Lynn Hershman Leeson
b. 1941; Cleveland, OH

Lorna, 1979–84
Video, color, sound; with television, interactive laser disc shown as DVD, modified remote control, television cabinet, night table, end table, wood chair, upholstered chair, mirror, fishbowl with plastic goldfish, clothing, wallet, belt, shoes, watch, telephone, magazines, framed storyboards, and framed art

Collection of the artist; courtesy Bridget Donahue, New York

Lynn Hershman Leeson's *Lorna* is one of the earliest examples of interactive art of the 1970s to explore nonlinear storytelling. It is also the first interactive artwork on laser disc, a now obsolete digital-storage technology that was introduced commercially in the late 1970s. The project invites visitors to use a remote control to navigate Lorna's branching story, which unfolds on the television screen. The installation mirrors the environment that Lorna, an agoraphobic fearful of leaving her apartment, inhabits in the TV set. Depending on the path chosen, there are three possible endings to the narrative: death, escape, or the destruction of the TV. The work addresses the role of women in mediated society, with its interaction mechanism serving as a metaphor for the ways in which Lorna is "remote controlled" by society and her televised existence.

Please use the remote control to navigate through the work.

Josef Albers
b. 1888; Bottrop, Germany
d. 1976; New Haven, CT

Six works from the portfolio *Ten Variants*, 1966
Screenprints

Four works from the portfolio *Homage to the Square*, 1967
Screenprints on board

Whitney Museum of American Art, New York; gift of the artist 67.64.1–10, 68.1.1–12

Josef Albers began his *Homage to the Square* series in the summer of 1949 and made more than a thousand related works over the next twenty-five years. He developed four layouts, three composed of three squares each and the fourth composed of four squares. "The scheme of the Homages has no real aesthetic consequences by itself," he explained. "There were hundreds of possibilities, but since my main problem is color . . . let's have a scheme, a cooking pot that cooks for four people, and no more. Therefore, let the colors react in the prison in which I put them." Like a composer writing variations on a single melodic theme, Albers created countless color combinations in which the effect of individual colors changes markedly from work to work, demonstrating the variability of our perception of color.

Hear about the systems Albers used to explore color.

601

John F. Simon Jr.
b. 1963; Shreveport, LA

Color Panel v1.0, 1999
Software, altered Apple Macintosh Powerbook 280c, and plastic

Whitney Museum of American Art, New York; purchase with funds from the Painting and Sculpture Committee 99.88a–c

Color Panel v1.0 is a piece of software art displayed on components of a laptop computer modified by the artist, John F. Simon Jr. The software "controls the screen, draws the composition, picks the colors, [and] moves the colors," producing constantly evolving compositions of squares and rectangles that deliberately evoke early modernist geometric abstraction. Simon cites the influence of Josef Albers—whose work is on view nearby—and Johannes Itten, who investigated the apparent changes in hue caused by placing different colors next to one another. Simon addresses the same principles through software that explores color mixing in motion and over time. In each section of the screen, the software chooses from groups of possible color combinations without specifying the exact color to be picked. The color composition is therefore variable and open to chance; its sequences never repeat, progressing over a time frame that approaches eternity.

Simon describes creating his software.

602

Sol LeWitt
b. 1928; Hartford, CT
d. 2007; New York, NY

Five Towers, 1986
Basswood with alkyd enamel paint

Whitney Museum of American Art, New York; purchase with funds from the Louis and Bessie Adler Foundation Inc., Seymour M. Klein, President, the John I. H. Baur Purchase Fund, the Grace Belt Endowed Purchase Fund, The Sondra and Charles Gilman Jr. Foundation Inc., The List Purchase Fund, and the Painting and Sculpture Committee 88.7a–h

Donald Judd
b. 1928; Excelsior Springs, MO
d. 1994; New York, NY

Untitled, 1965
Aluminum with nitrocellulose lacquer

Whitney Museum of American Art, New York; purchase with funds from the Howard and Jean Lipman Foundation, Inc. 66.53

This work was conserved with funds from the Whitney Conservation Fellows

Donald Judd's *Untitled* is a sequence of solids and voids that appears irregular but was conceived with mathematical exactitude. Beneath the solid horizontal form, the ten metal rectangles and the intervals between them progress following a predetermined system of proportions. Progressing from the left, the lengths of the individual rectangles are matched by the interval between boxes on the right. In the center of the work the lengths and intervals are exactly the same. *Untitled* presents a rich interplay of surface, mass, color, negative space, and shadow—a complexity that seems to refute the reductive Minimalism with which Judd's work is routinely identified, pointing to the potential for combination inherent to the rule that the artist set up for the piece.

Hear about the reference to Harley-Davidson paint in the conservation treatment of this work.

▷ 603

Sol LeWitt
b. 1928; Hartford, CT
d. 2007; New York, NY

4th wall: 24 lines from the center, 12 lines from the midpoint of each of the sides, 12 lines from each corner, 1976
From *Wall Drawing #289*
Wax crayon, graphite pencil, and paint on wall

Whitney Museum of American Art, New York; purchase with funds from the Gilman Foundation, Inc. 78.1.4

Encapsulating the artist's idea that "the idea or concept is the most important aspect of the work," Sol LeWitt's wall drawings are actually sets of instructions that others execute when the work is to be exhibited. *Wall Drawing #289*, when implemented fully, covers four walls, of which only the fourth is on view here—a possibility LeWitt left open and that speaks to the work's adaptability. The exact angle and length of the lines here—twenty-four from the center, twelve from the midpoint of each of the sides, and twelve from each corner—are determined by those who draw them, and the work may be adapted to fit a variety of architectural contexts. Consequently, the wall drawing is scalable and can differ significantly with each realization. Although it is executed by a human rather than a computer, its language-based instructions function as a program would in a digital work of art.

