistered their cell phone number and theater seat number. New ringtones were downloaded onto the phones by Levin and his nine collaborators, who used custom-software to dial the phones in different prearranged sequences during the performance to choreograph and create a complex symphony, with as many as two hundred phones ringing simultaneously. As each audience member's phone rang, individual lights above each seat came on, and their physical presence as part of the performance was highlighted (not simply the sounds of the phones

with them); "the resulting grid of lights illuminating the audience . . . [was] visible as a 'score' on projection screens at the side of the stage."[63]

In installations where visitors' walking or movement triggers sensors to activate planned events and programmed sequences and effects, it is arguable whether the primary interactive paradigm is, according to our continuum, navigation (the course the user takes), participation (users helping to bring to life the environment's sensory features), conversation (a dialogue between the user and the computer) or collaboration (the user and computer creating art together). For example, Keith Armstrong's performance installation *transit_lounge 2 (The Further Adventures of Ling Change)* (2000) hovers between navigation and participation paradigms. The movements of gallery visitors, as well as changes in light and atmosphere, affect the narrative journey of Ling Change as she travels through strange, comical, and beautifully designed computer-generated landscapes and meets cartoonlike characters (figure 23.7). In Paul DeMarinis's *Rain Dance/Musica Aquatica* (1998), installation visitors both navigate and participate as they pass under twenty streams of falling water, their umbrellas activating and modulating music and sound effects. Such sensory interactive environments hark back to earlier analog models, such as Nam June Paik's *Symphony for 20 Rooms* (1961), which called on the audience to play different audiotapes and kick objects around the room as part of the musical score. In the 1970s, pioneers such as Myron Krueger developed innovative interactive spaces such as *Metaplay* (1970) where visitors interacted with a screen which combined live video projection and

Figure 23.7 Keith Armstrong and Transmute Collective's interactive installation *transit_lounge Version 2* (2000).

computer graphics. For *Psychic Space* (1971), a sensory floor tracked visitors' movements through a graphic maze; and in *Videoplace* (1974), visitors' interactions manipulated the movement of images on a large projection screen.

Though in one sense motion-sensing installations can be argued to operate in all four of our interactive categories (navigation, participation, conversation, collaboration), our classifications emphasize which paradigm is most dominant and significant; and differentiate relative levels in the openness of interaction, what Rokeby calls "the degree that it reflects the consequences of our actions or decisions back to us."[64] In these terms, we categorize the majority of sensory installation environments as participatory, and early works typifying the genre such as Perry Hoberman's *Faraday's Garden* (1990) provides a clear example. Visitors to the installation walk along a mat containing footpad sensors which activate old record players, film projectors, radios, and power drills that Hoberman collected from flea markets and garage sales. He suggests that since the objects "span the entire twentieth century, movement around the room also functions as a kind of time travel."[65] In such installations, the sense of conversation or collaboration is far less marked than a more general sense of participation in bringing Hoberman's space "to life." Here, the sense of direct agency is limited and interactivity operates more on the level of cooperation than conversation—it could even be argued that it is merely navigation, since moving to a certain place to activate a specific effect differs little from clicking a mouse to achieve it.

Conversation

But in Hoberman's *Lightpools* (or *El Ball del Fanalet*, 1998) our third category of interactivity is reached since a meaningful "conversation" takes place, a dialogue that is reciprocated and is subject to real interchange and exchange. Users carry a physical lantern equipped with a position sensor (called a "fanalet") around a dimly lit circus ring–like space where glowing light shapes are projected onto the floor. A computer tracks each lantern's position in three-dimensional space and generates and transforms the projected light polygons, "proto-objects" ranging "from mechanical to biomorphic, abstract to ornamented."[66] By placing the lantern above one of these light-forms and moving it up and down, users can "feed" them, making them metamorphose, grow, and even dance. Participants can also move toward each other with their lanterns to bring the light shapes they have captured into contact with another user's entity. The shimmering forms then merge and "breed," whereupon they metamorphose into a new, single organic form or explode in a visual starburst, showering out a new crop of *Lightpools* around the floor for the cycle to begin again.

