

OpenEnded Group

artists' statement
selected artworks 1998–2011

OpenEnded Group



l-r: Kaiser, Downie, Eshkar

The OpenEnded Group consists of three digital artists — Marc Downie, Shelley Eshkar, and Paul Kaiser — who create works for stage, screen, gallery, print, and public space.

Exhibit and performance venues have included Lincoln Center, Barbican Centre, the Sundance Film Festival, the Hayward Gallery, the Whitney Museum, ZKM, SIGGRAPH, Ars Electronica, the Center for Contemporary Art (Glasgow), Massachusetts Museum of Contemporary Art (MASS MOCA), SITE Santa Fe, the ICA (London), the Wexner Center for the Arts, the MIT Media Lab, the Brooklyn Academy of Music, the Museum of the Moving Image, the Kitchen, the New York Film Festival, the Berlin Film Festival, the Fundació Antonio Tàpies (Barcelona), the Yerba Buena Center for the Arts (San Francisco), the York Minster, the Nabi Museum (Seoul), the ICC (Tokyo), the Monaco Dance Festival, Théâtre de la Ville (Paris), the Grand Theater (Hong Kong), the Chicago Museum of Contemporary Art, the Jerwood Space (London), and many others.

They have had artists' residencies at MASS MOCA, Bell Labs, UC-Irvine, Arizona State University, Harvard University, Empac, Cooper Union, Le Fresnoy: Studio national des arts contemporains, the Exploratorium, and Georgia Tech.

Reviews have appeared in *The New York Times*, the *New Yorker*, *Wired*, *Aperture*, the *Village Voice*, the *Guardian*, the *London Times*, *Newsweek*, *Time*, *Computer Graphics World*, the *Wall Street Journal*, the *Financial Times*, *Print*, *Le Monde*, *Die Welt*, *National Public Radio*, ABC TV, and elsewhere.

Among the prizes they have won individually or collectively are a Guggenheim Fellowship, the John Cage Award from the Foundation for Contemporary Arts, a Media Arts Fellowship from the Rockefeller Foundation, a Bessie award, an Arts in Multimedia Award from the Brooklyn Academy of Music and Lucent, and an Award of Distinction from Ars Electronica.

Their software research has received support from the National Endowment for the Humanities, the National Science Foundation, and the Mellon Foundation.

See www.openendedgroup.com. Or contact Paul Kaiser: paul@openendedgroup.com; mobile: 646 641-7841.

ARTISTS' STATEMENT

Much of our imagery reflects what one apprehends with the mind's eye. While our imagery is nearly always representational, it is also somewhat abstracted, as if it has been thought through — pondered or conjectured, rather than simply seen.

Though our medium is digital art, our works all bear the unmistakable trace of human presence. This is most clearly seen in the many pieces of ours that evoke human movement directly, whether of dancers on a stage, of children in a playground, or of pedestrians in a city. But the human trace is equally present in the very lines of our renderings, for which we have created a signature "hand-drawn spaces" style. With this, we can conjure up a three-dimensional world in the manner of gesture drawing rather than of the photorealistic lens, thus conveying senses of touch and intuition while tracing the movements of eye, hand, and mind.

We write our own code so as to have complete creative control of our art-making. For the past eight years, most of our time-based works are computed live in Field, our software platform, so that so that many of our works continually shift — never quite repeating, they keep surprising even the viewer who has encountered them before.

This real-time capability also allows us to create interactive works that respond to their environments. This response is not merely a matter of automatic triggering and mirroring as in so much interactive design, for artificial intelligence methods allow us to endow the imagery of certain works with intentions and predilections of their own as they respond to the world. The idea is that the artwork makes sense of shifting situations by picturing them to itself, the visual work being the trace of that process.

Recently, we have delved deeply into stereoscopic 3D projection, over which our custom real-time renderer and unusual capture techniques give us an unmatched degree of control. In 3D space, we find, the eye seems almost to touch what it sees, and the mind finds itself in a realm that is curiously familiar, for it matches that of our introspection and of our dreaming.

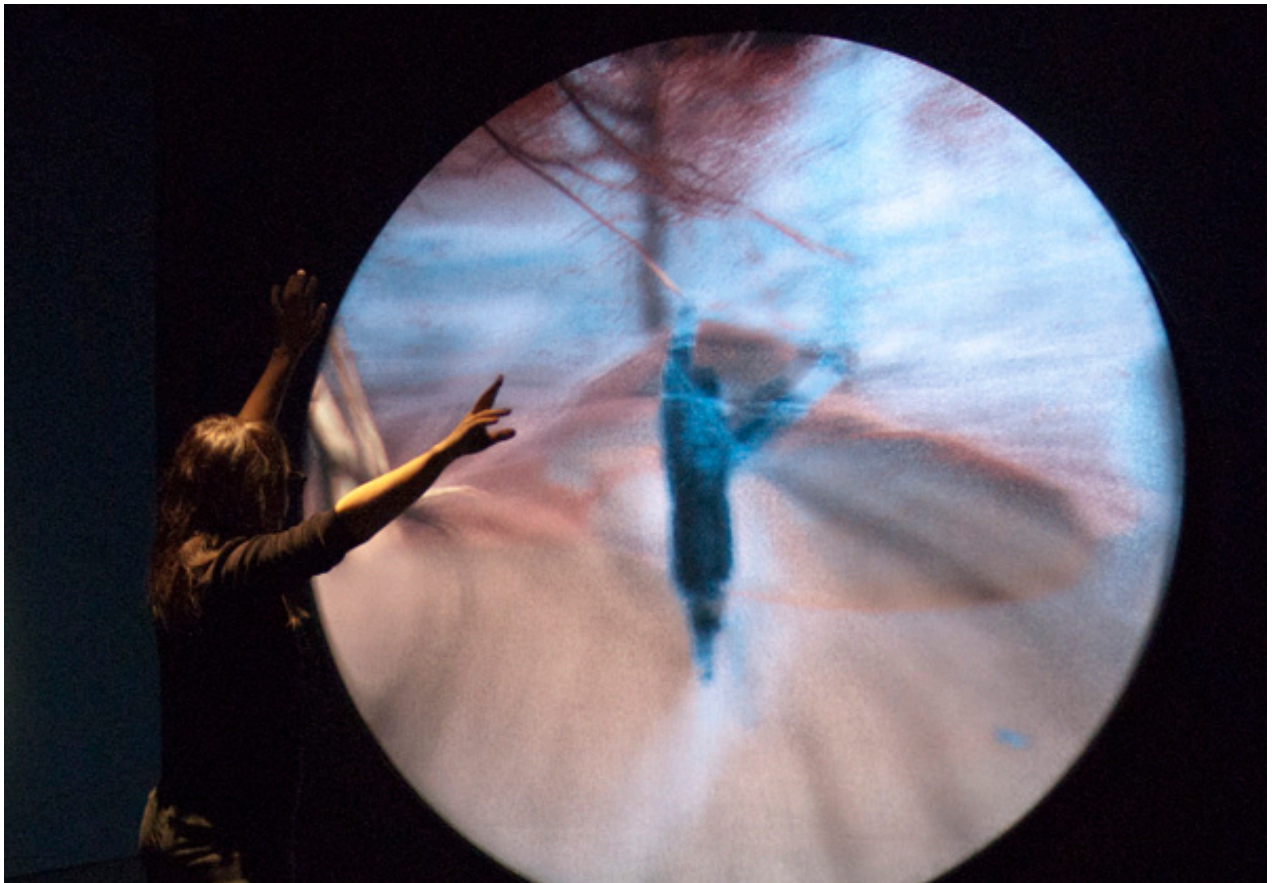
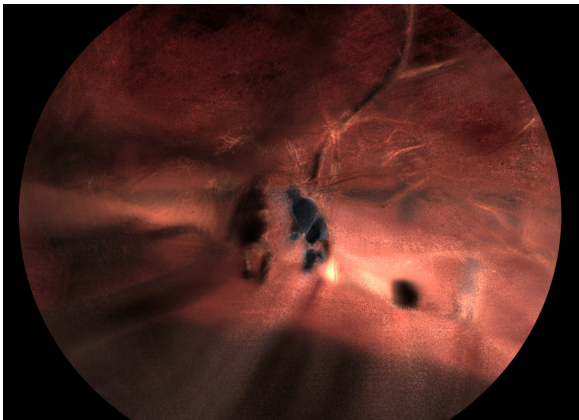
— Into the Forest —

Into the Forest (2011) is an interactive 3D installation that evokes the play and the daydreams of children exploring an ever-changing forest.

Into the Forest's painterly imagery seems to hover off the screen in stereoscopic 3D so that the viewer feels almost inside the imaginary virtual world. Indeed, from time to time, a spotlight comes on in the gallery, and anyone stepping inside it becomes a figure placed in that 3D world and intermingling with the virtual children there. The experience is akin to plunging back into the daydreams of childhood, which can be glimpsed again but never quite recaptured.

A haunting, ever-changing score was composed and performed by Tom Chiu (violin).