Casey Reas
b. 1972; Troy, OH

{Software} Structure #003 A, 2004 and 2016
JavaScript

{Software} Structure #003 B, 2004 and 2016
JavaScript

Commissioned by the Whitney Museum of American Art for its *artport* website
AP.2004.5

In these works, Casey Reas responds to Sol LeWitt's concept that the idea is "a machine that makes art" by demonstrating that it is always true for works of software art. Reas generates and executes the drawing through programming, but, as with LeWitt's early wall drawings, starts with a description in natural language:

> A surface filled with one hundred medium to small circles. Each circle has a different size and direction, but moves at the same slow rate. Display:
>
> A. The instantaneous intersections of the circles
>
> B. The aggregate intersections of the circles

In *Structure #003A*, the points moving on the screen are the center of each circle, while the lines connect the intersections of overlapping circles. *Structure #003B* gives viewers a different view of the structure by compressing changes over time into the same visual space; it is created using a process similar to taking a long-exposure photograph of *Structure #003A* and is continually changing, erasing, and redrawing while never repeating.

Reas describes responding to Sol LeWitt using software.

611

Frederick Hammersley
b. 1919; Salt Lake City, UT
d. 2009; Albuquerque, NM

Selections from artist's untitled book, 1969
Computer-generated drawings on paper

Whitney Museum of American Art, New York; gift of the Frederick Hammersley Foundation 2016.177

In 1968, Frederick Hammersley began using the University of New Mexico's IBM mainframe computer to make images through an iterative process (repeated cycles of variations). He created these drawings using the computer program ART I, which was written in the programming language FORTRAN IV. The drawings use the 26 letters of the English alphabet and the 10 Arabic numerals along with 11 symbols within a working area 50 characters tall and 105 characters wide. The works demonstrate the connections between natural and programming languages by making the alphabet itself the material for generating visual patterns.

Joan Truckenbrod
b. 1945; Greensboro, NC

Curvilinear Perspective, 1979
Heat-transfer print on fabric

Whitney Museum of American Art, New York; purchase with funds from the Digital Art Committee 2018.48

To make her patchwork textiles, Joan Truckenbrod implemented algorithms depicting natural phenomena in the programming language BASIC to create a series of abstract sequential images. She then turned the monitor of the computer, an Apple IIe, upside down on a 3M Color-in-Color copier and printed the images on heat-transfer material. After superimposing a curved pattern and reconfiguring the image components, she hand-ironed them onto polyester fiber to create the composition. The textile work is shown suspended so that its display becomes fluid—affected by light and air movement—and part of the "natural" world. Truckenbrod's digital fabrics connect early computational art with the feminist textile art practice of the 1970s that challenged the relegation of techniques such as quilting, sewing, and weaving to the realm of "women's crafts."

Coded Algorithmic Drawing (#12), 1975
Computer-generated drawing: ink on paper

Coded Algorithmic Drawing (#40), 1975
Computer-generated drawing: ink on paper

Whitney Museum of American Art, New York; purchase with funds from the Digital Art Committee 2018.50, 2018.51

Joan Truckenbrod started making her computer drawings in the 1970s, using the programming language Fortran. She explains, "I saw that algorithms could be reconfigured, they were not a hard set of instructions but fluid, allowing me to transform ideas into new forms. There was a spontaneity that was related to this process, that then related back into the series of works." Truckenbrod would frequently incorporate algorithms that described natural phenomena, such as light or sound waves, and give them physical substance through her projects. Unlike today, artists working on computer drawings at that time could not see the results of their code on a screen immediately after having written it. They had to work with a machine to punch their program onto a series of cards, which then communicated with the mainframe computer that guided plotters to draw the work.

The artist discusses algorithms and nature in her work.

610

ROTATION

Joan Truckenbrod
b. 1945; Greensboro, NC

Curvilinear Perspective, 1979
Heat-transfer print on fabric

Whitney Museum of American Art, New York; purchase with funds from the Digital Art Committee 2018.48

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Coded Algorithmic Drawing (#45), 1975
Computer-generated drawing: ink on paper

Coded Algorithmic Drawing (#9), 1975
Computer-generated drawing: ink on paper

Whitney Museum of American Art, New York; purchase with funds from the Digital Art Committee 2018.52, 2018.49

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The artist discusses algorithms and nature in her work.

610

Charles Csuri
b. 1922; Grant Town, WV

Sine Curve Man, 1967
Ink on paper, output from drum plotter

Whitney Museum of American Art, New York; purchase with funds from the Digital Art Committee 2018.33

In 1967, Charles "Chuck" Csuri's *Sine Curve Man*, created at Ohio State University in collaboration with programmer James Shaffer, stood out as one of the most complex figurative computer-generated images. As Csuri and Shaffer explained, to make the work, "a picture of a man was placed in the memory of an IBM 7094. Mathematical strategies were then applied to the original data." Csuri and Shaffer's code transformed the line drawing of the man by repeatedly vertically shifting an X or Y value of the given curve and letting the resulting drawings accumulate on top of each other. Csuri felt that peer artists working with technology at the time had tended to place more emphasis on materials and technical processes than the underlying scientific concepts creating those products. For Csuri, the computer brought the artist closer to the scientist, allowing him to directly work with basic scientific concepts and examine the laws creating physical reality.