Nurturing and breeding these vivid, beautiful forms with other participants in the atmospherically lit, sonically reverberating circular space we found to be an intensely pleasurable, even joyous experience. The sense of *Lightpool*'s interactive paradigm being one of conversation is twofold: through its sophisticated level of user control over the move-

ment and metamorphoses of these highly responsive proto-objects (a "conversation" between user and software); and in the interactions between users themselves, who come together and "converse" with and through their lanterns and the captured light forms.

In works that operate on a "conversational" interactive paradigm, there is often a complex relationship or negotiation established between the user/audience and the work, which is reliant on such issues as trust, cooperation, and openness. Such notions have been central to live interactive theater and performance since the 1960s, and an interesting example is provided by Valie Export's famous live street theater performance *Tapp und Tast Kino* (*Touch Cinema*, 1968). It intimately explored the ethics of live interaction, with Export inviting passers-by to feel inside a cardboard box she had constructed around her torso. Export calmly and unthreateningly held the gaze of each spectator as they placed their hands inside the box and touched her naked breasts. The piece played with a delicate ethics of intimacy and interaction, balancing notions of trust and abuse. In Export's feminist critique of woman as sex object, a fascinating, reversed interactive relationship between looking and touching was also set up. Export's breasts, as objects of desire to the male gaze on public streets were now hidden from view, but the male fantasy to fondle them was enabled. But in fulfilling the fantasy, the gaze of the male user was challenged and undermined, being directed onto the impassive, controlled stare of the woman he was invited to touch, whose female gaze now became the dominant and judgmental one.

The scenario is remediated for the high-tech age in the Centre for Metahuman Exploration's *Project Paradise* (1998), where a user in one booth can control the arms of a live male, naked actor to caress the breasts (or any other part of the anatomy) of a live, naked female actor. A user in a second booth controls the arms and caresses of the female actor, so the touching is mutual. The "Cyborg Adam and Cyborg Eve" wear nothing apart from engineered, jointed metal arm braces that are telerobotically controlled by the two gallery visitors in their separate booths using a touch-phone keypad (the parallels with phone sex are clear) (figure 23.8). When visitors enter one of the two booths (the allusion to peepshows is equally clear) they see a video monitor showing the point of view of either Adam or Eve, who stand opposite one another. The two visitors in their booths, like two puppeteers, then use the keys on the phone pad to enact an (invariably erotic) encounter between each other at a distance, through the live, corporeal agency of the two live "avatar" performers who are hidden from direct view but shown on the monitors. The booths are unmarked, and only once inside does the user discover whether their gender is the same or different from the performer they control.

The heterosexual pairing of Adam and Eve in *Project Paradise* seems to reinforce an ideology of compulsive heterosexuality. The multilayered questions of identity that the piece raises, however, constitute a radical challenge to the very notion of a fixed sexual identity. When a lesbian participant caresses Eve using Adam's hands, is the encounter a "lesbian" or a "straight" one? . . .

