[Never Alone: Video Games and Other Interactive Design]

With their relentless pop-ups and alerts, our devices like to remind us that we spend a huge portion of our lives in the digital realm. All of our interactions there, whether in Zoom and WhatsApp or Discord and Minecraft, take place through interfaces: the visual and touchable elements that allow us to communicate with machines, apps, and entire infrastructures. Interfaces, like other everyday tools, are seldom recognized as design in their own right, but they are powerful examples of interactive design – the field that considers the points of contact between objects and people, and the ways in which this contact can shape our behavior.

Never Alone: Video Games and Other Interactive Design brings together notable works from this field, all drawn from MoMA's collection. In video games, the exhibition's focus, the interface is more than a means to an end; it is the conduit to the narrative and the experience as a whole – its ease, dynamic, and emotional resonance. They are organized in three selections highlighting critical aspects of gaming interaction – a game's input, its designer, and the players who bring it to life – through works that range from iconic global hits (such as Pac-Man) to encounters with the absurd (such as Everything Is Going to Be OK). These appear alongside examples of interactive design that have reshaped our world, some as simple as the universal @ sign and others as complex as a remote graffiti device.

This exhibition explores how interactive design transforms us, influences the way we experience our bodies, and changes our perception of space, time, and relationships. Above all, *Never Alone* emphasizes design's role in connecting us with one another and with the pulse of the world.

Power symbol (2002)
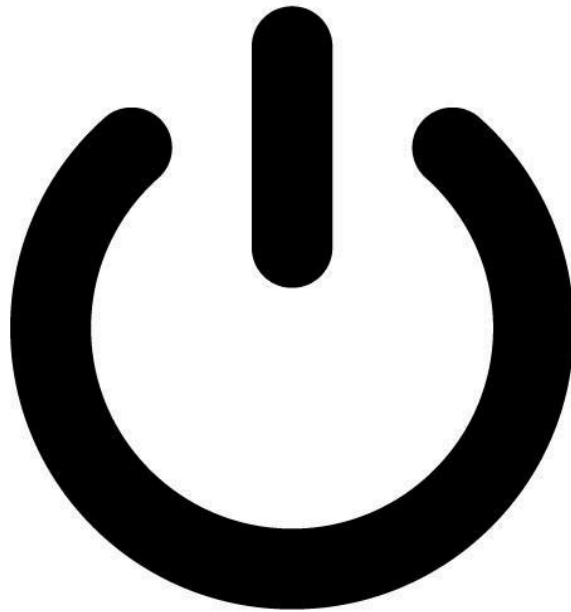
<mark>The earliest binary switches were marked with an I and an O to denote, respectively, a closed electrical circuit (device on) and an open circuit (device off). In 1973, these two symbols were combined into one now-familiar icon, initially referred to as a "standby setting."</mark> Thirty years later, an international committee of scientists and engineers undertook a research project, ultimately recommending in 2002 that this combined symbol should stand for its more commonly accepted understanding: "power."

iPod (2001)

At the time the iPod was born, Ive, the head of Apple's design group had been overhauling the company's hardware design with his team since 1997, using a new palette of materials characterized most prominently by translucent polycarbonate plastic. The iPod, a portable hard drive initially used exclusively as an MP3 player, introduced stainless steel into Apple's material repertoire.

The iPod exponentially expanded the typical capacity of a music device, and it did so within a physical framework that was significantly smaller, cleaner, and more intuitive than any similar player. The first-generation iPod features a mechanical scroll wheel, four navigational buttons along its circumference, and a black-and-white text screen. The iPod's data and its power supply are transferred through a USB cord to a computer or other power outlet, thus eliminating the need for any additional detachable parts besides the earphones.

The iPod substantially influenced the quality and elegance not only of portable music devices but of electronic products in general. It raised the public's expectations for all consumer products, thus stimulating manufacturers to incorporate design considerations at the highest levels of their corporate structures.

A feat of product and interface design, the iPod had a dramatic effect on the way people lived with technology. Coupled with its "mother ship" application, iTunes, the iPod launched a new way to buy, experience, and store music and audio entertainment, educational programs, information, and video.