Mika Tajima
b. 1975; Los Angeles, CA

Negative Entropy, Vol. 5, 2015
Book of punched cards and digital spectrogram prints, with plastic-coil binding

Whitney Museum of American Art, New York; Frances Mulhall Achilles Library, Special Collections

Negative Entropy is a series of abstract "portraits" by Mika Tajima that draws connections between weaving and the history of computing. Her subjects are sites of computer data centers that provide the framework for the information economy and factories that employ industrial Jacquard weaving looms—invented by Joseph Marie Jacquard in 1804—that, like early computing, used punched cards for information storing. The portrait shown here is that of the New York University Central Data Center, the global hub and infrastructure for the university's information technology. The distribution of photography of the center is prohibited so the site is represented here as a Jacquard punched card that was translated from a digital photo taken of the site. Tajima also made audio recordings at the data center; she then used linguistic audio software to translate the sound frequencies into what is known as a digital spectrogram image, which is shown here interleaved with the punched card. The portrait both represents the data center and is a physical record of the data creating this representation.

Lillian Schwartz
b. 1927; Cincinnati, OH

Enigma, 1972
16mm film transferred to video, color, sound; 4:20 min.

Newtonian I, 1978
16mm film transferred to video, color, sound; 4 min.

Newtonian II, 1978
16mm film transferred to video, color, sound; 5:30 min.

Collection of the artist

Lillian Schwartz made these pioneering computer-generated films at AT&T Bell Laboratories, where she was artist-in-residence from 1969 to 2002. To create *Enigma*, Schwartz used EXPLOR, a programming macro language (a program that specifies an output sequence based on a defined input) written in Fortran that divides the screen into a grid of pixels and generates images as patterns of dots that form in randomly generated areas. The film rapidly shifts between black and white rectangular forms, creating the perception of strobing color. In the second half, Schwartz hand-colored the film to explore chromatic interactions. In *Newtonian I* and *Newtonian II* she draws upon mathematical systems to create the illusion of three-dimensional images. Schwartz was interested in the unpredictability of the macro language systems used to create these films, which generated unexpected forms by randomly selecting the areas and shapes into which they would grow.

632 Access

633 Access

634 Access

Please be warned, the video projection of this work creates a flashing light effect and should be avoided by people who have epilepsy or are sensitive to rapid light changes.

On wall:
Lucinda Childs (b. 1940), Philip Glass (b. 1937), and Sol LeWitt (1928–2007)

Dance, 1979 and 2014
Video, color, sound; 58 min.

Courtesy Daphnie-Production, Lucinda Childs, Philip Glass, and Marie-Hélène Rebois
Filmed by Marie-Hélène Rebois (b. 1949; Nancy, France)

613 Access

On floor, projection of:
Lucinda Childs
b. 1940; New York, NY

Dance #1–#5, 1979
Fiber-tipped pen or fiber-tipped pen and graphite pencil on paper

Whitney Museum of American Art, New York; gift of the artist 2009.156–2009.160

In vitrine:
Philip Glass
b. 1937; Baltimore, MD

Score for Dance #1, 1979
Photocopy with ballpoint pen

Whitney Museum of American Art, New York; gift of Lucinda Childs 2009.161

In 1979, choreographer Lucinda Childs collaborated with artist Sol LeWitt and composer Philip Glass to create *Dance*. Childs, whose works are characterized by the repetitious precise movements of her dancers, choreographed the five-part dance to a score written by Glass. Her drawings, here projected on the floor, map out the movement of the dancers and are colored according to the lighting design for each part. When the dance is performed, as in the video shown here, LeWitt's 35mm black-and-white film of Childs's choreographies is projected onto a scrim, overlaying the live dancers with a grid traversed by their filmed counterparts. The project reveals the commonalities in the serial and rule-based approaches each artist explored in different disciplines.

Sol LeWitt
b. 1928; Hartford, CT
d. 2007; New York, NY

Lucinda Childs
b. 1940; New York, NY

Dance #4, 1979
Graphite pencil, pen and ink, and tape on paper mounted to board, with wax crayon and collage on plastic overlay

Whitney Museum of American Art, New York; gift of Lucinda Childs
2009.155a–b

Casey Reas
b. 1972; Troy, OH

Sol LeWitt Wall Drawing #358, 2004 and 2016
From the series *{Software} Structures*
JavaScript

Commissioned by the Whitney Museum of American Art for its *artport* website
AP.2004.5

Casey Reas's *Sol LeWitt Wall Drawing #358*, part of his *{Software} Structures* series, is a software modification of a 1981 work by LeWitt that is not in this exhibition but was inspired by LeWitt's collaboration with Lucinda Childs and Philip Glass on *Dance* (1979), on view nearby. Reas's program updates itself four times per second, displaying a randomly selected composition of arcs. The arc, which features prominently in *Dance*, also dominates LeWitt's *Wall Drawing #358* and becomes a formal connection between Childs, Reas, and LeWitt.