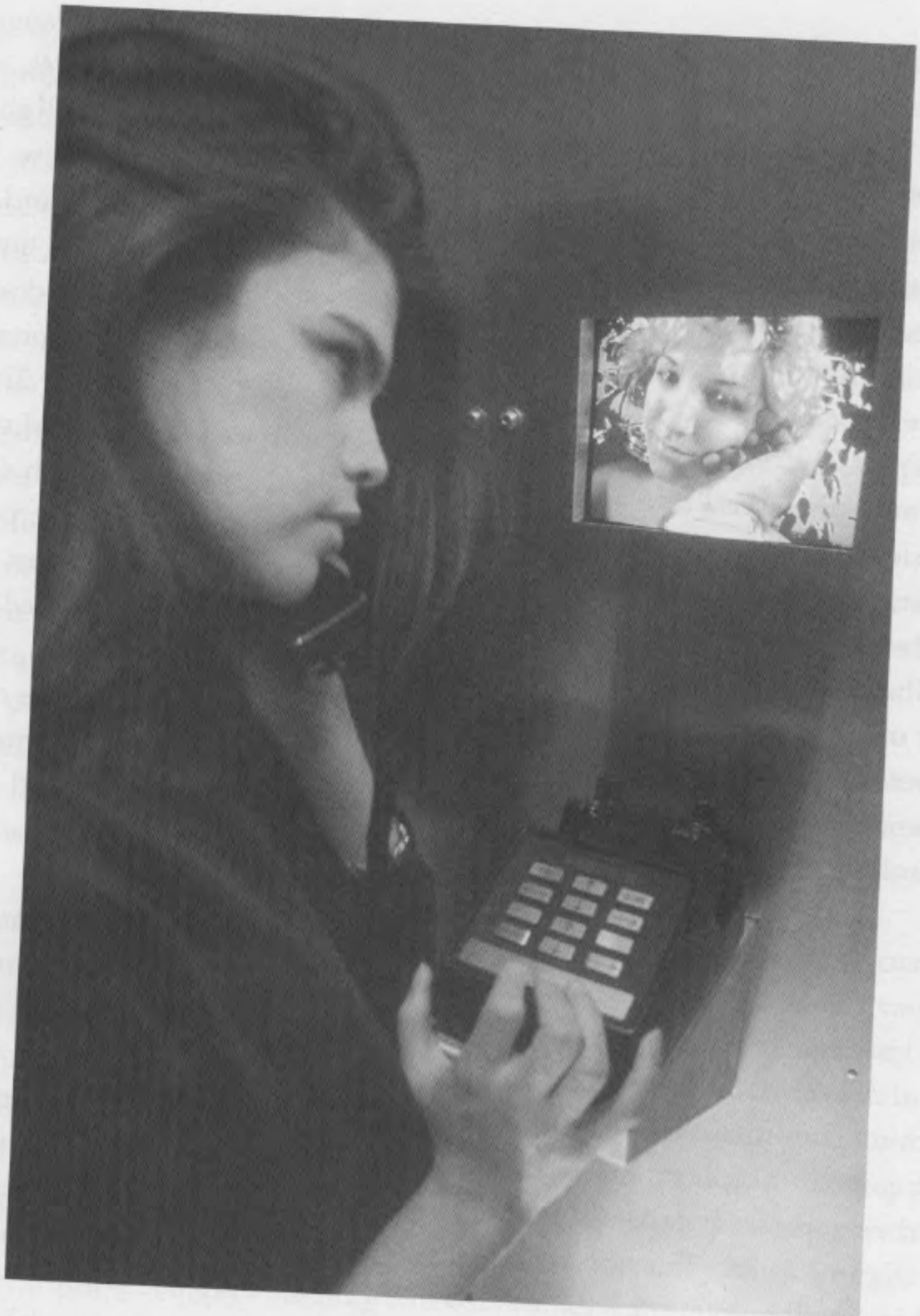

Figure 23.8 A user operates a telephone keypad to telerobotically caress the face of "Eve" in the Centre for Metahuman Exploration's *Project Paradise* (1998). Photo: Rob Long.

The eroticism of the encounter highlights the ontological doubleness of any live theatrical event, where by definition real events represent fictional ones. . . . At what point can anyone, including the actors themselves, determine when a pretend caress becomes a real one?[67] (figure 23.9).

The subjective camera viewpoint enhances the sense of the user's identification with one of the performers, and the artists compare the effect to the user being "projected" into a "remote paradise" where they "inhabit" the bodies of the remote performers to engage

Figure 23.9 When does a pretend caress become a real one? The Adam and Eve actors become erotic avatar puppets controlled by users in *Project Paradise* (1998). Photo: Rob Long.

in physical interaction.[68] As David Saltz puts it "the camera strongly implicates me as the subject of my character's actions," while the telerobotic technology "is a conduit that links the participant's subjectivity to the actor's."[69] Saltz's analysis of *Project Paradise* highlights its techno-fetishism and the blurring of lines between fiction and reality. He goes on to present an interesting and persuasive argument in relation to interactive telerobotic art, suggesting that the distinctions between the multiple subjects collapse to produce "a single virtual subject" or a "collaborative subject" that "relies on the contributions of multiple subjects to synthesise a single virtual subject." He also notes the parallels between these forms of interactive works and theatrical performance, where similar collaborative agencies exist between writer, director, designers, and actors. We would add how computers and the Web, both their use and their influence, have vastly extended the collaborative paradigm within society from business to the arts, from social activism to "vote-for-who/what-you-want" reality television.