XO Laptop from the One Laptop per Child (OLPC) project (2005)
Sugar Interface for the XO Laptop (2006-2007)
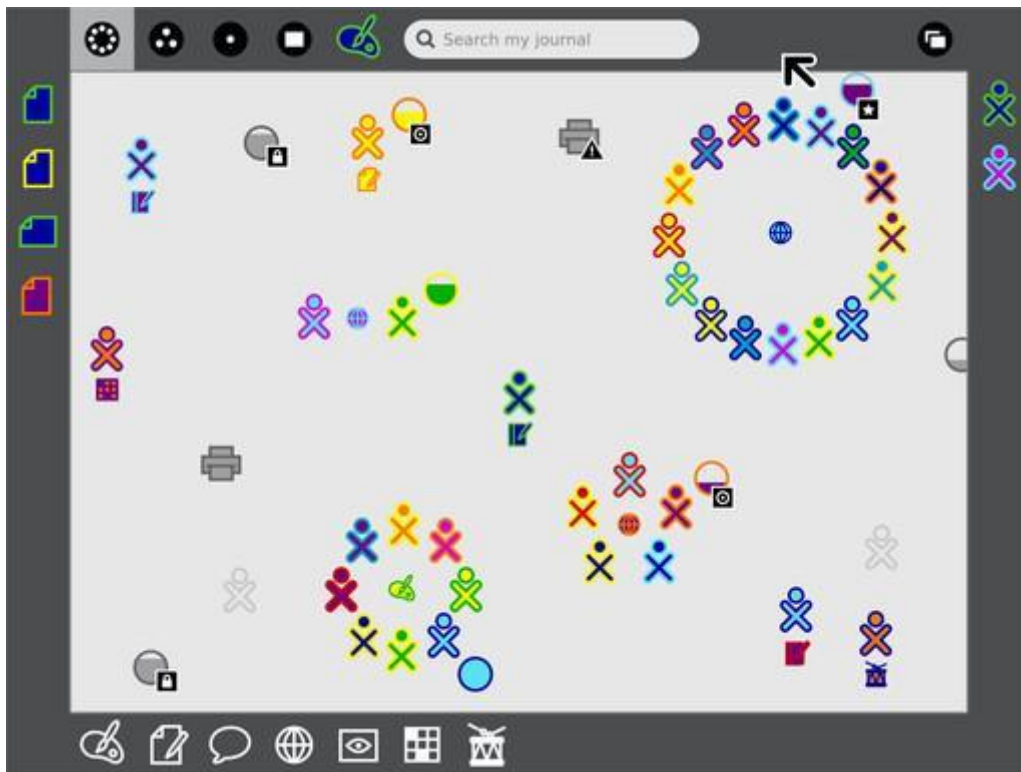
The XO Laptop is an inexpensive computer for children in the developing world. It was specifically adapted to the needs and habits of children: it is the size of a textbook and lighter than a lunch box,

with soft edges, a handle, and a rubber keyboard; it is recyclable, drop-proof, splash-proof, and dustproof; it can be manually recharged; and its wireless antennae resemble playful rabbit ears. More than seven hundred thousand of these laptops, many of them equipped with the innovative and child-friendly interface Sugar, have been distributed to schools in Argentina, Brazil, Cambodia, China, Ethiopia, Libya, Mexico, Mongolia, Nigeria, Pakistan, Paraguay, Peru, Romania, Rwanda, Thailand, and Uruguay. A newer model, XOXO, was developed with feedback from children and released in 2010.

Teams from Pentagram and Red Hat created this icon-driven interface in which collaboration is the core of the user experience. The laptop encourages social interaction, and most activities center on the creation of an object—a drawing, a song, a story, a game—and on "real-world metaphors" such as chatting, sharing, and gathering. All the laptops are connected to a wireless network, both to the web and to one another. The more laptops are connected, the more powerful the network becomes. "By exploiting this connectivity within the community, among people and their activities," the designers say, "One Laptop per Child makes use of what people already know in order to make connections to new knowledge."

Sugar was designed for One Laptop per Child, an ambitious plan to produce inexpensive laptops for schools in the Global South. The interface emphasizes community and ease of use, with bright, clear icons that show children their classmates' locations. Sugar is an early example of the participatory character of Web 2.0, from its focus on sharing and collaboration to its Linux-based open-source code. Despite its energy and vision, the program ultimately crashed and burned for reasons including hardware glitches, political quicksand, and the failure to grasp the real needs of its intended users.