From left to right:
Tauba Auerbach
b. 1981; San Francisco, CA

Binary Uppercase/Lowercase, 2005
Ink, opaque watercolor, and graphite pencil on paper

Whitney Museum of American Art, New York; purchase with funds from the Drawing Committee 2010.79

Tauba Auerbach's *Binary Uppercase/Lowercase* is part of a larger project in which the artist investigated the lack of ambiguity implicit in the digital language of binary code. Binary is used to encode computing and telecommunications data, and employs the digits 0 and 1 to represent text or instructions. To make this work, Auerbach translated the English alphabet into binary, spelled in uppercase on the left side and lowercase on the right side with black squares representing 1 and white squares standing in for 0. In so doing, Auerbach explores how the computing language reduces information to a two-symbol system using black-and-white categories to convey nuanced or complex information.

Hear about the alphabet Tauba Auerbach used here.

612

Agnes Denes
b. 1931; Budapest, Hungary

Dialectic Triangulation: A Visual Philosophy, series #3, 1970
Architectural photoreproduction

Whitney Museum of American Art, New York; gift of Virginia Dwan 70.1580

Charles Gaines
b. 1944; Charleston, SC

Walnut Tree Orchard: M1, M2, M3, 1977
Three parts: gelatin silver print (reprinted 2018); pen and ink and graphite pencil on paper; and pen and ink and correction fluid on paper

Whitney Museum of American Art, New York; Jack E. Chachkes Bequest 95.133a–c

Alex Dodge
b. 1977; Denver, CO

Human-Assisted Simulations of a Universal Will to Become (Simulation 9), 2014
Graphite, watercolor, and computer-guided cut stencil on plastic

Whitney Museum of American Art, New York; purchase with funds from Joshua Mack 2016.27

Alex Dodge regards code as "a tool for understanding the world within a logical and abstract framework," and he uses it to generate the visuals for his work. He considers his drawings investigations into complexity that model how intricate interconnected forms can be generated from seemingly basic parts. Here his work presents the possibility for infinite variation in the expression of shapes and in an ongoing pattern that builds upon itself. Dodge is particularly interested in how the digital/ephemeral and the physical/material—in this case graphite and watercolor—intersect in an artifact. His drawing underscores the power of code as a logic that allows forms to emerge and realize themselves.

Alex Dodge
b. 1977; Denver, CO

Functional Models of Self Realization (sammai-gumi) 6, 2014
Graphite, watercolor, and computer-guided cut stencil on plastic

Whitney Museum of American Art, New York; purchase with funds from Joshua Mack 2016.28

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ROTATION

Cheyney Thompson
b. 1975; Baton Rouge, LA

Broken Volume (10 L), 2013
Concrete

Whitney Museum of American Art, New York; promised gift of Thea Westreich Wagner and Ethan Wagner P.2014.33

In his *Broken Volume* sculptures Cheyney Thompson arranges one-inch concrete cubes along a path prescribed by the Drunken Walk algorithm, a type of Random Walk algorithm used in fields ranging from computer science and biology to economics to describe a succession of random steps that maps possible variations of a phenomenon. The works in this series all share the same volume of concrete, ten liters (10 L). Since the algorithm places no constraint on the sculptural forms and does not acknowledge the material's structural limits, the forms may break under their own weight. In fact, in the process of installing this work, it broke and is now presented as two parts.

The *Broken Volume* series captures the tension between the immateriality of an algorithm and the physical forms it produces. In doing so, the series comments on the potentially precarious nature of the increasingly algorithmic design of our environment—from architecture to financial markets—in which rules define, encode, and clarify relationships between elements of our daily life.

Ian Cheng
b. 1984; Los Angeles, CA

Baby feat. Ikaria, 2013
Live simulation, sound, artificial intelligence service; infinite duration

Whitney Museum of American Art, New York; gift of Candy and Michael Barasch 2015.197

In *Baby feat. Ikaria*, Ian Cheng's software enables an audible conversation between three online chatbots whose voices animate a swirl of debris. Via Wi-Fi, the software queries three different customized chatbots from an online service so that they "talk" to each other. The debris exhibits a behavioral pattern, repeatedly coalescing and then disintegrating, sometimes appearing as an active agent, at other times as inert material, and often as an ambiguous hybrid. While the chatbots are programmed to have basic learning abilities and can continuously expand their dialogue, the "intelligence" of the bots is questionable. The visuals and behaviors of the floating debris capture an artificial intelligence that is lifelike yet mechanistic, reflecting the mix of nonhuman and human conversations that increasingly permeates our lives.

Cheng describes putting chatbots into conversation.

▷ 620

Lawrence Weiner
b. 1942; Bronx, NY

HERE THERE & EVERYWHERE, 1989
Language + the materials referred to

Whitney Museum of American Art, New York; purchase with funds from the Contemporary Painting and Sculpture Committee 94.136

Joseph Kosuth
b. 1945; Toledo, OH

Five Words in Green Neon, 1965
Neon

Whitney Museum of American Art, New York; purchase with funds from Leonard A. Lauder 93.42a–b

W. Bradford Paley
b. 1958; Detroit, MI

Code Profiles, 2002 and 2018
Java applet

Commissioned by the Whitney Museum of American Art for its *artport* website AP.2002.11

Code Profiles looks at the computer program as text and visually comments on how code is read by people, written by programmers, and executed by computers. Reflecting on its own construction, the work consists of the code that makes the code visible on the screen. Three points in code space are indicated: the amber line follows the fixation point, tracing how people might read the text, line by line; the white line follows the insertion point and flows like the programmer's thoughts, calmly in one place then jumping around to make other parts of the code perform; and the green line moves along the execution point of the program, creating wide swaths where the code was executed thousands of times and appearing as a thin thread where the processor rarely visited. W. Bradford Paley thereby foregrounds the conceptual nature of all digital art, which is always driven by a language formulating instructions.