Paul Sermon's interactive art similarly works as a conversation between two or more visitors separated in real space but telematically brought together to interact on a bed (*Telematic Dreaming*, 1992), on a sofa (*Telematic Vision*, 1993), or in a shower (*A Body of*

Figure 23.10 Remote participants are telematically brought together to interact in Paul Sermon's *Telematic Vision* (1993).

Water, 1999, with Andrea Zapp) (figure 23.10). Sermon's *Peace Talks* (2004) presents an "absurdist" piece of virtual theater where users participate in a simulated peace talks conference. Two identical, yet remote rooms are linked using broadband videoconferencing, and as in *Telematic Dreaming*, the users are "transported" via a monitor into a third telematic space, this time consisting of a room with a table. The two users thereby meet in the third (virtual) "peace talks" room containing a round table set out with UN-style national insignia, papers and microphones. As the remote participants virtually shake hands and improvise a peace talk dialogue together, each user's sense of physical presence is restricted due to the video glasses they wear, and Sermon also uses an optical illusion to make them appear to change scale on the monitor as they move around. Their visual awareness and ability to navigate the room is reliant on the view of the camera, and Sermon explains: "*Peace Talks* serves to ridicule the absurdity of a peace talk charade, whilst simultaneously offering a tongue in cheek, yet very viewable, alternative."[70]

Luc Courchesne's work uses aspects of navigational interactivity, for example, menu options and multiple-choice questions, and combines them with highly conversational modes. In his early interactive videodisc installation *Portrait One* (1990),[71] the user holds a conversation (in one of six languages) with Marie, who appears in close up on screen. A touchpad is used to select textual menu options of possible things to say and, depending on a range of factors (including the user's tact and Marie's mood) she may be frosty and uncooperative, replying with lines such as "Are you staring at me?" or