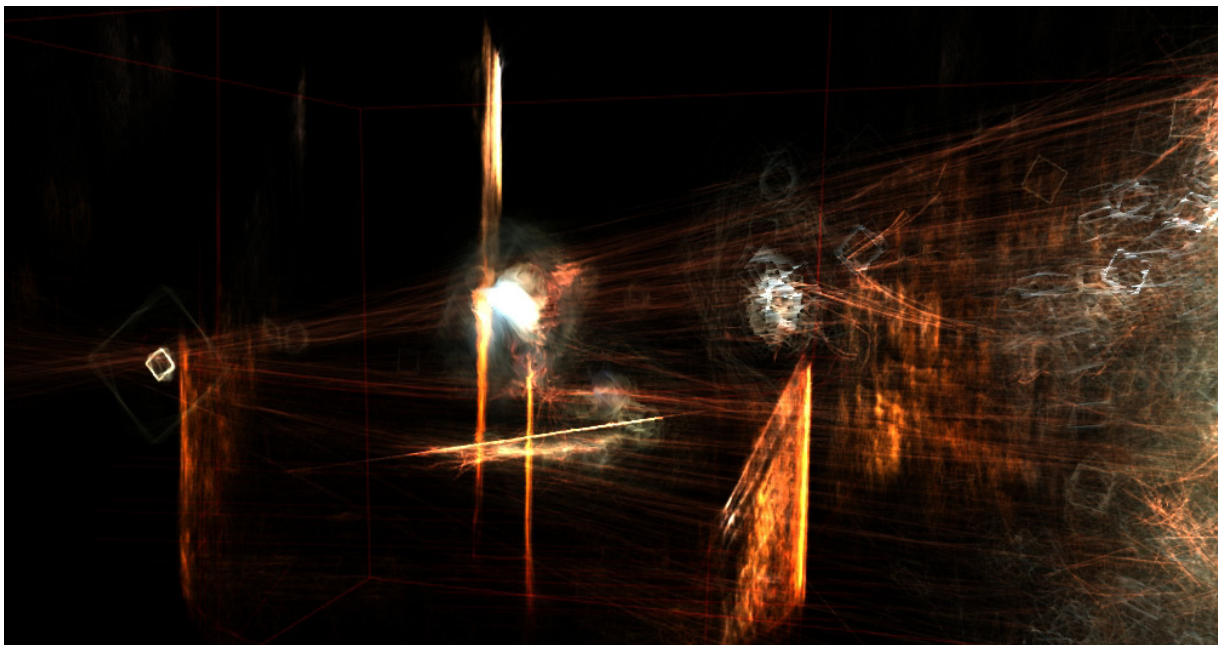
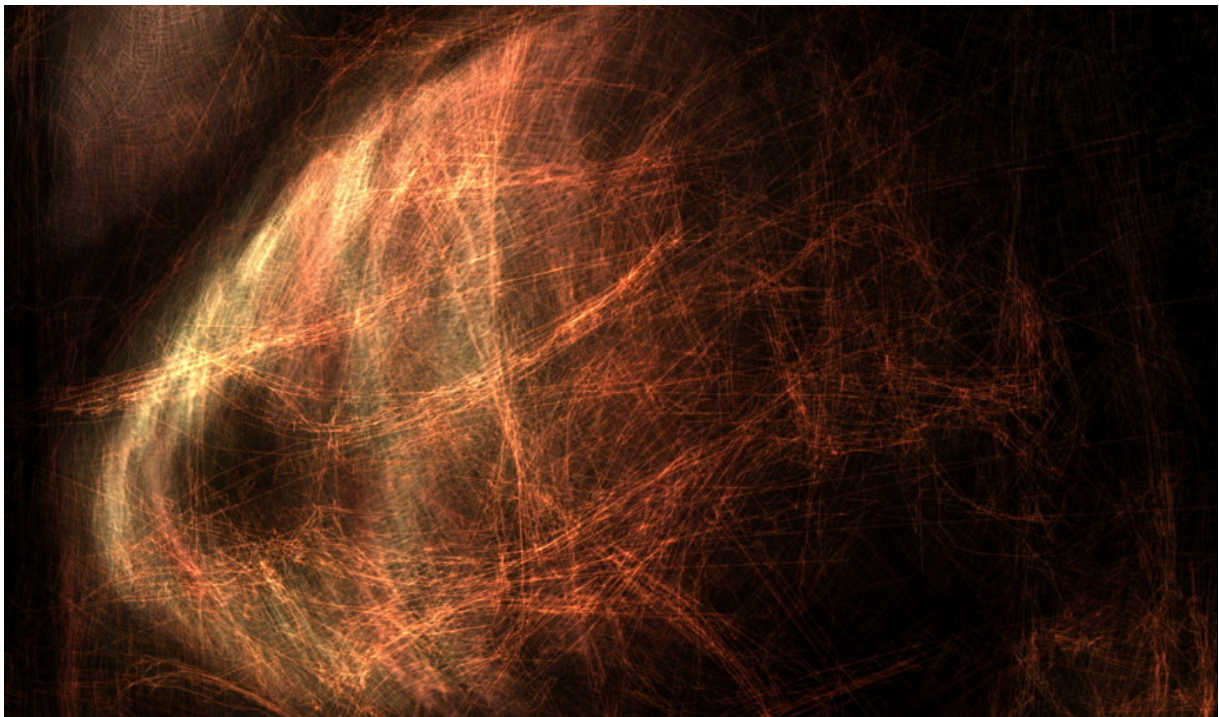
Into the Forest was commissioned by the Museum of the Moving Image, where it opened in January 2011.



Stairwell

Stairwell (2010), a site-specific 3D installation commissioned by London's Hayward Gallery, is a collaboration with dancer/choreographer Wayne McGregor, captured dancing in the same stairway that viewers later entered to see the piece. The imagery floats in three 3D projections stacked vertically on a wall closely opposite the circular stairs.

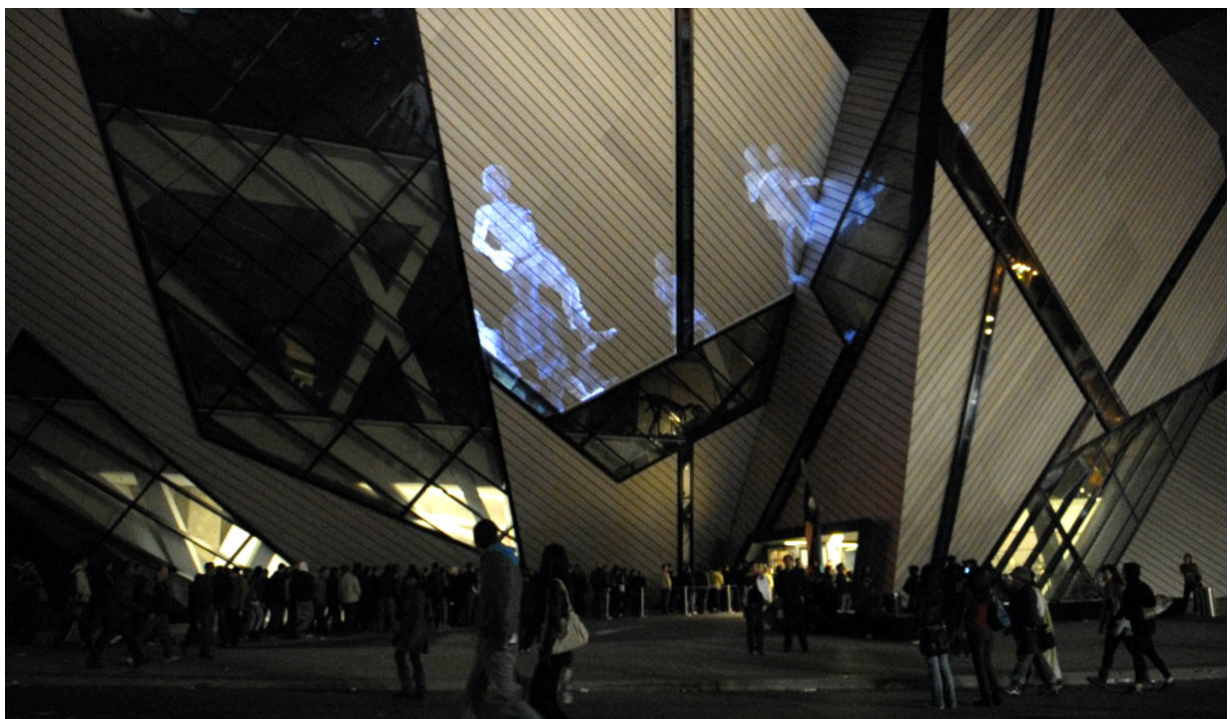
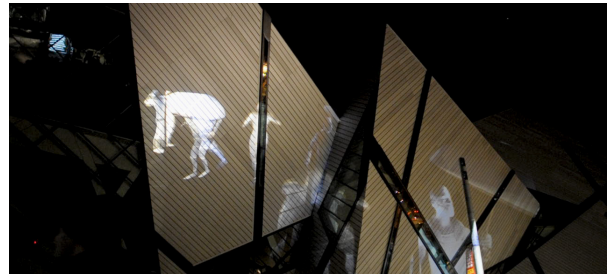
The 3D capture of McGregor is oddly elusive, with the imagery always striving — but often failing — to cast his figure as a solid sculptural form for each instant of his movement. There's a perceptual battle to tell figure from ground, for a curvature of the architecture is easily mistaken for that of a limb, the angle of a knee or elbow for that of a stair. In the ongoing effort to reconstruct three-dimensional forms, surfaces lurch towards and away from solidity in the most startling fashion, and it's only through its movement that the dancing body separates itself from its fixed surrounding, lifting into clear articulation before subsiding into the visual flux again.



Crossings

Crossings (2010) is a site-specifiable artwork — that is, one that can be rapidly and radically adapted to suit the space and context of a given site. It is especially suited for sites characterized by complex architecture and/or by multiple projections. It was configured for and all-night festival in Toronto, where it projected huge figures onto the facets of the “Crystal” facade, Daniel Libeskind’s extension to the Royal Ontario Museum.

Commissioned by Toronto’s Nuit Blanche.

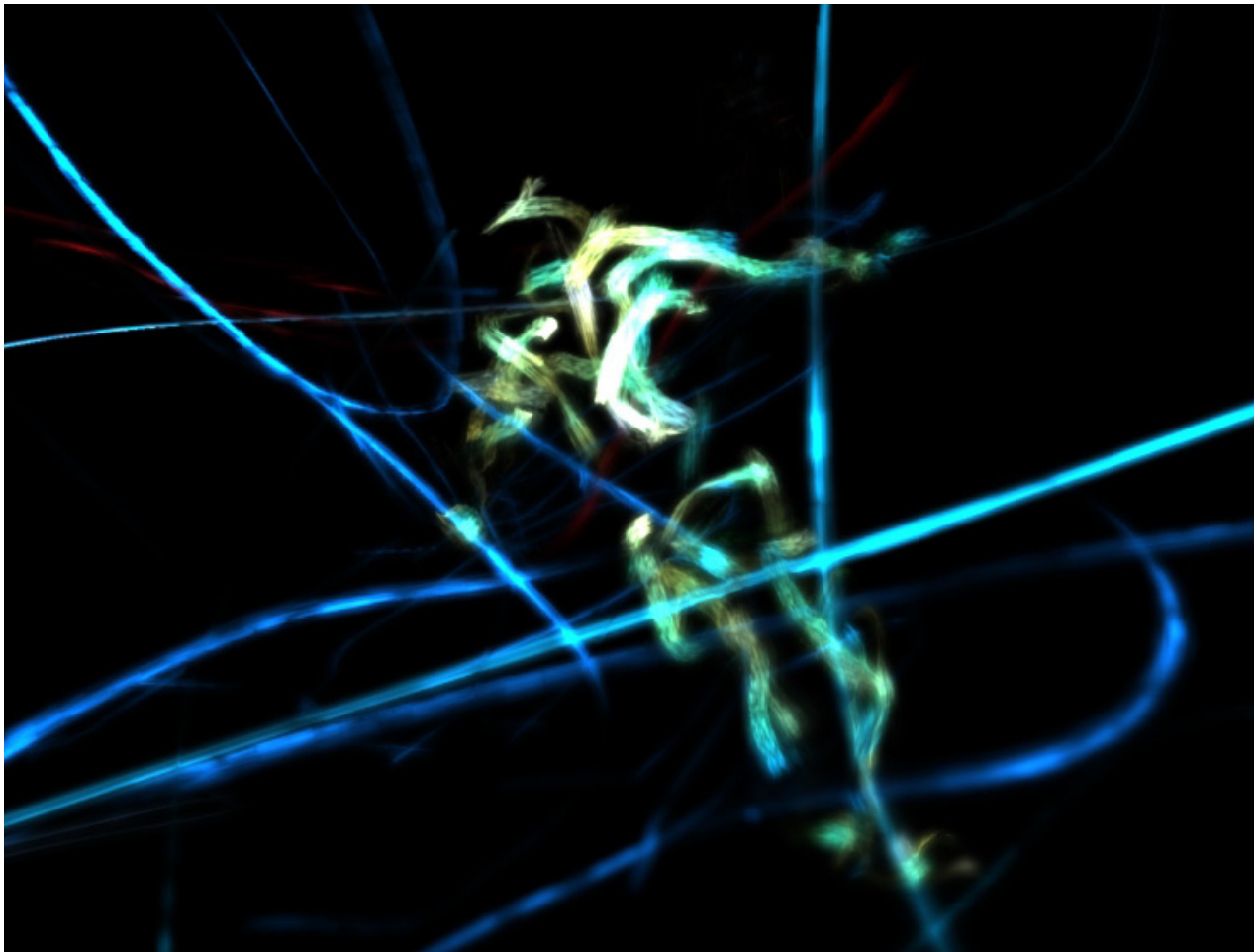


After Ghostcatching

After Ghostcatching (2010) is as much about touching with the hand as it is about seeing with the eye. A disembodied dancer is rendered as a moving hand-drawn sketch — and that sketch moves in a projected 3D space that can seem so close as to let the viewer reach out and touch it.