The Input

Hands, for many of us, are the first and primary interface – the tools through which we encounter and shape our surroundings. For millennia, designers have been hard at work to conceive ways to translate our thoughts and intentions into objects, bringing them to life. The advent of the computer has made this task even more complex and vital.

Consider the button. This simple device translates physical input – the press of a fingertip – into signals, acting as a switch between physical and digital worlds. Advancements in computer technology have made this exchange increasingly lively, as well as more intricate – from the mouse to the keyboard to the touchscreen. The input device is itself an interface, which, when skillfully designed, engages mind, body, and machine in a rewarding conversation. Now, as we inch closer to seamless digital interactions throughout the physical world, external devices will become less necessary. And, one day, interfaces that directly connect brain to machine will bring about a vast field of new interactive experiences.

EyeWriter (2009)

TEMPT1, a Los Angeles-based graffiti artist and activist, was diagnosed with amyotrophic lateral sclerosis (ALS) in 2003, and the disease soon left him entirely paralyzed except for his eyes. The team that developed EyeWriter equipped a pair of eyeglasses with eye-tracking technology and custom software that could capture TEMPT1's eye movements. From his hospital room, wirelessly connected to a laptop and laser-tagging apparatus installed in downtown LA, the artist could draw his tag and have it projected on buildings at a superhuman scale in real time, so viewers could see the glowing graffiti as they were created. The EyeWriter research project was a collaboration among TEMPT1, the members of Free Art & Technology (FAT) lab, the openFrameworks community, and Graffiti Research Lab (GRL), with support from the Ebeling Group production company, the Not Impossible Foundation, and the Design and Technology program at Parsons The New School for Design, New York.

Eye Candy from the Sensory Plasticity project (2007)

Eye Candy is a series of prototypes that take advantage of the human brain's extraordinary plasticity – its potential to adapt to sensory input, substitute one sense for another, and use a variety of information sources to amplify our experience of the world. In this speculative project, electrodes on the surface of little sugar-coated capsules translate one sense into another by sending the taste input to the brain at a frequency that the brain interprets as visual information. This is then uploaded to a computer via USB, enabling us to see the sweet candy's flavor as vivid images.

Magnavox Odyssey (1972)
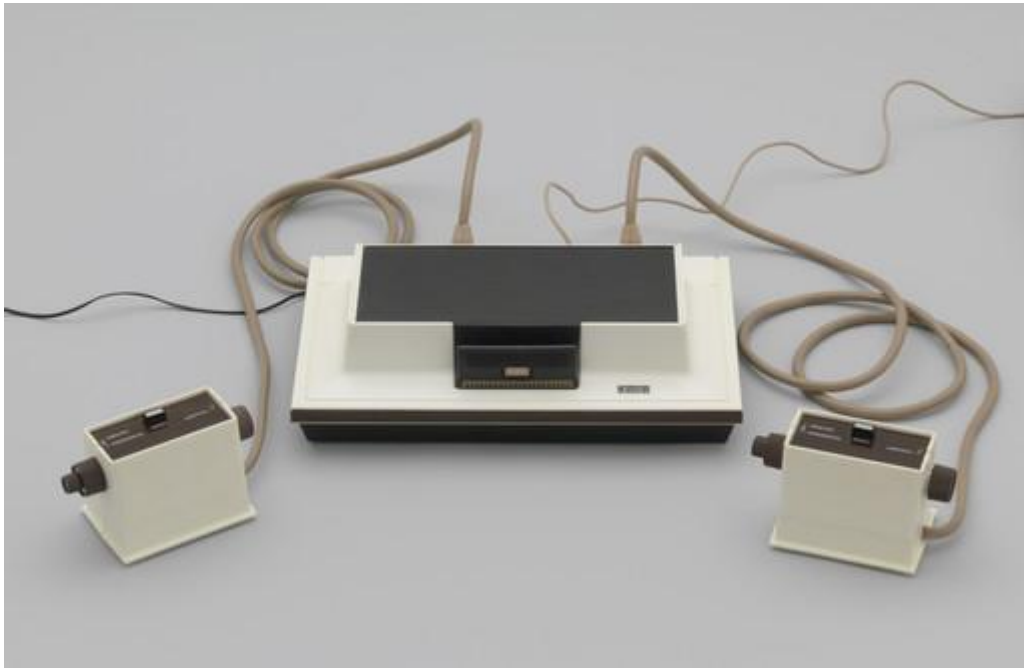
The Magnavox Odyssey is the first commercial home video game console. The hardware was designed by a small team led by Ralph H. Baer at Sanders Associates, while Magnavox completed development and released it in the United States in September 1972 and overseas the following year. The Odyssey consists of a white, black, and brown box that connects to a television set, and two rectangular controllers attached by wires. It is capable of displaying three square dots and one line of varying height on the screen in monochrome black and white, with differing behavior for the dots depending on the game played. Players place plastic overlays on the screen to display additional visual elements for each game, and one or two players for each game control their dots with the knobs and buttons on the controller by the rules given for the game. The console cannot generate audio or track scores. The Odyssey console came packaged with dice, paper money, and other board game paraphernalia to accompany the games, while a peripheral controller—the first video game light gun—was sold separately.