Nam June Paik
b. 1932; Seoul, Korea
d. 2006; Miami Beach, FL

Fin de Siècle II, 1989
Seven-channel video installation (partially restored), 207 televisions, sound

Whitney Museum of American Art, New York; gift of Laila and Thurston Twigg-Smith 93.139

To create the monumental *Fin de Siècle II*, Nam June Paik edited and reconfigured sequences from previously broadcast television programs and art videos, drawing out formal commonalities and patterns in seemingly disparate images. He thus liberates the moving images, which include close-up footage of David Bowie's face and choreography performed by both a human dancer and the schematic outline of one, from their original contexts. Paik used televised programs as his medium but also programmed the work itself to arrange the image sequences in a predetermined composition. *Fin de Siècle II* reflects how programming saturates and shapes our world, both through media content and through the underlying technological mechanisms that structure and transmit such content.

Paik made this work for *Image World: Art and Media Culture*, a 1989 Whitney Museum exhibition. Restored with partial replacement of its televisions and processor, *Fin de Siècle II* is presented here at full scale for the first time since then.

604 Access

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MMG description TK

▷ 604 ▷ 604 Access

Steina
b. 1940; Reykjavík, Iceland

Mynd, 2000
Six-channel video installation, color, sound; 16:38 min.

Whitney Museum of American Art, New York; purchase with funds from the Director's Discretionary Fund and the Contemporary Painting and Sculpture Committee in memory of M. Anthony Fisher and Anne Fisher 2003.307

To create this immersive video installation, Steina used Image/ine, a video-editing software for Macintosh computers that she co-developed in 1996 to process video footage in real time. Unlike other video-editing programs, Image/ine allows for the immediate manipulation of source material. For this work, Steina's base footage includes Icelandic landscapes, horses grazing, and images of the Atlantic Ocean. The programming language's "time-warp" function edits the source material as horizontal or vertical lines traveling through the frame, while the "slit-scan" function freezes a single line in the frame, capturing it as a stream of running images. Here, the two different kinds of processing appear projected next to each other, juxtaposing the two different processes of image manipulation.

Steina describes the technique and imagery in *Mynd*.

630 630 Access

Barbara Lattanzi
b. 1950; Evansville, IL

C-Span Alphaville and *C-SPAN Karaoke*, 2005
From the series *C-SPAN x 4*
Video documentation of real-time software (RealPlayer, Shockwave, QuickTime)

Commissioned by the Whitney Museum of American Art for its *artport* website
AP.2005.1

Barbara Lattanzi created *C-SPAN x 4* as a series of four online software tools that allowed visitors to the website of the Cable-Satellite Public Affairs Network (C-SPAN) to select video clips and manipulate and remix them. Since the original software is not functional anymore, two of the tools—*C-SPAN Karaoke* and *C-SPAN Alphaville*—are documented here through screen captures. In *C-SPAN Alphaville*, the video clips are subtitled with dialogue from the English-language version of Jean-Luc Godard's 1965 film *Alphaville*, in which a dystopian society is controlled by a central computer. *C-SPAN Karaoke* overlays prerecorded tracks from a karaoke machine onto selected videos, inviting people to sing along. Although humorous, these annotations nonetheless raise serious questions about authority and projections of state power within the online media environment.

660 Access

661 Access

Siebren Versteeg
b. 1971; New Haven, CT

New York Double Hung, 2008
Digital collage, output from internet-connected computer program with two touchscreens

Whitney Museum of American Art, New York; gift of Robert D. Bielecki
2017.241

New York Double Hung is a diptych of horizontal touchscreens—which visitors are invited to operate—that shows an ever-changing collage of images compiled from a combination of internet sources. The collage is always larger than the frame of the screen, and the areas extending beyond the frame are updated and revised continuously with new information. By touching the screen and dragging the collage, in the same way one might drag an image on Google maps, the viewer can bring the newly created sections into view but other areas are simultaneously being redrawn. Siebren Versteeg's programming "hand" is a persistent presence working just outside of what is visible, thereby pointing to the algorithms driving the internet beyond the small window of information we encounter on our screens.

Please swipe the touchscreen to experience the work.

Nam June Paik
b. 1932; Seoul, Korea
d. 2006; Miami Beach, FL

Magnet TV, 1965
Modified black-and-white television with magnet

Whitney Museum of American Art, New York; purchase with funds from Dieter Rosenkranz 86.60a–b

Magnet TV is an early example of Nam June Paik's "prepared televisions," works in which he altered the television's image or its physical casing. This work consists of a seventeen-inch, black-and-white set with an industrial-size magnet resting on top of it. The magnetic field interferes with the television's reception of electronic signals, distorting the picture into an abstract form that changes when the magnet is moved. Paik's radical action undermines the seemingly inviolable power of broadcast television by transforming the TV set into a sculpture, one whose moving image is created by chance and can be manipulated at will. Through his alteration of the television image, Paik challenged the notion of the art object as a self-contained entity and established a process of instant feedback, whereby the viewer's actions have a direct effect on the form and meaning of the work.