Though the work's imagery comes entirely from a computer simulation, it bears an unmistakable human trace — that of dancer Bill T. Jones, abstracted from his physical body via a process of optical motion capture that preserves his movement but not his likeness.

A re-envisioning of *Ghostcatching* (1999), *After Ghostcatching* is built up from a larger sampling of the motions and vocalizations of Bill T. Jones captured for the earlier work. It explores the themes of disembodiment and identity with the new possibilities opened up by 3D projection and a custom 3D renderer created in the OpenEnded Group's Field software.



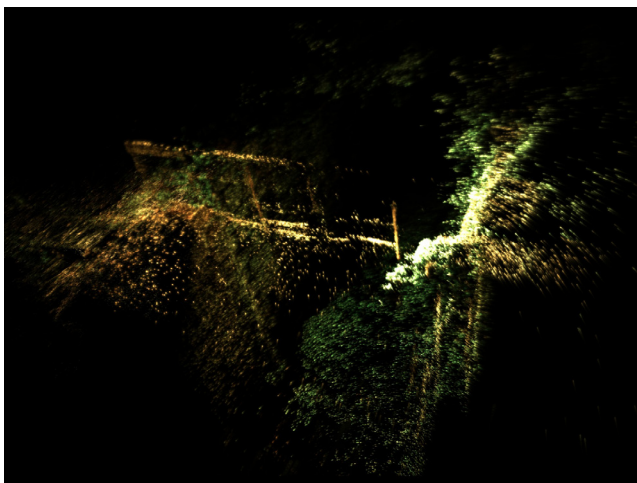
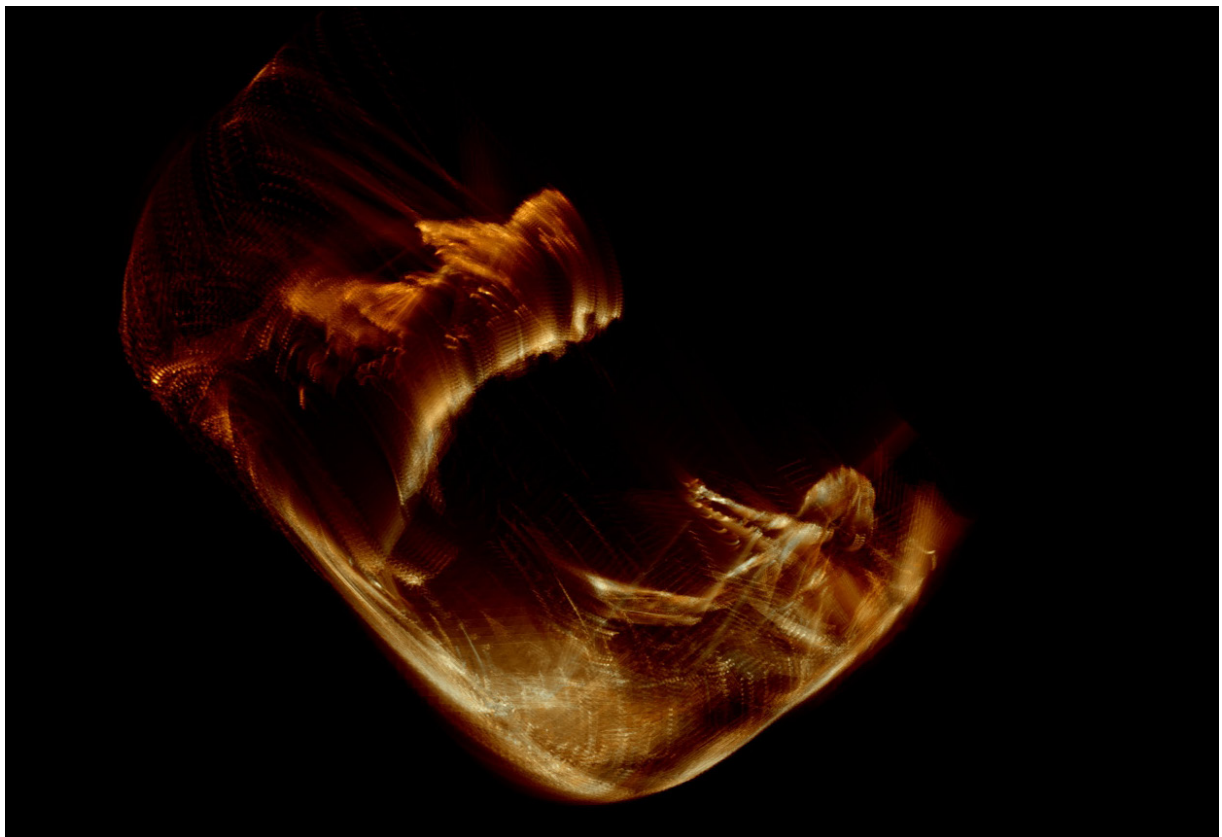
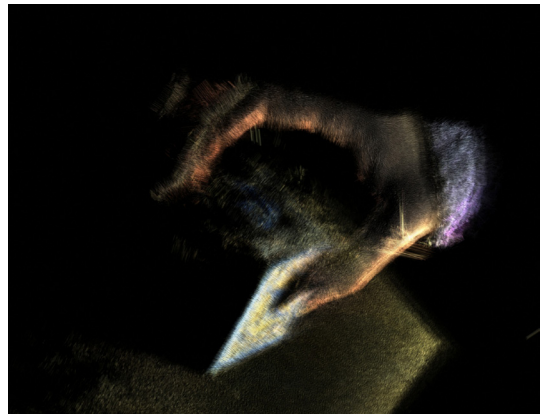
After Ghostcatching was commissioned by SITE Santa Fe.

Upending

Upending (2010) takes the form of live 3D cinema and has the viewers' eyes probing the projected imagery almost as if touching its light, feeling for the illusory surfaces of things as they cross the threshold from abstraction to likeness. At 86 minutes, this evening-length work enacts a drama of dislocation and re-orientation, with viewers becoming exquisitely aware of their own perceptual processes and of the their minds' continual attempt to spin out meaning from what their eyes take in.

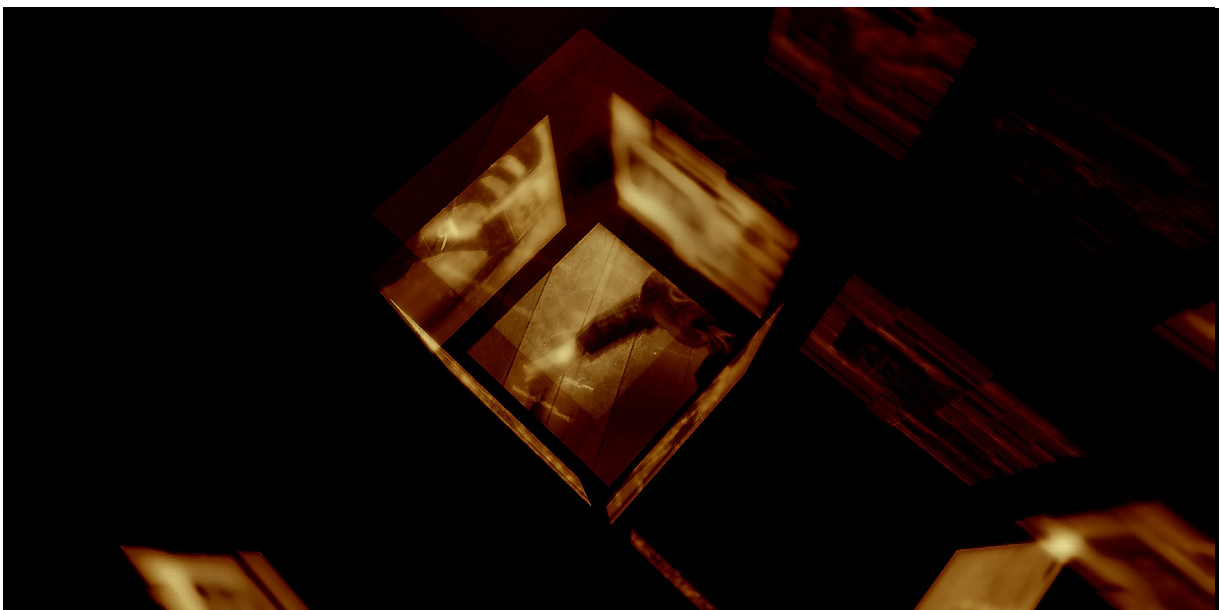
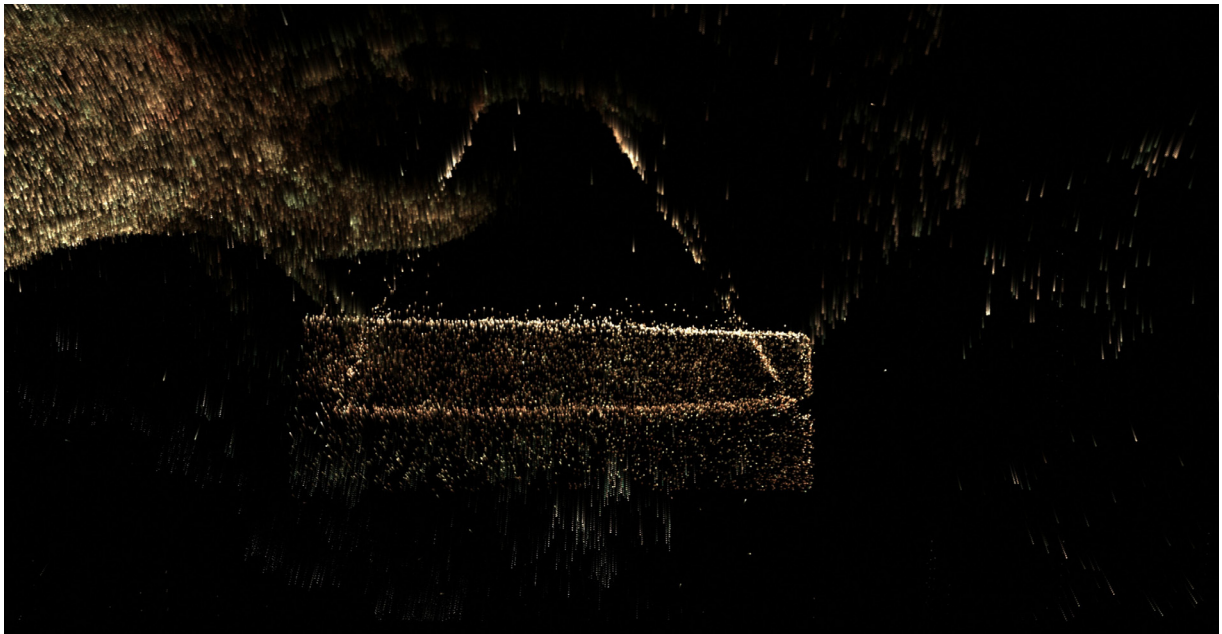
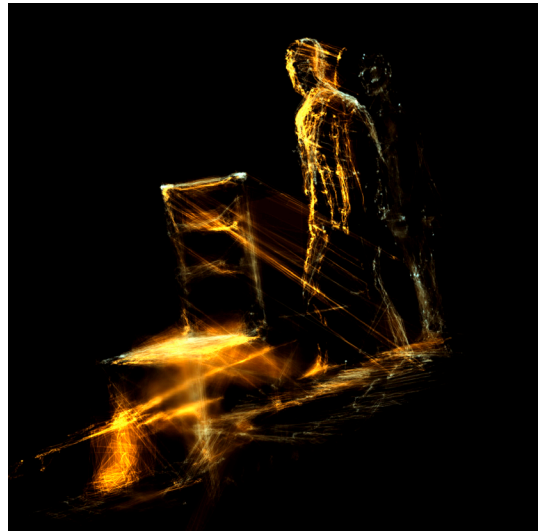
The play of images is accompanied by a new special recording of Morton Feldman's first String Quartet as performed by the FLUX Quartet. This places the listener, literally, in the center of the ensemble, with every sonic gesture articulated across space simultaneously.