The idea for a video game console was conceived by Baer in August 1966. Over the next three years he, along with Bill Harrison and Bill Rusch, created seven successive prototype consoles. The seventh, known as the Brown Box, was shown to several manufacturers before Magnavox agreed to produce it in January 1971. After releasing the console through their dealerships, Magnavox sold 69,000 units in its first calendar year and 350,000 by the time the console was discontinued in 1975. The console spawned the Odyssey series of dedicated consoles as well as the 1978 Magnavox Odyssey 2. One of the 28 games made for the system, a ping-pong game, was an inspiration for Atari's successful 1972 *Pong* arcade game, in turn driving sales of the Odyssey. Patents by Baer and the other developers for the system and the games, including what was termed by a judge as "the pioneering patent of the video game art", formed the basis of a series of lawsuits spanning 20 years, earning Sanders and Magnavox over US$100 million. The release of the Odyssey marked the beginning of the first generation of video game consoles and was an early part of the rise of the commercial video game industry. (Wikipedia)

Hong Pong video game console (1976)

Pac-Man (1980)

Pac-Man is one the earliest examples of an interactive flat landscape—a maze, in this case—in a computer game. At the time of its genesis, the most popular arcade games were shooter games, like Space Invaders and Asteroids. Iwatani wanted to develop a nonviolent game for the teenage couples and groups that were beginning to frequent arcades in addition to boys. While eating pizza for lunch one day he had a vision of his character—a giant yellow circle with a wedge removed for a mouth. In creating the colorful ghosts that are Pac-Man's nemeses, Iwatani chose cuteness over scariness, hoping to appeal to female players. The player controls Pac-Man with a joystick, directing him to eat all of the dots in the maze while eluding the ghosts, who can end his life. If he succeeds, he moves up a level. Eating special power pellets gives Pac-Man the ability to attack the ghosts, and by eating transformed ghosts, assorted fruits, and other objects the player can gain bonus points. Eating to gain power, Iwatani has said, was a concept he borrowed from Popeye.