Earl Reiback
b. 1931; Brooklyn, NY
d. 2006; New York, NY

Thrust, 1969
Modified television

Whitney Museum of American Art, New York; purchase with funds from David Berman and Barbara Wise 94.132

To make the works in his series of modified televisions, Earl Reiback detached and emptied the cathode-ray tube (CRT) monitor of a TV, scraped the light-emitting phosphorus from the inside of the screen, then inserted sculptural elements and added back the phosphorescent paint. The altered televisions become sculptural forms, drawing attention to the space of the monitor and the creation of images through electronic signals, and also playing with our perception of how images are projected.

ROTATION

Earl Reiback
b. 1931; Brooklyn, NY
d. 2006; New York, NY

Suspension, 1969
Modified television

Whitney Museum of American Art, New York; purchase with funds from David Berman and Barbara Wise 94.131

To make the works in his series of modified televisions, Earl Reiback detached and emptied the cathode-ray tube (CRT) monitor of a TV, scraped the light-emitting phosphorus from the inside of the screen, then inserted sculptural elements and added back the phosphorescent paint. The altered televisions become sculptural forms, drawing attention to the space of the monitor and the creation of images through electronic signals, and also playing with our perception of how images are projected.

ROTATION

Cory Arcangel
b. 1978; Buffalo, NY

Super Mario Clouds, 2002
Handmade hacked *Super Mario Brothers* cartridge and Nintendo NES video-game system

Whitney Museum of American Art, New York; purchase with funds from the Painting and Sculpture Committee 2005.10

For this video installation, Cory Arcangel "hacked" a cartridge of *Super Mario Brothers*, the original version of the blockbuster Nintendo video game released in the United States in 1985. By altering the game's code, the artist erased the sound and all of the visual elements except the iconic scrolling clouds. On a formal level, the project recalls paintings that push representation toward abstraction: how many elements can be removed before the ability to discern the source is lost? Arcangel, who was trained in classical music, considers computers and video-game consoles his instruments, and he insists on mastering them prior to creative exploration; he will often learn a new programming language in order to develop a work. What might be viewed as nostalgia for the popular entertainments of an earlier era depends, in fact, on a rigorous conceptual approach to computer hard- and software.

Arcangel discusses working with a video-game console.

631

Jim Campbell
b. 1956; Chicago, IL

Ambiguous Icon #5 (Running, Falling), 2000
LED lights and custom electronics

Whitney Museum of American Art, New York; purchase with funds from the Contemporary Painting and Sculpture Committee 2001.128

Reconstruction 7, 2006
LED lights and cast-resin screen

Whitney Museum of American Art, New York; gift of Robert D. Bielecki 2017.238

Jim Campbell's series of "low-resolution" works explores the construction of the electronic and digital image by breaking it down into units of light. In *Ambiguous Icon #5 (Running, Falling)*, a matrix of pixels made of red LEDs (light-emitting diodes) with hundreds of possible light values shows a figure running and falling in a loop. In *Reconstruction 7*, a resin diffusion screen is mounted in front of an array of LED pixels showing a traffic scene. The resin block softens the highly pixelated depiction produced by the LEDs, creating a decipherable image. Through the programming of custom electronics, Campbell draws attention to the thresholds of legibility for images made and viewed through a matrix of signals.

Campbell discusses his use of low-resolution images.

650

Jim Campbell
b. 1956; Chicago, IL

Tilted Plane, 2011
Custom LED light bulbs and electronics

Whitney Museum of American Art, New York; gift of The Lipman Family Foundation, Inc. 2012.22a–f

Tilted Plane, part of Jim Campbell's *Exploded View* series, expands a two-dimensional moving image into three-dimensional space. Campbell handcrafted hundreds of hanging LEDs from standard 100-watt light bulbs by removing the glass filament from each and replacing it with a custom-made LED stem designed to perfectly fit the bulb envelope. Connected to a circuit board with custom electronics, the light bulbs function as an array of pixels and a tilted, low-resolution video display. When viewed from the front of the installation, the flickering LEDs register as birds taking off and landing. As one moves closer or off-axis, the flickering becomes abstract and seemingly random. With *Tilted Plane* Campbell takes his earlier experiments with resolution from the screen into a room.

No photography inside the installation.

Please do not touch.