Commissioned by EMPAC, Upending premiered there in March 2010.



TECHNICAL SPECIFICATIONS:

- 2K digital cinema 3D projection — may be reconfigured as a multi-room installation
- runs from MacPro using custom software — this allows the stereoscopic convergence and composition to be tuned for the dimensions of specific venues
- uses 120hz active-shutter glasses — adaptable to other systems
- 4-channel audio in four full speaker systems in each corner of the venue



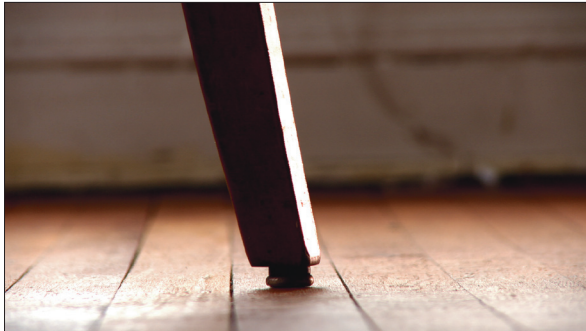
Housebound

Housebound (2008) is a stereoscopic installation that uses motion stabilization and geometry recovery in order to place narrative text into the illusory depth of subjective hand-held camera shots. Commissioned by Le Fresnoy: Studio des arts contemporains, the stereoscopic depth of *Housebound* is of film-like resolution, shot with paired cameras streaming uncompressed HD video directly to two computers.

Housebound tells the story of a woman trying reconstruct the eccentric thoughts of her deceased lover by “reading” the spaces of his now mostly vacant apartment. We gaze out his windows at the sky and at the bustling streets of upper Manhattan; we inspect his chair, his desk, and his bedframe; we scrutinize a light fixture and outlet, a sink and a stovetop, a drinking glass and a spoon, an intercom and a hallway.



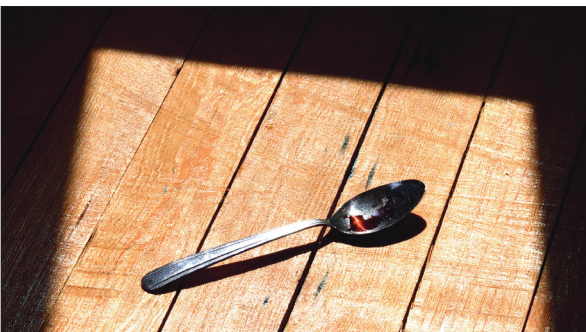
6. adjusting



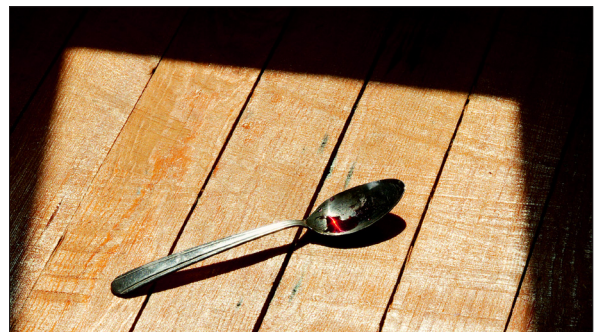
12. feet cold



25. superimpose

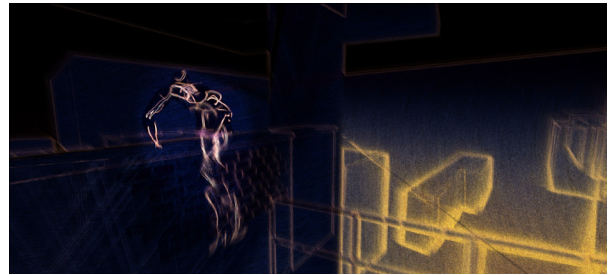


66. no French kissing



Point A → B

Point A → B (2007-9) is an installation that takes the urban sport of parkour as its point of departure. Just as the *traceur's* goal is get from point A to point B as rapidly, as inventively, and often as dangerously as possible, so too do the virtual figures encounter a vertiginous world where action, perception, and location are continually overturned. This sensation is heightened for the viewer by the two parallel projections of the piece, which only rarely coalesce into a continuous panorama — more often they divide the space like a chasm.

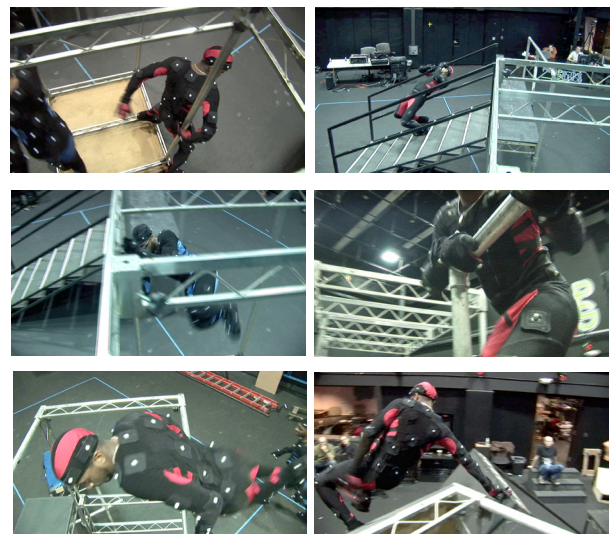


installation at the Pro Arte center in St. Petersburg, Russia

For both figure and viewer, it is hard to traverse the space of *Point A → B* since it seems mainly conjectural, as if its design had been left incomplete on the architect's drawing board. The built terrain is under mental construction, the process of which is everywhere evident in generic cubes, wireframe scaffolding, place-holder masses, stock elements, translucent surfaces, and cut-away and cross-section views.

The artwork is composed for two screens, set to be inclined towards each other, as pictured above in this installation photo from Pro Arte in St. Petersburg.

Point A → B was commissioned by Capture05 and with the support of the English and the Scottish Arts Councils. Project partners included Urban Freeflow, the Jerwood Space, and the Centre for Contemporary Arts (Glasgow).

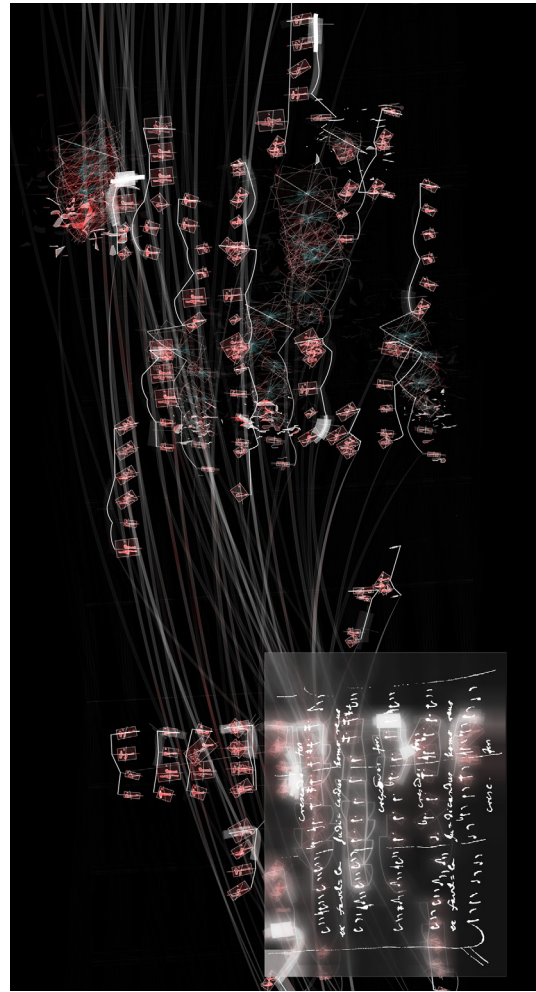
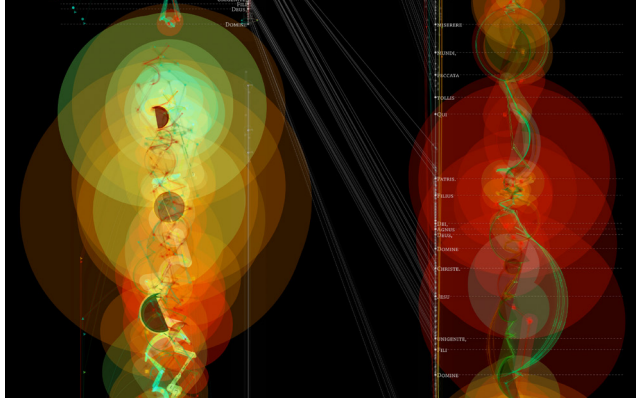


Motion capture with traceurs practicing parkour

Breath

Breath (2007) is a site-specific public artwork for Lincoln Center that explores the idea of sacred music through an interlocking series of banners and lightboxes, the lighting of which is coupled to the ebb and flow of a live musical composition. The imagery of each lightbox arose from a computer-assisted analysis of a given subject, finding patterns in information often so dense as to elude manual search.