Tempest (1981)
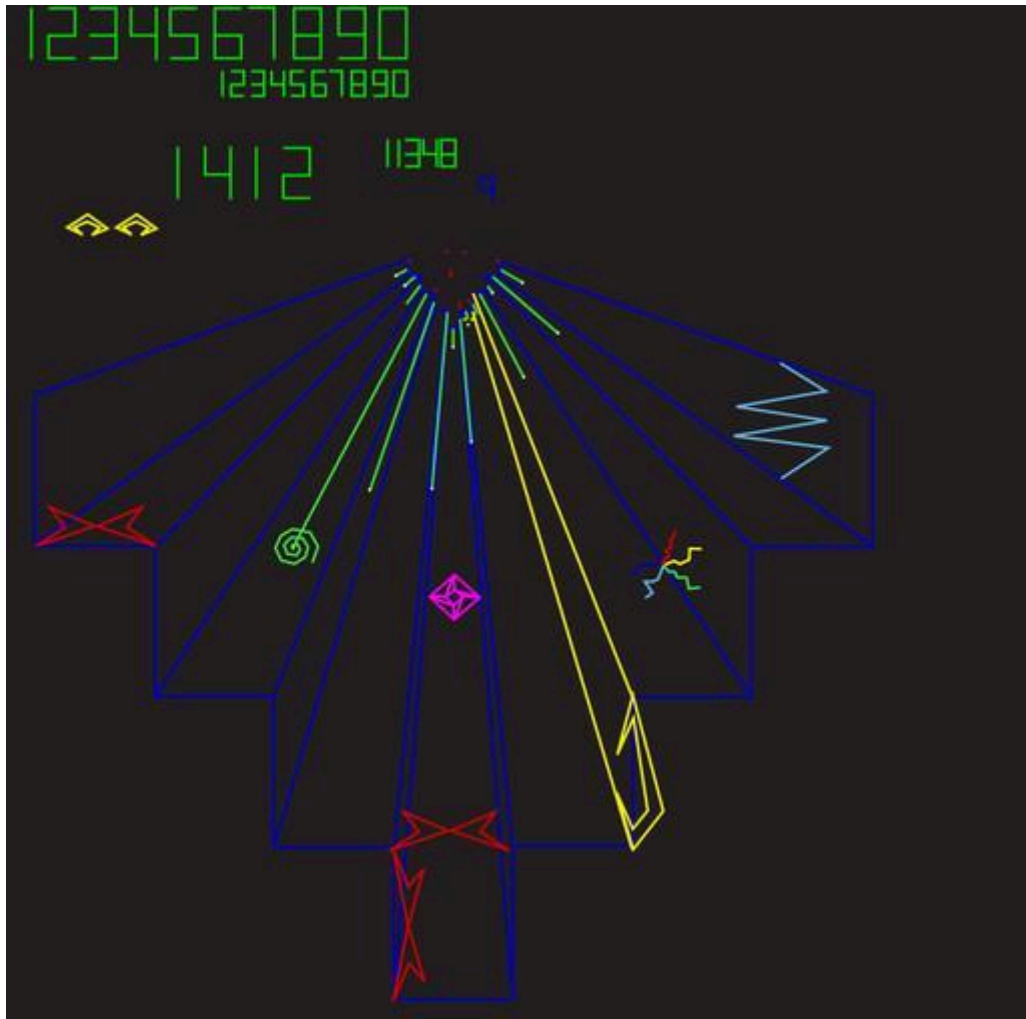
A childhood nightmare about monsters emerging from a hole in the ground inspired Theurer to <mark>bend the typical video-game playing space – the flat surface that corresponds to the screen – into a tube, so that players seem to be firing their blasters down a tunnel at alien creatures</mark>. Tempest was <mark>one of the first games designed in one-point perspective</mark>, in which objects are smaller the farther away they are, and <mark>one of the first to feature the higher-resolution color vector display</mark>, which renders graphics in lines rather than in pixels on a grid.

Katamari Damacy (2004)

Shortly after graduation from art school, Takahashi was hired as a designer at NAMCO BANDAI, where he was allowed to develop unconventional games. Critically acclaimed for its innovation and wit, Katamari Damacy (Clump soul) is simple, if unconventional: the player takes on the role of an extraterrestrial prince sent to Earth by the King of the Cosmos to gather balls of anything and everything—balls that, when sufficiently big, become new stars that populate the cosmos. The narrative, characters, and details are unique, but the player's task is not complex, limited to rolling clumps of debris—starting with erasers and bits of sushi and moving to cows and houses—into progressively larger spheres, until whole mountains and cities adhere. The game plays with scale, allowing the user to interact in a creative, surreal way with ordinary objects and built environments, rendering the objects of everyday life fantastical. The minimal narrative and repetitive activity yield surprise and elation, due to the quality of the graphics and the unexpected coherence of the "clump"—inexorable and playful as it eats up the whole world.

Monument Valley (2014)

Prayer Companion (2010)

The Prayer Companion alerts the nuns of the Poor Clare religious order in York, England, to issues that need their intercession. These nuns, whose everyday lives have changed little since medieval times, are an enclosed order, with only occasional and limited connection with only occasional and limited connection with the outside world. <mark>The Prayer Companion's unobtrusive dot-matrix screen displays an ongoing scroll of issues and situations to be included in the nuns' prayers, all sourced from news feeds, social networks, and blogs.</mark> The nuns have reported that the Prayer Companion "has been valuable in keeping [our] prayers pertinent."