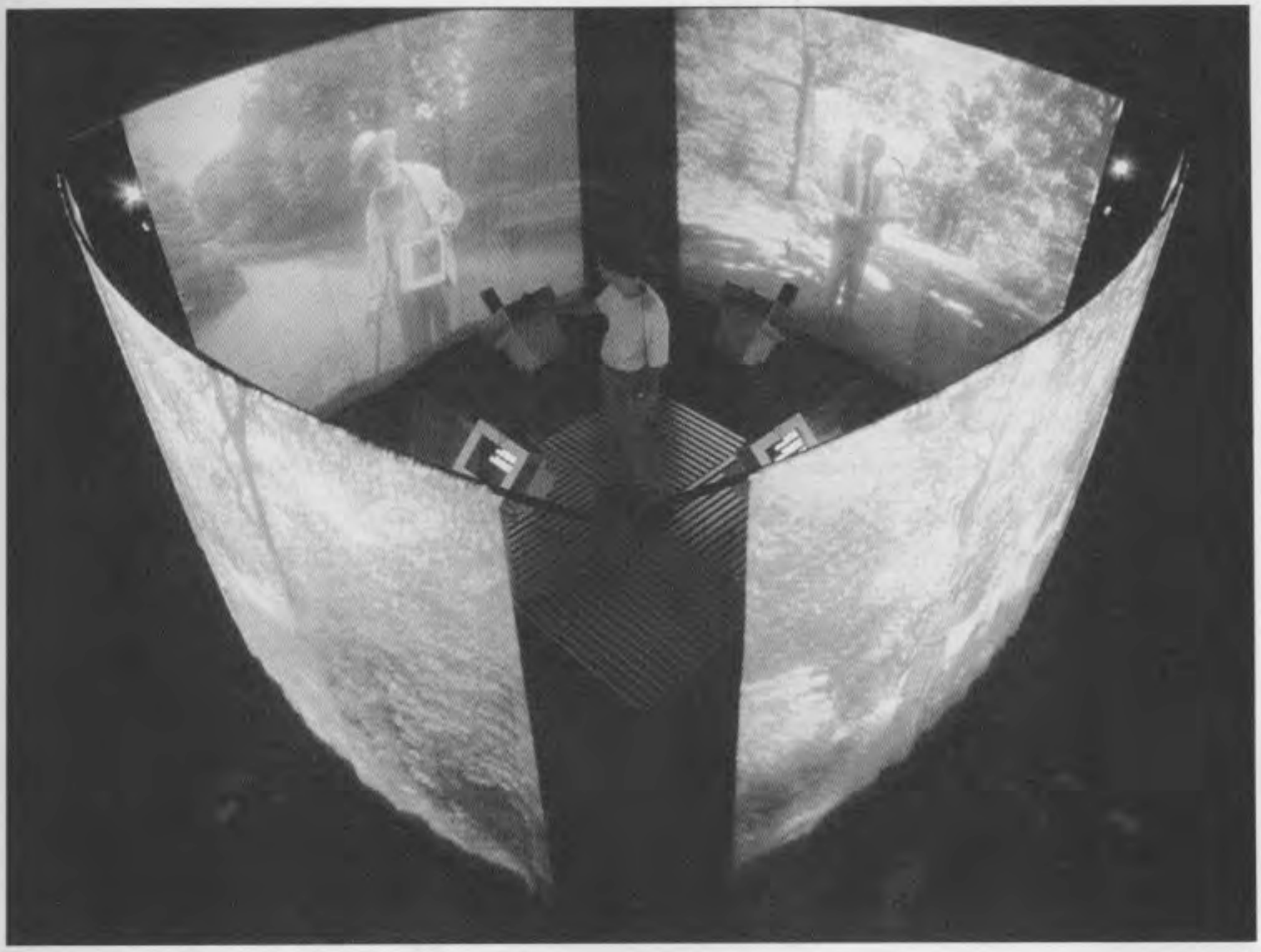

Figure 23.11 Luc Courchesne's beautiful and highly immersive interactive installation *Landscape One* (1997).

may engage in deep and intimate conversations, including ones about the nature of love in a virtual context. His rich, panoramic four-screen space *Landscape One* (1997) creates a 360-degree public garden, where visitors use voice or touch to select questions and lines of dialogue from imposed sets to communicate with onscreen characters (figure 23.11). The same model is used in *Hall of Shadows* (1996), where the virtual characters (laserdisc video recordings of the actors) are projected onto large reflective panes of glass on the ceiling "making the four characters appear as ghosts within the space shared with visitors."[72]

A conversation with both software and text takes place in Camille Utterback and Romy Archituv's corridor-like installation *Text Rain* (1999), where colored letters fall like drops of rain from the top of a screen that also relays and projects a live black-and-white video image of the visitor. As the falling letter particles come in contact with the outline of the user's body on the video image, they collect on its surface, sometimes creating random word formations, other times forming discernible words and phrases from the poem text

the letters come from, Evan Zimroth's *Talk You* (1993). As Bolter and Gromala note, it becomes a kinetic and interactive poem as the letters form and transform like abstracted, Joycean phrases; and the visitor engages in a playful relationship with the technology, at times asserting control, at others unable to collect or hold the descending letters. Pairs of visitors can also hold boards and sheets between them to catch the letters and, by flicking the material upwards, to send them rebounding and scattering into the air. Bolter and Gromala explain how *Text Rain* appeals and is accessible to a broad audience: "not an elite piece of art, but an experience to be appreciated by both construction workers and Ph.D.s in computer science"[73] (figure 23.12).

In *Windows and Mirrors* (2003), Bolter and Gromala analyze installations at the SIGGRAPH 2000 exhibition and argue that many operate as mirrors (as well as windows), either literally offering a mirrorlike reflection through the use of a live camera feed, or in a metaphoric sense, reflecting contemporary society back on itself through layers of cultural and media imagery. Their lengthy analysis of *Text Rain* is used as a centerpiece in their argument that digital design should not attempt to become invisible (in contrast,

Figure 23.12 And a vowel please, Carol. Custom built software controls the falling and bouncing letters in Camille Utterback and Romy Archituv's delightful installation *Text Rain* (1999).

for example, to Donald Norman's argument in *The Invisible Computer* (1998)). They maintain that the goal of pragmatic and "structuralist" computer scientists such as Norman and Jakob Nielsen to make the computer interface transparent is too singular; rather, the aim should be a rhythmic oscillation between the transparent and the reflective. Digital art, they claim, "reminds us that every interface is a mirror as well as a window,"[74] and *TEXT RAIN* is a definitive case in point:

> *TEXT RAIN* is both visible and invisible as a media form. The participants find the interface so easy to use, so natural, that they need no instruction at all. They understand instantly how to project their images on the screen and interact with the falling letters. The space of *TEXT RAIN* is an image of the physical world and at the same time an interface, a space for the manipulation of texts.
>
> Digital art, like other digital applications, often opens a window for us, as we look through the computer screen to see the images or information located "on the other side." But *TEXT RAIN* is also a mirror, reflecting us as we manipulate the letters . . . [and] simultaneously surprises and pleases us by being simultaneously a mirror and a window.[75]

Toni Dove's *Artificial Changelings*

A highly dynamic conversation takes place between the user and Toni Dove's extraordinary interactive movie *Artificial Changelings* (1998), providing one of the most compelling experiences we have encountered on the path to this volume. The key to this magic is not so much the movie itself (excellent though it is) but its interactive structure and freedom, and the opportunity for the user to minutely control it using David Rokeby's *Very Nervous System* software. Users book in for a half-hour individual session in the installation, and use their body movement to interact with and control the movie images and sound of "a romance thriller about shopping" which opens in Paris at the end of the 19th century "and travels to an unnamed future"[76] (figure 23.13).

The installation is an immersive environment with a large curved rear projection screen, and the participant steps into a pool of light in front of the screen and can then move into one of four interactive zones marked out on the floor. Changing your proximity to the screen alters your viewpoint and situation, the sound, and the images on screen—for example, moving closer to the screen results in closer camera angles on the characters or images observed, and the sounds becoming quieter. Once you draw very close to the screen, extreme close-ups and intimate voiceovers suggest that you are "inside" one of the principal character's heads—Arathusa, "a 19th century kleptomaniac with self-destructive tendencies [who] suffers from constraints of Victorian society [and] gets an erotic thrill from stealing" (figure 23.14); and Zileth, "a woman from the future, both real and imagined, [an] encryption hacker searching for enemies, a dreamer and a voyeur obsessed with power"[77] (figure 23.15). Moving into the marked time tunnel floor zone enables the user to traverse the centuries of the narrative, some of which plays as conventional linear movie sequences.

Figure 23.13 An individual user has 30 minutes to navigate through and control Toni Dove's extraordinary interactive "movie" *Artificial Changelings* (1998).

The soundtrack and the behavior of the images react precisely and fluidly to body movements, the whole piece changing speed, color, atmosphere, and feeling as the user crosses the floor zones or makes gestures with her limbs and body. In periods of "dream suspension," body movement such as twists or arm circles give the user absolute control of the visual media, able to play the screen characters' movements forward or in reverse, in direct relation to the speed and nature of the user's movement. As Dove puts it, "the video motion sensing system allows the viewer a theremin-like control over sound and image. . . . Like a video android with a dual personality, the narrative accretes from a kind of "swimming" through the information in the environment[78] (figure 23.16).

One thus literally dances with onscreen characters, and we spent a number of sessions in the installation "scratch-choreographing" the movements of a character in a diaphanous white dress (recalling the figure of Loïe Fuller) running and dancing in a moonlit garden. At the same time that the user's body or arms scratch and play the video images, they also play the music and sonorous soundscapes (which was the original purpose of the *VNS*

Figure 23.14 Arathusa, the "nineteenth-century kleptomaniac with self-destructive tendencies," in *Artificial Changelings.*

Figure 23.15 Zileth, Arathusa's alter-ego, "a woman from the future, both real and imagined," in *Artificial Changelings.*

Figure 23.16 "The video motion sensing system allows the viewer a theremin-like control over sound and image." An image is duplicated numerous times through the user's movements in *Artificial Changelings.*

software before Rokeby also brought visual media under its control). The user's arms and body conduct Peter Scherer's extraordinary audio database so that dense musical chords and sounds ascend or descend or create symphonic effects, while delicate finger movements prompt high melodic scales. The preciseness of the user's control over sound and image feels distinctly cybernetic and genuinely futuristic, and as Dove rightly maintains:

> [Your] body is stuck to the movie, a part of it, lost in space and time. This effects [*sic*] the way a viewer moves, and perhaps how we might think about what a body is—its boundaries and edges go soft. . . . This combination of action and physical sensation induces a trance-like state physically connected to the media that contributes to spatialising the narrative experience and disrupting a linear or sequence based notion of plot.[79]

Collaboration

During Nam June Paik's *Exposition of Music—Electronic Television* in 1963, Joseph Beuys made an impromptu participatory impact by attacking a piano with an ax. Though the gesture was wholly in keeping with the "happening" spirit of Paik's exhibition, it transformed what had been up to that point been a participatory interactive space into a collaborative one (even leapfrogging over the interactive category of conversation). Beuys did

not just join in (participation), or undertake a dialogue with the artwork (conversation); he did something to alter significantly the artwork/interactive performance space itself (collaboration). Interactive collaboration comes about when the interactor becomes a major author or coauthor of the artwork, experience, performance or narrative. The collaboration may be between a single user and the computer/virtual environment, but more usually occurs when users work together with others to create new work by means of computer technologies or within a virtual environment.

Numerous interactive collaborations have been discussed already in other chapters, and the collaborative spirit in art and performance, particularly on or via the Web in the form of group dramas as well as major projects such as *Oeudis* (1997), is one of digital performance's most pronounced and characteristic features. A sense of creative collaboration is clear from the very title of Company in Space's Web project *home, not alone* (2000), as well as its publicity, which invites us to

> ENTER> . . . sit back in the comfort of your own home creating complex movies laden in personalised statements via orchestrated online participation. Watch performers on screen, change the scene, adjust lights and soundtrack, or send a personal message to the actor. Re-create the site at will, but remember . . . you are not alone.
> EXIT> and the site remains in continuous dialog with its global audience ensuring the work's history is constantly recreated in real-time, never fixed, permanently integrated.
> BEYOND THE WEB> Uniquely, Company in Space reconstitute the site by layering projections of the public's visual, aural and intellectual authorship on urban architectural structures: a new graffiti.[80]

Webbed Feats' *Bytes of Bryant Park* (1997) elicited input from online contributors prior to the event that directly affected the content of performances taking place on six stages around New York's Bryant Park. People accessing the group's website contributed musical, theatrical, creative writing, and choreographic ideas for a partly rehearsed, partly improvised six-hour festival of theater, dance, poetry, and music seen by a park audience of five-thousand, and simultaneously webcast. Performers used and interpreted the myriad stimuli submitted to the site, which included sound effects, soundtrack compositions and rhythm scores, poetry, dance phrases, written and spoken dialogue segments, and set and costume designs. On the Mezzanine stage, four actors and dancers improvised in response to the Web contributions; the Goethe Stage presented a rehearsed interpretation of *Faust* influenced by the Web ideas; and original poetry and creative writing contributions were performed on the Gertrude Stein Stage. On the Promenades beside the park's great lawn, extended dance sequences were created by stitching together submitted choreographic phrases, and by the dancer's free interpretations of descriptive words submitted to the site. On the Dodge Stage, in front of a statue of New Yorker William Earl Dodge, a series of one-minute performances was played, submitted in the form of "soap box editorials."[81]

La Fura Dels Baus' millennium night *Big Opera Mundi* (2000) was an "global live opera" created online by remote artists, musicians, and other participants who sent their inputs progressively in the minute zero of the new year, as it consecutively happened in different world meridians. The company call it a "telepathic event . . . [to] creatively channel the euphoria generated by large events . . . an idea, a hope, a dream, and a utopia for the new millennium."[82] Sita Popat has developed major pan-European dance collaborations for students, who devise separate pieces of choreography and upload them on the Web for discussion and development between the different groups, before they all come together from their various countries to perform the entire piece in real space. For Popat and Satorimedia's *In Your Dreams: Hands-On Dance Project* (2000) three stages of Web-based activity and collaboration formulated the final dance performance. In stage one, remote participants sent in ideas and images around the theme of dreams, and videos of short dance phrases they inspired were uploaded onto the website. In stage two, participants collaborated in videoconferenced rehearsals, watching the Satorimedia performers and offering comments and suggestions; and in stage three participants chose the order of the series of different dance phrases for the final performance.