Breath was commissioned by Lincoln Center.

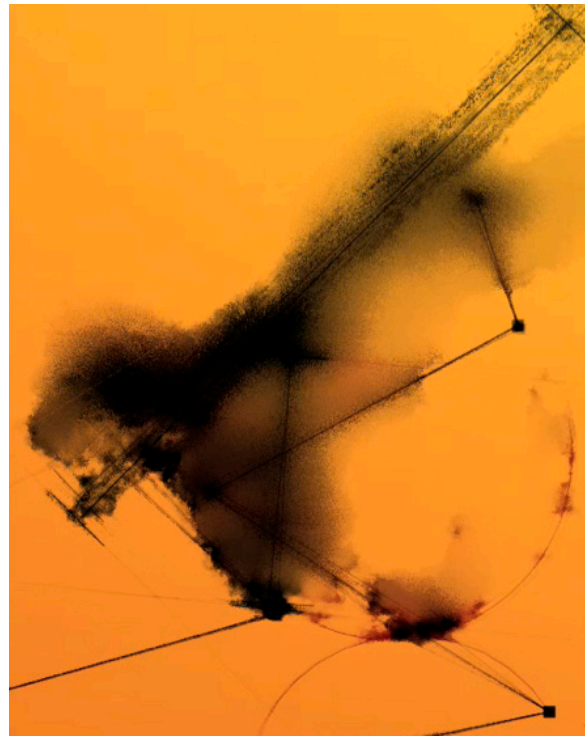
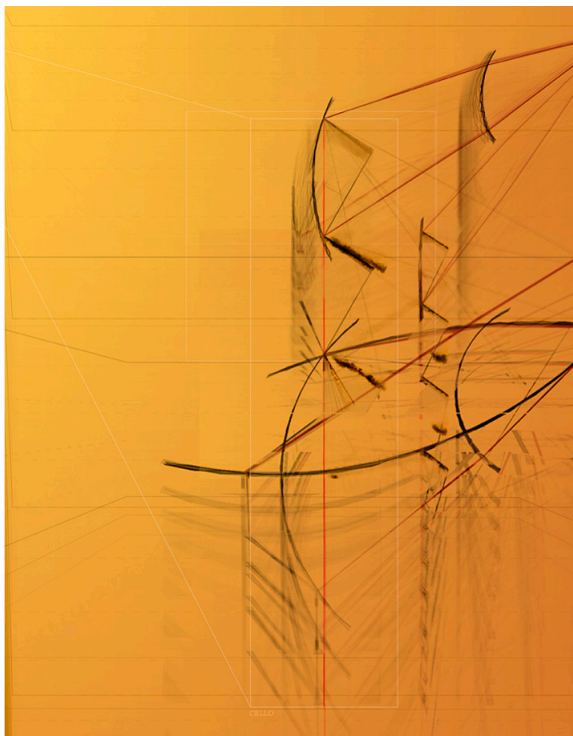
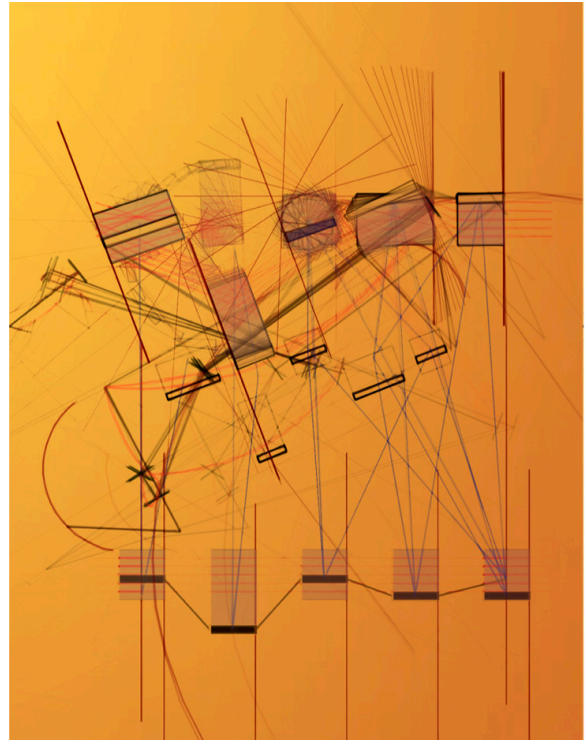
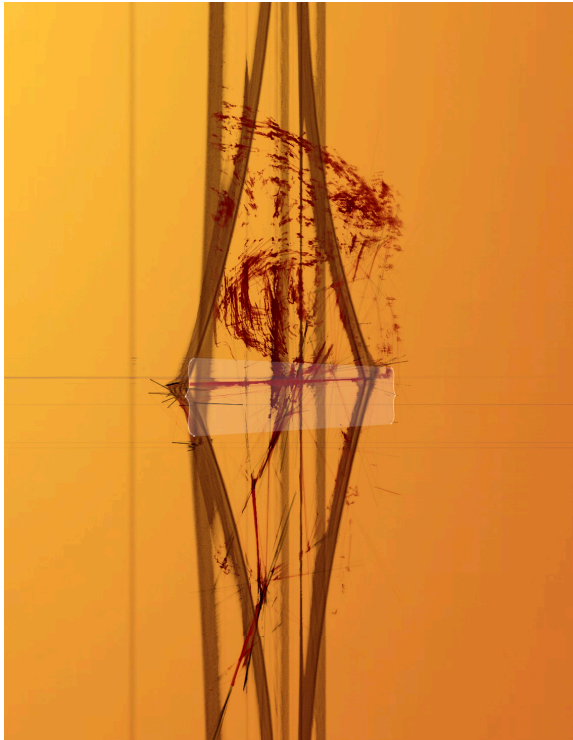


Enlightenment

Enlightenment (2006) is a live public digital artwork that actively investigates, visualizes, and reconstructs the deeper musical structures of Mozart by means of artificial intelligence and realtime graphics.

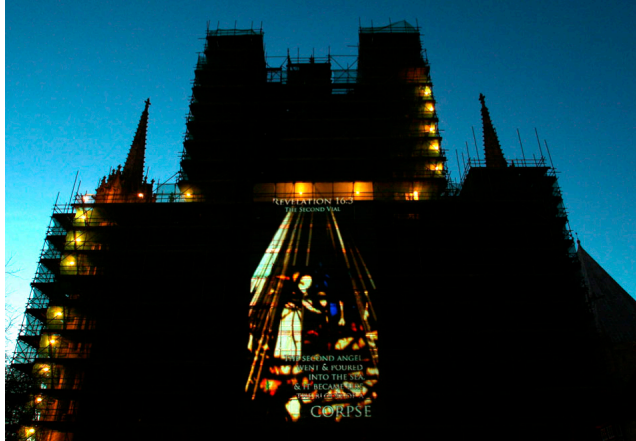
Enlightenment applies Information Age methods – akin to DNA sequencing and data-mining – to make new sense of Mozart, a quintessential figure of the Age of Enlightenment. More precisely, it solves a problem of its own making – to intelligently reconstruct Mozart's most intricate musical structure (the coda to the "Jupiter" symphony) with a minimum of prior musical knowledge.

Enlightenment was commissioned by Lincoln Center, with sponsorship by Jerome L. Greene Foundation and The Peter Jay Sharp Foundation.



Recovered Light

Recovered Light (2007) is a site-specific public artwork created for the York Minster in England. Projected directly on the scaffolded eastern facade of the cathedral, it acted as a kind of massive virtual x-ray (90' tall), peering through the scaffold at a masterpiece of 15th century stained glass, the Great East Window. The piece ran live for five hours every evening, taking more than seven hours to complete a single cycle of its never-repeating imagery. It is now on permanent display inside the Minster.



Recovered Light “solves” the puzzle of each main stained glass panel by magnifying its key elements and then reassembling them as if they were pieces in a complex jigsaw puzzle, matching the corresponding biblical passage with the given scene. In the process, it brings to light the expressive faces and vivid scenes from the past, many visible for the first time. Since this act of recovery runs live, the reassembly and magnification of a given panel never quite repeats from one cycle to the next.

The artwork does not perform a simple act of visual restoration; rather it performs an intricate act of artistic retransformation. It is a creative response reaching back across time from the 21st century to the 15th, its bright projected beam providing a new sun for the darkened glass.



Discovering network of image boundaries



Second network joining centers of bounded areas.



Recovered Light was commissioned by Illuminating York with support from the York Minster.