John Maeda – The Reactive Square (1994)

Maeda's Reactive Books were <mark>among the first works to explore the expressive possibilities of interactive media</mark>. Each book presents a graphical response to a different input: the mouse (Flying Letters), time (12 o' clocks), the keyboard (Tap, Type, Write), and video (Mirror Mirror). The Reactive Square brings real-time motion to Kazimir Malevich's iconic Suprematist painting *Black Square* (1915): the stark, imposing shape of the original reacts to audio input with fluttering, shattering, and other movements.

The Player

Interfaces need users. No matter how elegant the code, how realistic the animations, or how witty the dialogue, a video game cannot play itself. The overall shape is dictated by its designer, but it is the performance of the player that brings the interactive experience to life and gives it meaning.

The richness and diversity of today's video games have been brought about, in part, by their dedicated and creative player communities. They resolve glitches, adjust the code, and inevitably exploit every weakness they can find in a game's structure. Like musicians tweaking chords and adapting rhythms, those who play, interpret, and redesign video games expand those games' boundaries, finding new ideas and possibilities within the designed interaction. The player and the designer are united in the creation of the experience, reminding us that when we play, we are never alone.

SimCity 2000 (1993)
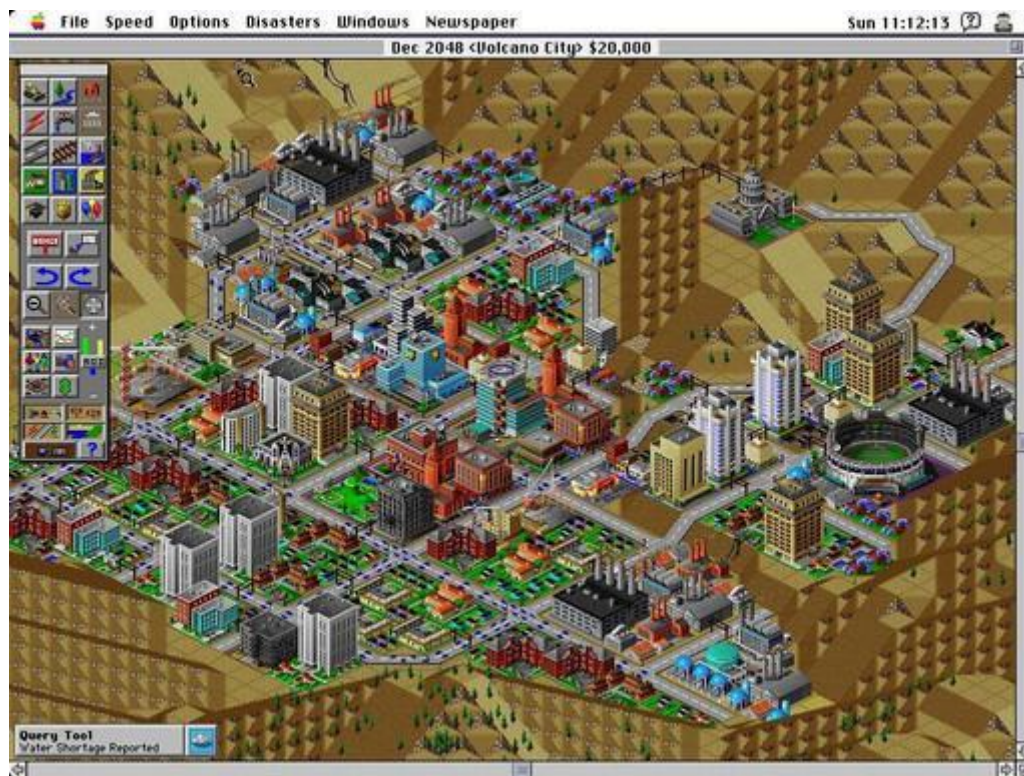
In SimCity 2000, the player is an all-powerful mayor-for-life attending to the myriad details of urban growth, such as zoning for residential, commercial, and industrial development; laying out roads and transportation systems; allocating budgets; keeping the lights on; and more. The traditional gaming narratives and systems of goals and rewards are eschewed in favor of what programmers call an open-ended digital sandbox, in which players pursue their own objectives and direct their own stories in a game of their own imagining.