Douglas Davis's ongoing interactive scriptwriting project *Terrible Beauty* (1997, with Christine Walker) offers its online participants "many roles, as Voyeur, Playwright, as Reader/Critic, as Actor (yes, you can read lines in company with a global cast of volunteers, whom you can already see, hear, and scent.)"[83] The evolving scripts center on the dynamic and changing revelations of the identities of two main characters. Originally called "I.D.", Davis subsequently changed the project's title to reflect his "awe" at "the aesthetic terror slowly emerging and building," renaming it *Terrible Beauty* from a line of a William Butler Yeats poem: "All changed, changed utterly. A terrible beauty is born."[84]

Projects and installations where visitors input material that is then directly stored and incorporated in the artwork can also be regarded as collaborative interaction, although the degree of artistic impact on the piece overall clearly varies from work to work. We would call Stephen Wilson's *Ontario* (1990) a collaborative installation since the visitor input is its primary (rather than secondary or incidental) material. A sound installation in a Netherlands church square, it involves passers-by answering questions about their views on religion, which are recorded, digitized, and stored, and then played back through individual speakers arranged around the square (figure 23.17). The conceptual and emotional content of the opinions are mapped against different criteria that determine the spatial placements of the sound outputs so that, for example, religiously conservative opinions come from one side of the square while liberal or atheistic responses come from another. Other sound elements are added, for example, answers to the question "Why is there evil in the world?" emanating from one speaker are accompanied by the sound of animal yelps from speakers near to it. In Wilson's installation *Father Why?* (1989), different emotions (sadness, anger, longing, forgetfulness) are explored in different areas of a space as a computer senses a visitor's presence and generates music and digitized speech in response.

Figure 23.17 Interactivity as collaboration: in *Ontario* (1990), passersby collaborate with Stephen Wilson's church square audio installation to provide its core content.

Visitors speak a short word or phrase related to each emotion into a microphone, and the phrases are incorporated into the computer's database repertoire. Lingering in one area, such as the "Place of Anger," prompts the computer to explore the emotion with increasing depth and nuance (figure 23.18).

For visitors of both of Wilson installations, those who speak into the microphones and record their inputs are interacting conversationally in the first instance, and collaboratively if (and only if) their words are incorporated and used later as output. However, for those who don't record their voices and prefer to move around and simply listen to the voices of others, the installations are not strictly interactive at all; they are conventional sound installations.

Conclusion: Play

The categories of interaction that we have defined—navigation, participation, conversation and collaboration—are helpful in delineating different forms of interactive art in relation to ascending levels and depths of interactivity, and their openness in accommodating and incorporating the user's own creative inputs. In drawing up this hierarchy, however, we are conscious that it could be argued that one essential element and category is missing—*play*. But rather than being a category unto itself, play pervades and unites all four interactive paradigms we have identified. A sense of play is equally fundamental to the *navigation* of a CD-ROM or interactive movie, *participation* in sensor-active

Figure 23.18 Stephen Wilson's installation *Father Why?* (1989).

environments, "*conversations*" with interactive screen figures, and creative *collaborations* with networked artists or artworks that embrace, remediate, and incorporate user inputs.

Interactive works encourage a playful, childlike fascination for the pleasure of cause and effect, where a simple hand movement or facial grimace causes a domino effect, a ripple through time and space that directly affects and transforms something outside of oneself. Interactivity in digital arts and performance is at its best a marvel of discovery, rekindling childhood feelings of intimate connection to a vast, inexplicable, and beautiful world. As Bolter and Gromala observe, "They ask us to react playfully and to wonder whether it is appropriate to play in an art gallery" as we "see ourselves as participants in the dance of our culture."[85]

We will now move on to the interactive model most obviously associated with ideas of play, and indeed of children—computer and video games. This model, too, is a veritable "dance of our culture," and one that should not be underestimated in its relationship not only to culture, but also to the future of digital art and performance. To date, many of the characters and choreographies in these video games have not been "pretty," but millions of user-practitioners seem as dedicated as Balinese dancers and (where it matters) as physically nimble as prima ballerinas, as they train hour after long hour, fingers callused and bleeding, perfecting this particular art of digit-al dancing.