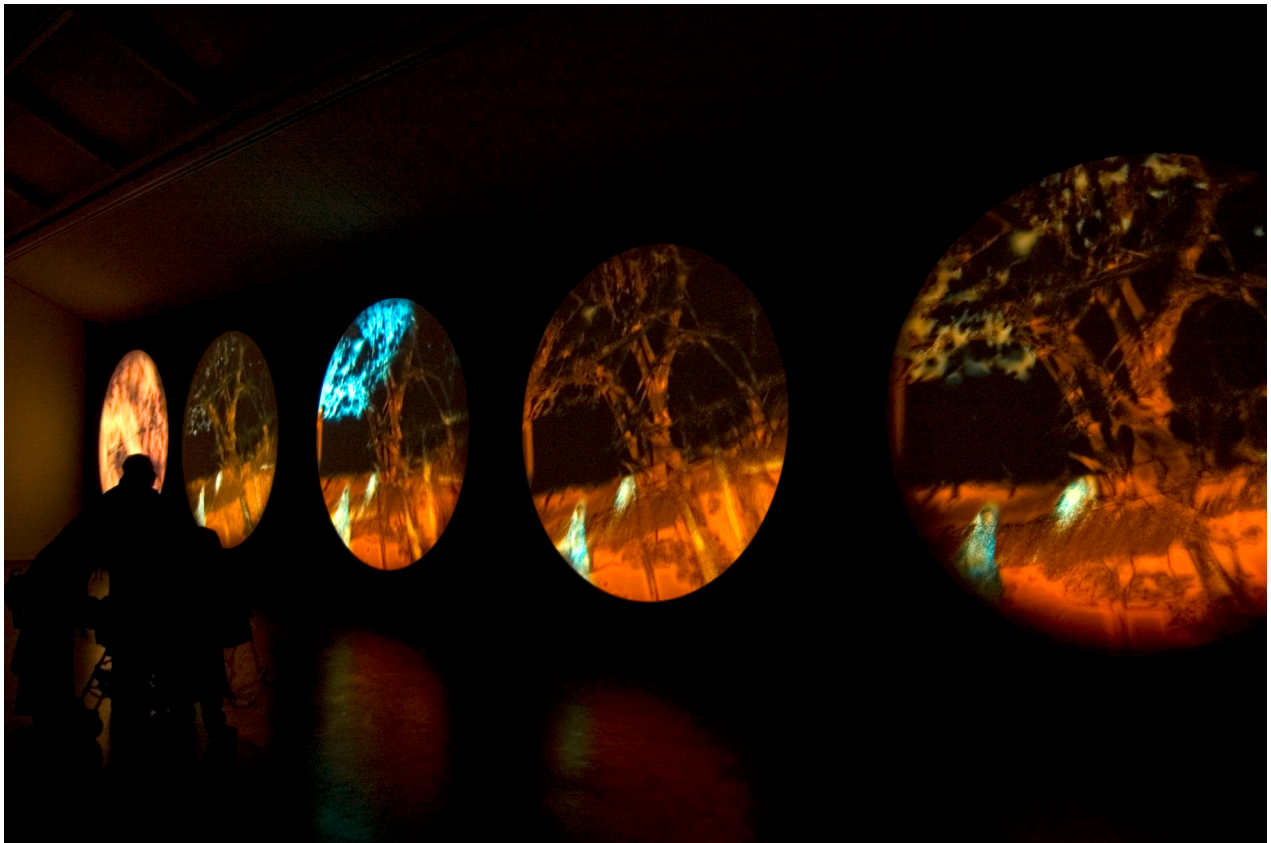
Both analyses used to select parts & recompose the whole.

Forest

Forest is a visual enactment of outdoor games played in childhood. In this five-screen live installation, virtual children wander through a forested parkland playing hide-and-seek among the tree-trunks. They swing dizzily on monkey bars, then clamber up among the branches overhead. They lose themselves in reverie and then re-encounter each other in the forest. The children's movements are uncannily life-like, for they are drawn from an extensive library of motion-capture data created specifically for *Forest*.

It's not just the children playing in this fashion — for the imagery itself plays similar games across the five circular projections.

Each of its portholes looks out on the same forest scene, but these views are in dynamic disequilibrium with each other. One porthole may decide to jump to a different camera angle, for example, and the adjacent views will then struggle to catch up with that new angle. Another porthole may choose to switch its color relations, and again the others may try to shift theirs in the same direction.



installation at the Centre for Contemporary Arts, Glasgow

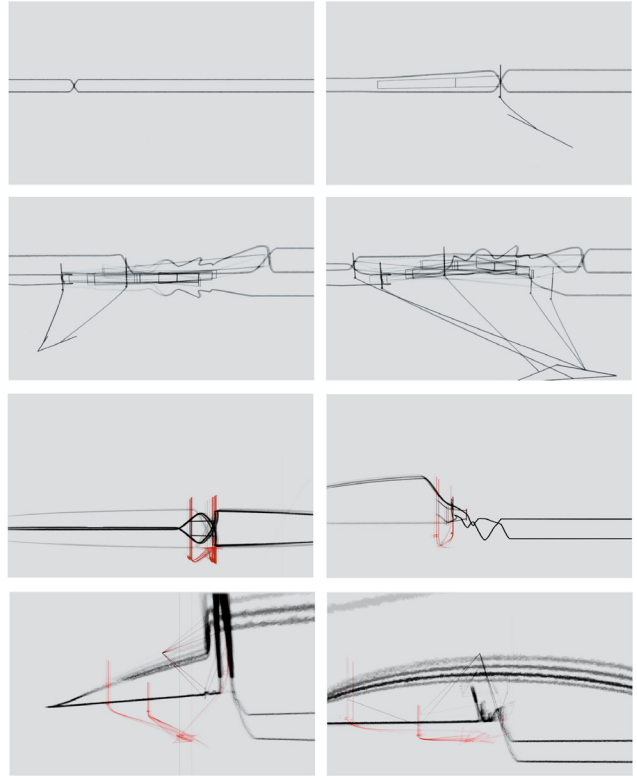
The circular frame of each projection plays odd tricks with perception, gently undermining the viewer's sense of gravity, especially when the camera angle rolls slightly.

The rich ambiguity of visual perception is intensified by the "visual physics" embedded in the custom 3d renderer created for the work. For example, the renderer can conjure up the moving image out of the propagation of its own grain.

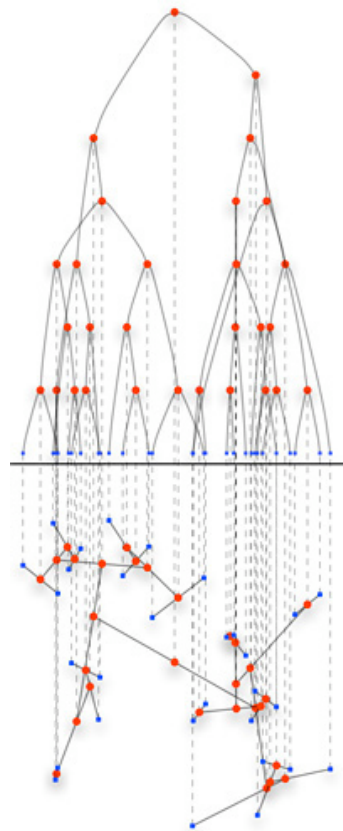
Forest was created with support from *Dancing in the Streets*, the *Greenwall Foundation*, the *New York Foundation for the Arts*, *Renew Media*, and the *Rockefeller Foundation*

— how long does the subject linger on the edge of the volume —

In how long does the subject linger on the edge of the volume... (2005), projected imagery responds in real-time to the motion-captured live performance of the Trisha Brown Dance Company. The imagery has a mind of its own, as it were, since an artificial intelligence program determines the exact picture at any given point in time. It detects patterns and relationships in the choreography as it unfolds, which it represents in pictures that continually re-adjust themselves to the dancing.



Weaving: A very simple agent constructed from a hidden creature that looks only at the ordering of the dancers, from front to back, and tries to retrace this ordering by weaving a set of lines in space.



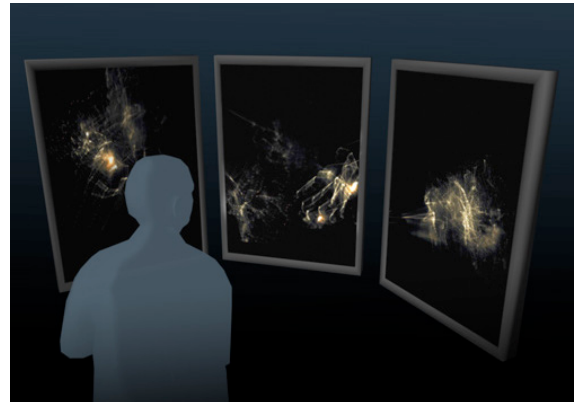
Tree: Tree constructs a skeleton for an offline captured solo and re-injects it into the piece, partially overlapping with the performance of the solo itself.

how long... was commissioned by Arizona State University with additional commissioning support from Lincoln Center. It was supported in part by the National Endowment for the Arts, the National Science Foundation, Motion Analysis Corporation, Arizona Public Service, and City of Tempe Cultural Services.

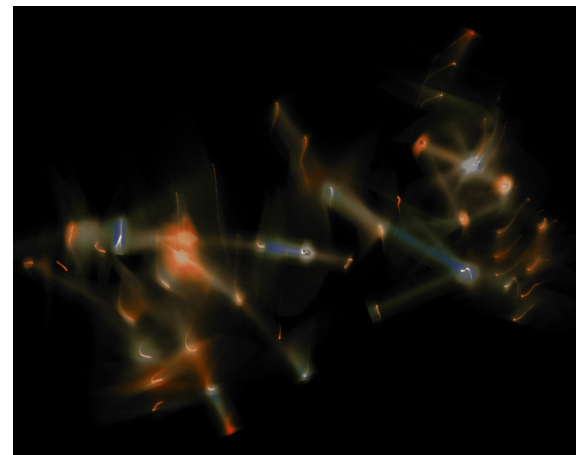
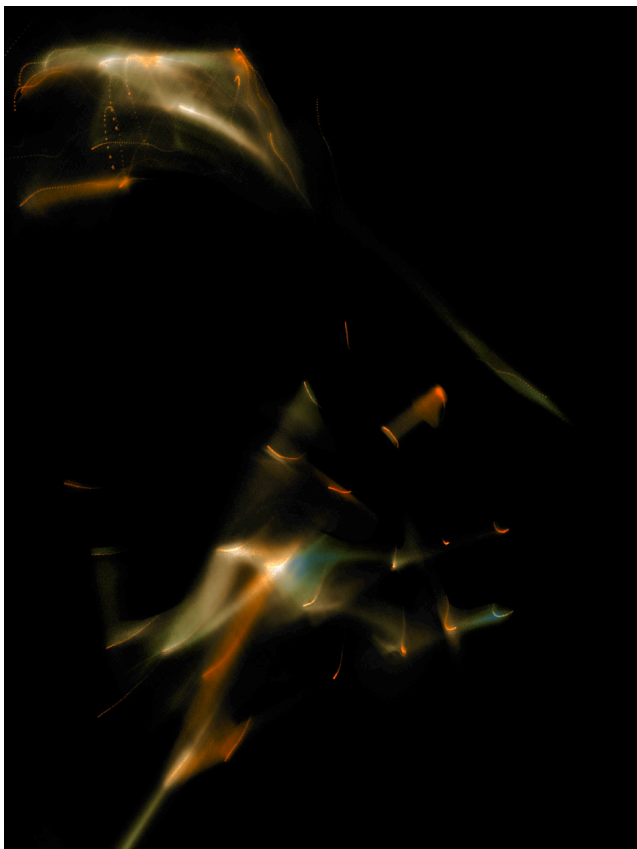
Loops

Loops is an abstract digital portrait of Merce Cunningham that runs in real time and never repeats. Originally commissioned in 2001 by the M.I.T. Media Lab for the “ID/Entity” show, its sound score was remade for Ars Electronica in 2005. In 2007 it was re-created in triptych form and its underlying code released as open source and Cunningham’s choreography released under a Creative Commons license.

Loops is a portrait of Cunningham, but it attends not to his appearance, but to his motion. It is derived from a motion-captured recording of his solo dance for hands and fingers. The motion-captured joints become nodes in a network that sets them into fluctuating relationships with one another, at times suggesting the hands underlying them, but more often depicting complex cat’s-cradle variations. These nodes render themselves in a series of related styles, reminiscent of hand-drawing, but with a different sort of life. Many viewers liken their experience of seeing *Loops* to that of gazing into nature: its flickering motions put them in mind of fire or of primitive biology, perhaps seen under a microscope.