Jonah Brucker-Cohen
b. 1975; Washington, DC

Katherine Moriwaki
b. 1975; Torrance, CA

America's Got No Talent, 2012 and 2018
Java app

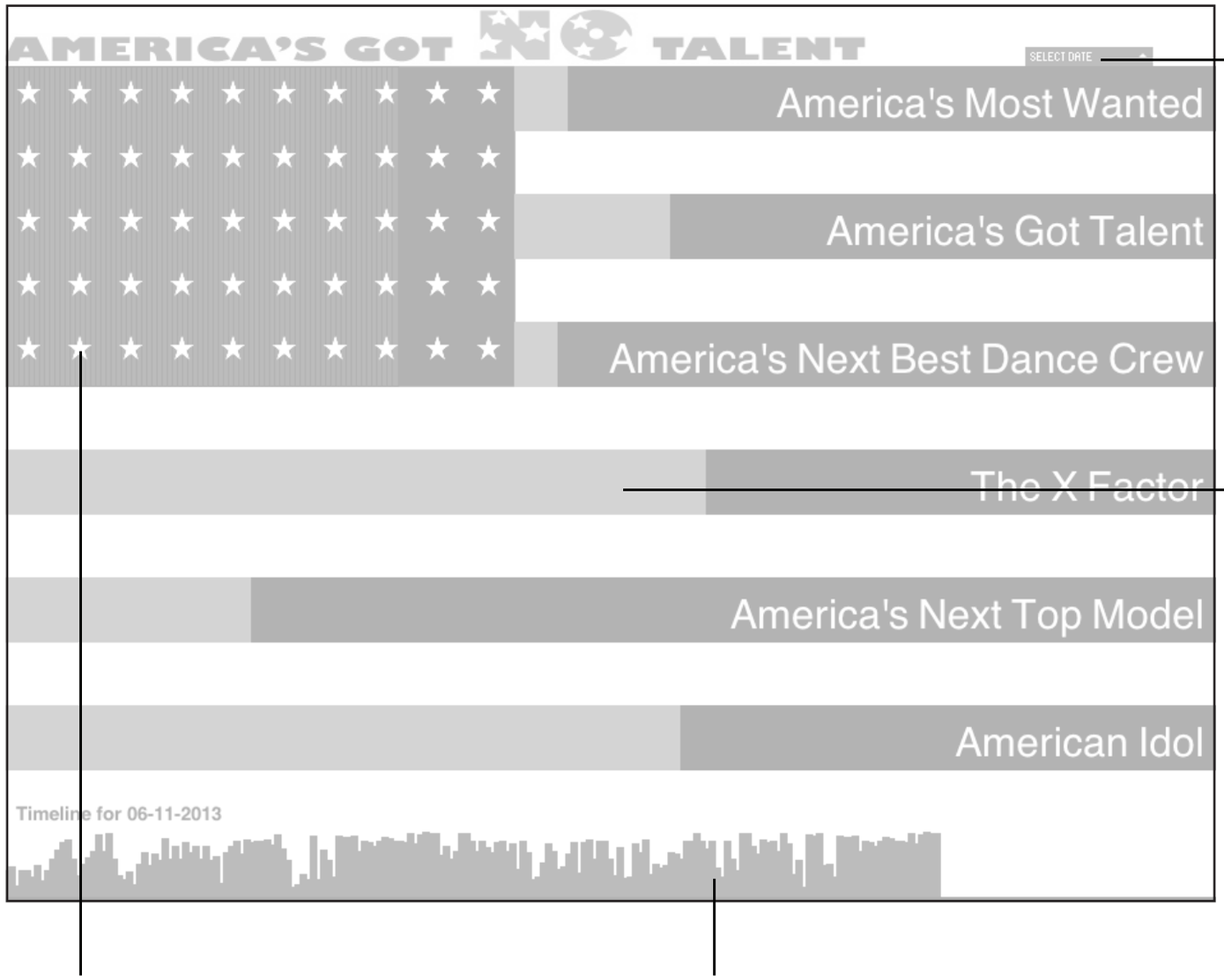
Commissioned by the Whitney Museum of American Art for its *artport* website
AP.2012.1

America's Got No Talent is a data visualization that chronicles Twitter feeds related to reality-television shows such as *American Idol*, *America's Got Talent*, and *America's Best Dance Crew* over the course of a few years. Jonah Brucker-Cohen and Katherine Moriwaki's project highlights how the shows gain notoriety through social media: it displays when tweets were sent and how much bias was gathered for each program based on retweets from the fans and followers of the shows. Using a horizontal bar graph in the shape of an American flag as an interface for navigation, the project creates a meter for measuring how the success of television shows is linked to their social media exposure. *America's Got No Talent* reveals how networked communication affects both TV programming and popular opinion.

The artists connect the internet and the culture of TV.

640

Please use the menu on the touchscreen to interact with the work.



Click on pulldown menu to select tweets from past dates.

Roll over stripes to browse tweets from specific shows.

Roll over stars to browse tweets containing the words “No Talent” and/or “America.”

Roll over timeline to browse all tweets on the selected day in chronological order.

Rules of the system:

- There are two camps—the French Authority (F-cell) and the National Liberation Front (A-cell).
- F-cells are dispatched intermittently. They mostly stay in the same spot and only move when engaged in raids, interrogations, and other mobilizations.
- A-cells emerge frequently and usually quickly submerge again. Sometimes they may linger a bit longer to recruit, forming a triangular organization.
- After a while, the number of cells accumulates. A-cell may reveal itself to ambush F-cell. F-cell may call for backup to counteract.
- Eventually further conflicts occur, and trigger even more excited cell movements.
- The intensity and speed may recess or aggravate according to the system status.
- If the action builds up to utter chaos, a cell cluster may become exhausted.

—Marc Lafia and Fang-Yu Lin

Mendi + Keith Obadike
Founded 1996; Nashville, TN

The Interaction of Coloreds, 2002 and 2018
HTML 5, JavaScript

Commissioned by the Whitney Museum of American Art for its *artport* website
AP.2002.7

The Interaction of Coloreds, part of Mendi + Keith Obadike's *Black Net.Art Actions*, engages with patterns of racial classification on the internet. The artists created the work at a time when online commercial ventures were positioning the internet as a space without prejudice, free from mediation through our physical appearance and therefore devoid of notions of race. Drawing attention to the fact that there still is a strong link between skin color and money in the filtering and tracking involved in online commerce, Mendi + Keith Obadike here create a satirical Color Check System. Billed as the world's first online skin-color verification system, their website enables the translation of skin tone—as captured in a photo or screenshot—into a six-digit, three-byte hexadecimal number used in HTML, the online scripting language, to represent color (#FFFFFF, for example, equals white). Using satire as strategy, the work strives to spur conversations about racial discrimination in internet commerce.