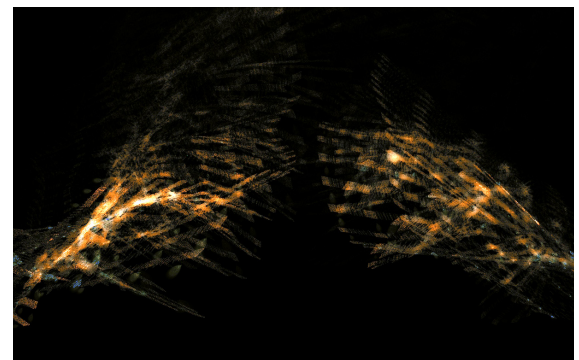


In its current triptych arrangement, three views of *Loops* are presented. The central screen has the virtual camera facing Merce’s hands directly, while the flanking screens give sideways views from the left and right respectively.



Just as Cunningham’s motions generate the imagery in *Loops*, we now use his voice to generate the music. The initial source is Cunningham reading diary entries from his first visit to New York City in 1937, when he was 17 years old—an old man’s voice evoking an earlier city and an earlier self. Later we had the idea was that if we had Cunningham speaking, then we would have John Cage listening to him, at least virtually. And so we propelled the intonation and rhythm of Cunningham’s sentences into a virtual instantiation of Cage’s prepared piano.

Additional support for Loops was provided by the John Cage Trust, Modern Uprising Studios, and the Mellon Foundation.



Pedestrian

Pedestrian (2002) is a public artwork that projects its imagery directly down onto a city sidewalk. Its digital projection merges with the rough surfaces we walk upon: the tiny denizens we see down there wander through a *trompe l'oeil* illusion in a city that seems to float both upon and within that surface. First presented in 3 public spaces in New York City, *Pedestrian* has since been exhibited in numerous locations in Asia, Europe, and the US.



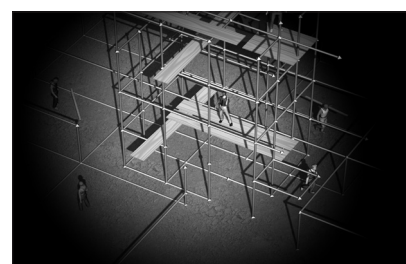
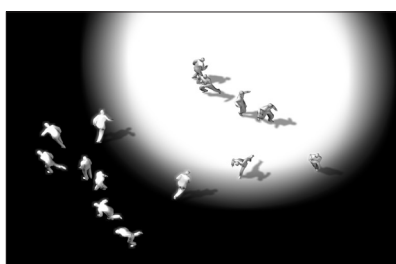
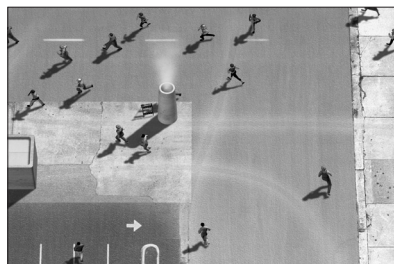
Pedestrian at the Studio Museum of Harlem



Pedestrian at Rockefeller Center

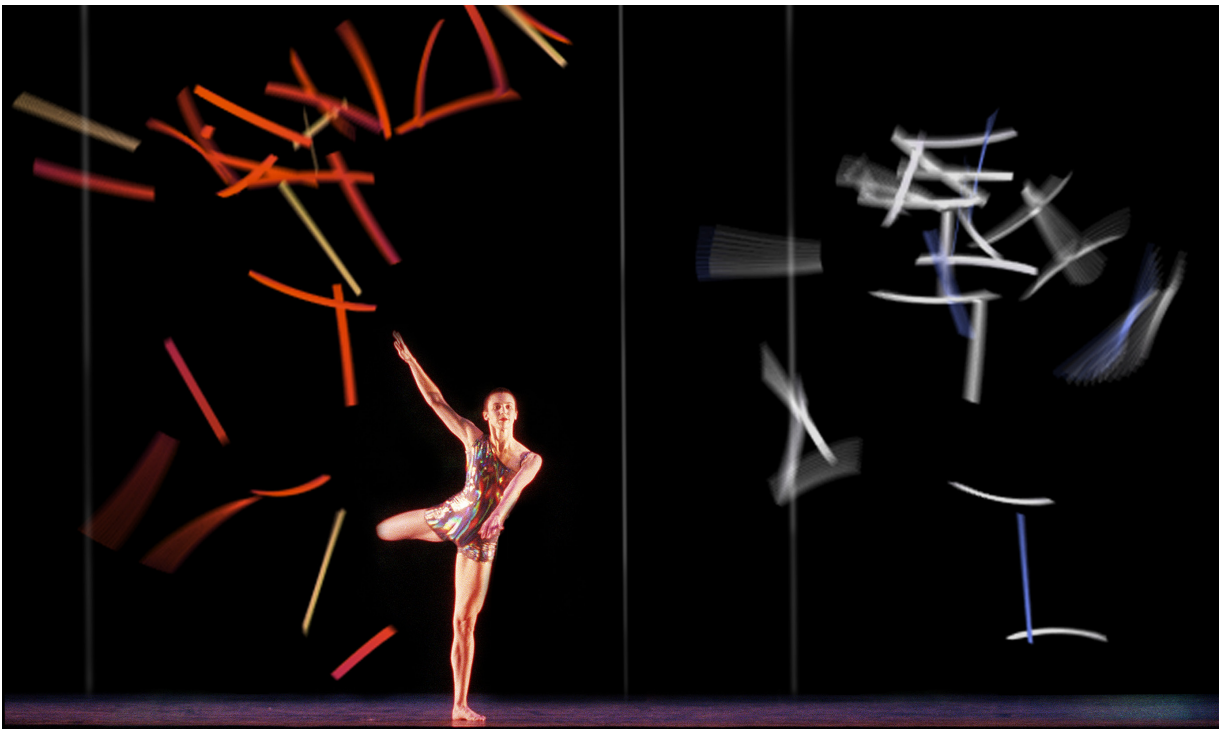
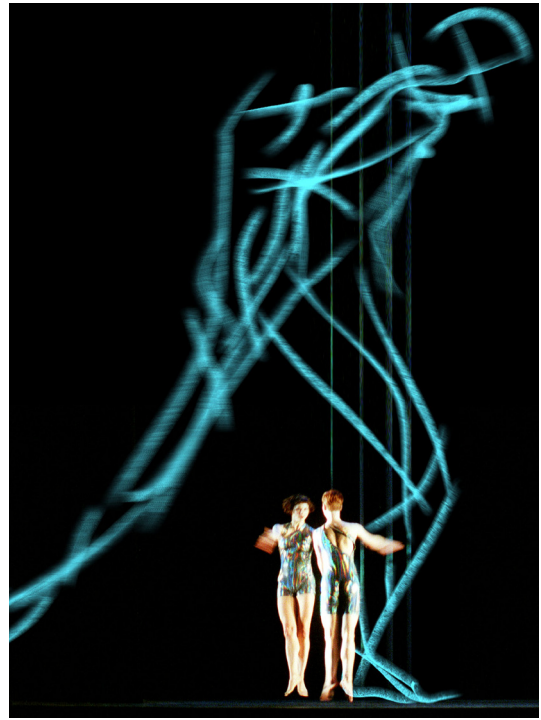
The environment under the tiny feet of *Pedestrian*'s figures is an abstract and simplified gameboard of Manhattan, with strong contours and rhythmic subdivisions. These grids, tiles, and area boundaries echo and emboss the real physical pavestones hit by the projection. We the viewers, with our tall, dark bodies, stand in for the buildings of Manhattan's verticality.

Pedestrian was co-produced by Art Production Fund and Eyebeam. Additional support came from *Dancing in the Streets*, with public funds from the New York State Council on the Arts; the University of California: Irvine; and Unreal Pictures.



BIPED

BIPED (1999) is an extended digital animation that serves as the visual décor for a dance of the same name choreographed by Merce Cunningham. The movements are largely derived from motion-captured phrases from the choreography, which drive abstracted images of hand-drawn dancers moving through spare and evocative spaces. *BIPED* is the most widely seen of any Cunningham dance; it has been performed numerous times throughout the world.



In performance, the imagery is projected on a huge transparent scrim covering the front of a large proscenium stage, giving the illusion that it floats in front of and among the live dancers behind it.

The BIPED projections were supported by the AT&T Foundation, the Andy Warhol Foundation for the Visual Arts, Compaq Computer, and Discreet/Autodesk.

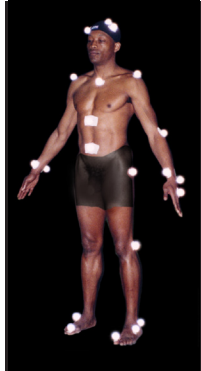


Ghostcatching

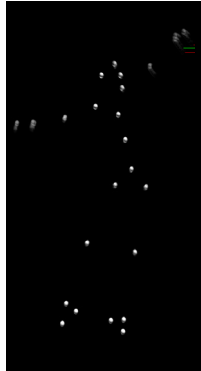
Ghostcatching (1999) is a digital art installation that fuses dance, drawing, and computer composition. Based on the motion-captured dance phrases of choreographer Bill T. Jones, the work is a meditation on the act of being captured and of breaking free.



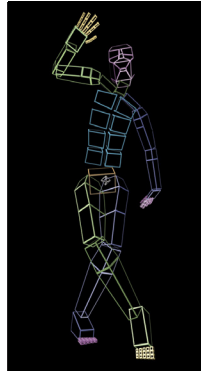
Bill T. Jones improvising



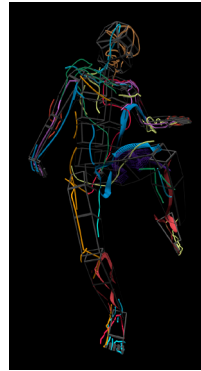
Motion-capture markers



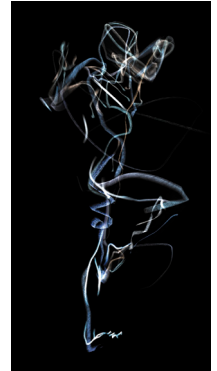
Optical conversion to 3D



Motion files on 3D skeleton



"Hand-Drawn" anatomy



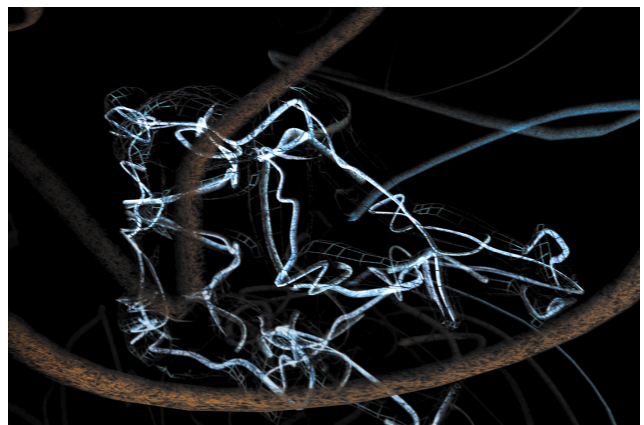
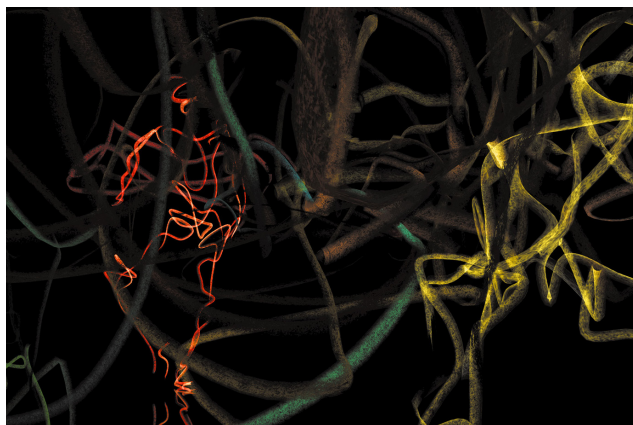
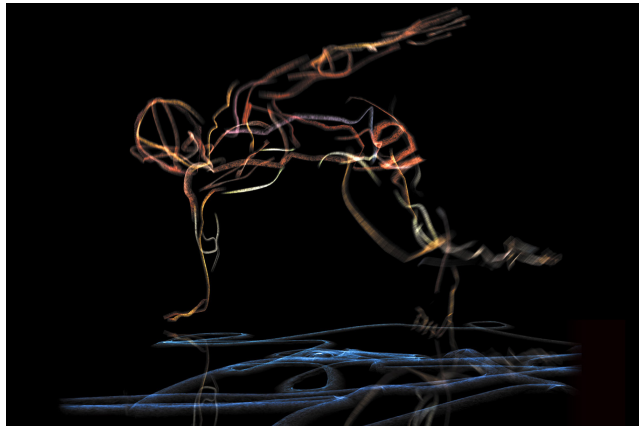
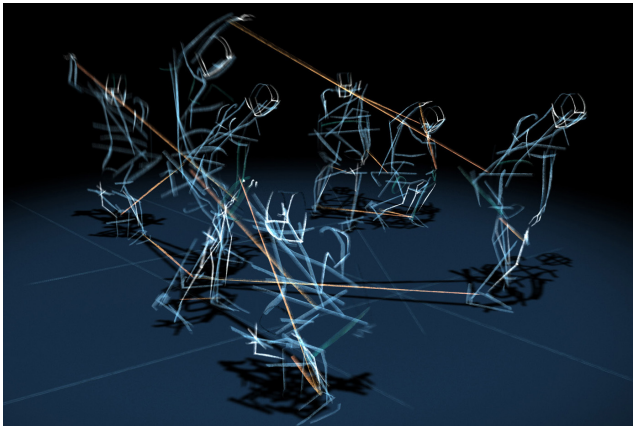
Final drawn body

Captured dance phrases are the building blocks for the virtual composition. As data, the phrases can be edited, re-choreographed, and staged for a digital performance in the 3D space of the computer. Here, the body of Bill T. Jones is multiplied into many dancers, who perform as three-dimensional drawings. Their anatomies are intertwining of drawn strokes, which are in fact painstakingly modeled as geometry on the computer — never drawn on paper.

Commissioned by the Cooper Union for the Advancement of Science and Art, with further support from the Keith Haring Foundation, the Estate Project for Artists with AIDS, and the Foundation for Contemporary Arts.



Jones developing material at The Cooper Union, 1999.



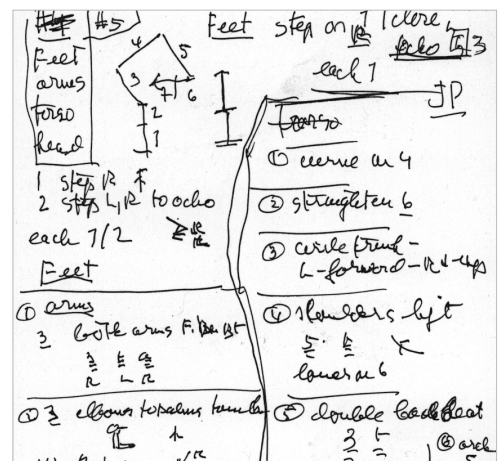
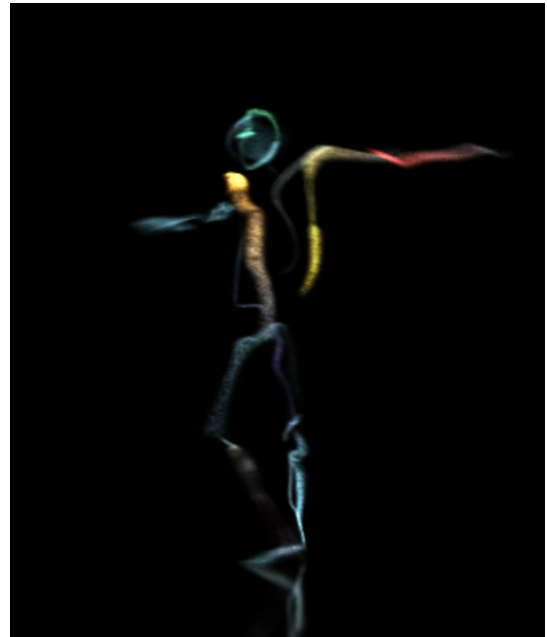
Hand-drawn Spaces

Hand-drawn Spaces (1998, 2009) is a virtual dance installation that presents a mental landscape in which motion-captured hand-drawn figures perform intricate choreography in 3D. Commissioned by SIGGRAPH as a massive 3-screen projection, it was created in collaboration with Merce Cunningham (choreography). Designated an NEA “masterwork” in 1999, it was restored with a new surround soundtrack.

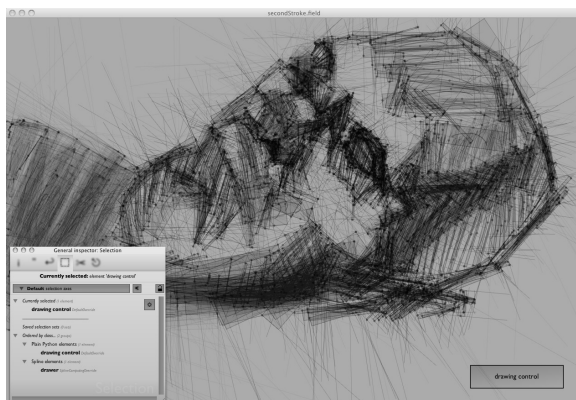
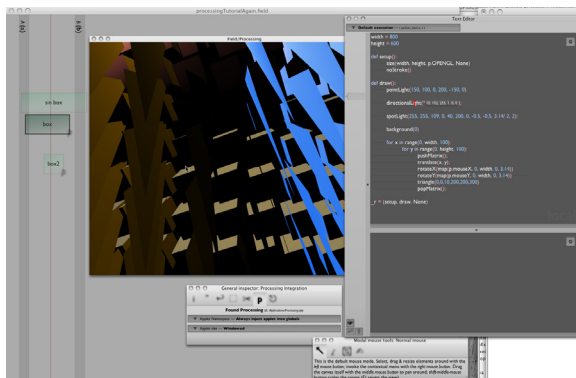
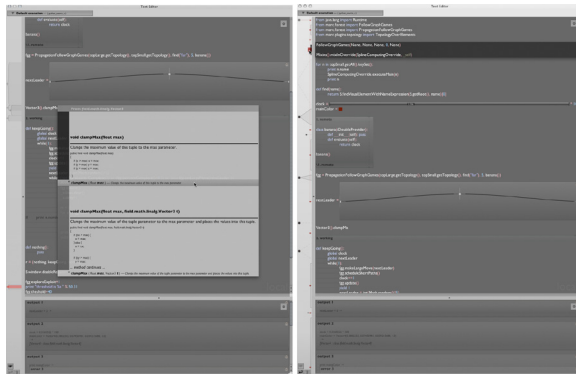
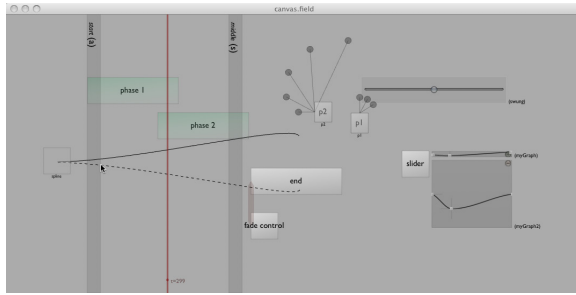
The virtual dancers appear as life-size drawings emerging from the darkness and moving in an apparently limitless three-dimensional space. Though the dancers are visible on three screens, they move through a much larger virtual area, and so travel in and out of projected image, often traversing the spectators' space. The spatial sound-score by Ron Kuivila evokes their positions in space, making their presences felt even when not seen.

A smaller gallery version was exhibited at the Wexner Center for the Arts, the Barbican Centre, and many other venues.

Created with support from the The National Dance Residency Program, a grant program underwritten by the Pew Charitable Trusts and administered at The New York Foundation of the Arts; The Foundation for Contemporary Art; Harvestworks; and the National Endowment for the Arts.



Field (open source software)



Field is a software project initiated by OpenEnded Group, for the creation of their digital artworks. It is an environment for writing code to rapidly and experimentally assemble and explore algorithmic systems.

Based on ideas started at the MIT Media Lab, *Field* was in development in-house since early 2001. In 2008 we released it as an open source platform for use not only by other digital artists, but also choreographers, architects, and engineers.

More than an authoring system, *Field* is in fact a system for creating authoring systems (a “meta authoring system,” if you like). It allows users to fashion their own authoring environment for any given project; and as they work they can continue to adjust and even to recast this environment as the need arises.

Field underpins all of our artworks since 2002 — for example *Enlightenment* (2006), the AI exploration of Mozart’s final symphony we made for Lincoln Center; *Loops* (2001-8), an abstract portrait of Merce Cunningham; and *how long does the subject linger on the edge of the volume...* (2005), a live motion-capture stage performance created with Trisha Brown.

The *Field* project has received support from the Mellon Foundation, the National Endowment for the Humanities, Portland Green Cultural Projects, the Experimental Media and Performing Arts Center (EMPAC), Georgia Tech, and the National Science Foundation.