Please swipe the touchscreen to scroll through the work or touch the numbers to navigate pages.

The artists critique utopian ideals of online identity.

▷ 641

Please complete the questionnaire on this tablet.

Paul Pfeiffer
b. 1966; Honolulu, HI

Goethe's Message to the New Negroes, 2001
Video, color, silent; 0:39 min. looped; with color LCD monitor, metal armature, DVD player, and DVD

Whitney Museum of American Art, New York; purchase with funds from the Contemporary Painting and Sculpture Committee 2001.227

To create *Goethe's Message to the New Negroes*, Paul Pfeiffer digitally edited television footage of previously broadcast professional basketball games. His edits center the ball, which never appears in the video, making it an absent and static object around which the players circulate, and drawing attention to how mass media elicits the worship and fetishization of athletes. Intimate in scale while jutting out from the wall, the sculpture accommodates only one viewer at a time and demands to be viewed at close range.

Pfeiffer's works frequently examine the sociocultural structures that underlie television programming. In titling the work after an essay by Léopold Sédar Senghor—a member of the Négritude intellectual movement formed in 1930s Paris and a staunch critic of fascism and colonialism—Pfeiffer pays homage to the thinker's articulation of the dignity of Black identity, linking those notions to the players that appear in the work.

Pfeiffer describes his abstract approach to sports.

642

Rafaël Rozendaal
b. 1980; Amsterdam, Netherlands

Abstract Browsing 17 03 05 (Google), 2017
Weaving, output from rapier loom machine

Whitney Museum of American Art, New York; purchase with funds from the Director's Discretionary Fund and the Robert D. Bielecki Foundation 2018.55

Abstract Browsing 17 03 05 (Google) is a machine-woven tapestry depicting an abstract version of the Google browser's interface. To produce his *Abstract Browsing* series, Rafaël Rozendaal created a plug-in for Google's Chrome browser; available to anyone online, it reduces images and text on any website visited to colored rectangles. The artist surfs the web every day using his plug-in and compiles thousands of screenshots, which he then narrows down to a small selection to be produced as tapestries. The tapestries are created at the Textile Museum in Tilburg, the Netherlands, where Rozendaal's screenshots are converted into a file for output by a weaving machine. His project connects layers of machine abstraction: the initial transformation of the webpage exposes a composition optimized to grab our attention, while the tapestry references the roots of computing in nineteenth-century weaving machines that automated the creation of patterns.

Please do not touch.

Please do not touch.

Please do not touch.

Please do not touch.

Please do not touch.

James L. Seawright
b. 1936; Jackson, MS

Searcher, 1966
Metal, plastic, and electronic parts

Whitney Museum of American Art, New York; purchase with funds from the Howard and Jean Lipman Foundation, Inc. 66.137a–b

TAMIKO

Please pick up the tablet and look around.

Please pick up the tablet and look around.

Marc Lafia
b. 1955; Philadelphia, PA

Fang-Yu Lin
b. 1973; Taipei, Taiwan

The Battle of Algiers, 2006 and 2018
Mac app

Co-commissioned by the Whitney Museum of American Art and Tate Online
AP.2006.4

Marc Lafia and Fang-Yu Lin's *The Battle of Algiers* recomposes scenes from the 1965 film of the same name by Italian director Gillo Pontecorvo. The original film is a reenactment of the Algerian nationalist struggle that ultimately led to independence from France in 1962. The nationalists' success has been attributed to their organization: a pyramidal structure of self-organized cells. Lafia and Lin "rearranged" the film along a cell-based structure, in which French Authority and Algerian Nationalist cells are represented by stills from the film and move according to different rule sets. When cells of different camps intersect, they trigger video cells displaying each side's tactics (as depicted in the film) according to the rules of the system. *The Battle of Algiers* is literally programmed, but it also engages with cultural and political programs of colonialism, nationalism, and resistance.

Unexpected Growth

Tamiko Thiel's *Unexpected Growth* uses augmented reality (AR)—the overlay of virtual elements onto physical reality—to create a parallel dimension of organic growth for the adjacent outdoor gallery. The work can be experienced using one of the tablets mounted near the windows in this gallery or on your own iOS or Android mobile device; to download the app, scan the QR code below, search for "Unexpected Growth Tamiko Thiel" in your device's app store, or direct your device's browser to tamikothiel.com/ug.

Thiel's virtual growth consists of plastic refuse and coral-like formations, and offers a playful yet ominous glimpse of a future where sea levels have risen to dangerous levels and ecosystems are irreversibly contaminated. Over the course of each day visitors experiencing the work stimulate the corals' growth, but once the number of viewers exceeds a certain threshold the accumulated exposure bleaches the formations and causes them to die off. After a lengthy period of overnight rest, the growths are restored to their original vibrancy.

The algorithm used to create the forms of the corals is based on an L-system (or Lindenmayer system), a type of formal grammar developed in 1968 by the Hungarian biologist and botanist Aristid Lindenmayer to model the growth processes of plant development. Through this work, Thiel highlights the inherent connection between natural processes and the generative qualities of code and invites us to contemplate the ways in which we influence and shape the natural environment surrounding us.

Tamiko Thiel (with /p)
b. 1957; Oakland, CA
Unexpected Growth, 2018
Augmented reality app
Commissioned by the Whitney Museum of American Art