Minecraft (2011)

Biophilia (2011)
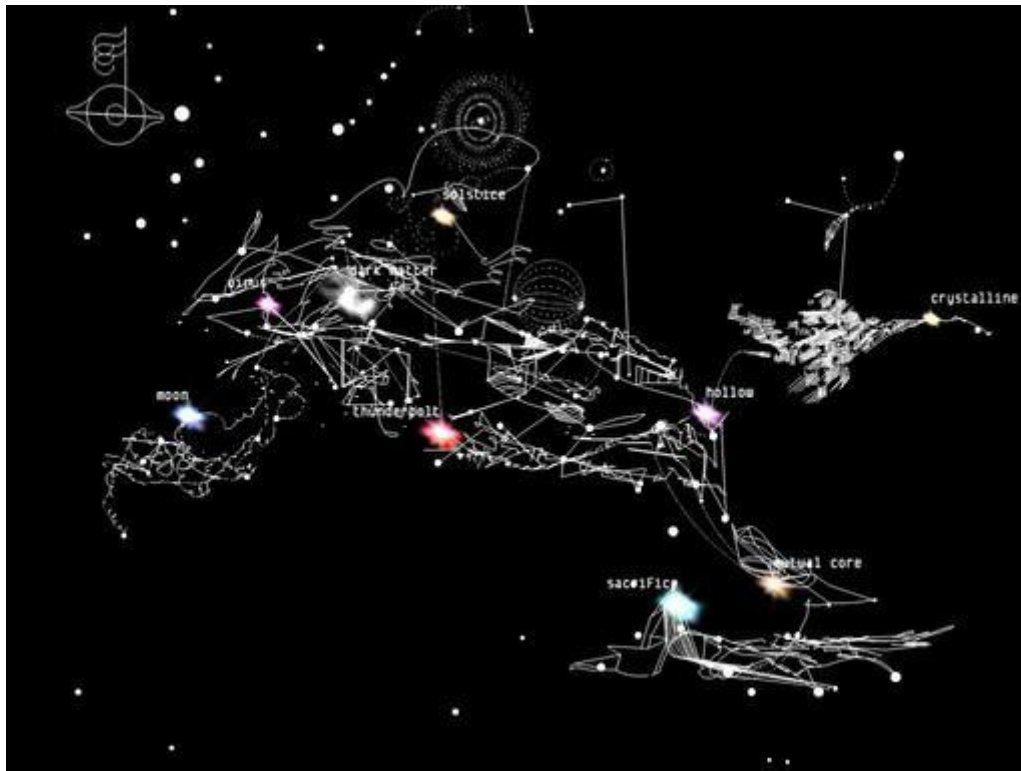
In 1984, the naturalist Edward O. Wilson argued that humans are biologically driven to seek connections with other life-forms. Wilson's concept, which he called "biophilia," inspired this app, which is simultaneously a music album, a collection of sixteen sound-and-video games, and an interactive performance. Players are invited to contribute to the work by manipulating the music that accompanies songs by the Icelandic musician Bjork. As a collaboration among artists, musicians, designers, programmers, and poets – as well as players – Biophilia demonstrates that seeking out interacting with each other is natural and expected.

Tweenbot (2009)

Tweenbots are small robots that depend on the kindness of strangers to get where they are going. Kinzer sent Tweenbot Sam on missions in Washington Square Park in New York City, armed only with a flag asking that it be pointed toward a particular destination. She expected that Sam would be crushed, lost, or thrown away, but, she observed, "every time the robot got caught under a park bench, ground futilely against a curb, or became trapped in a pothole, some passerby would always rescue it and send it toward its goal."

All the Robots (2007)

What will our future interactions with robots be like? Will robots be obedient or defiant? Will our relationships with them be intimate, or equal? Will they take care of us or will we take care of them? Dunne and Raby explore the range of these dynamics, which have already become part of our lives, whether with Roomba vacuums or Alexa speakers. The robots – some independent, others needy, neurotic, and timid – are individuals with distinct personalities and quirks and behaviors that emerge over time.

@ (1971)
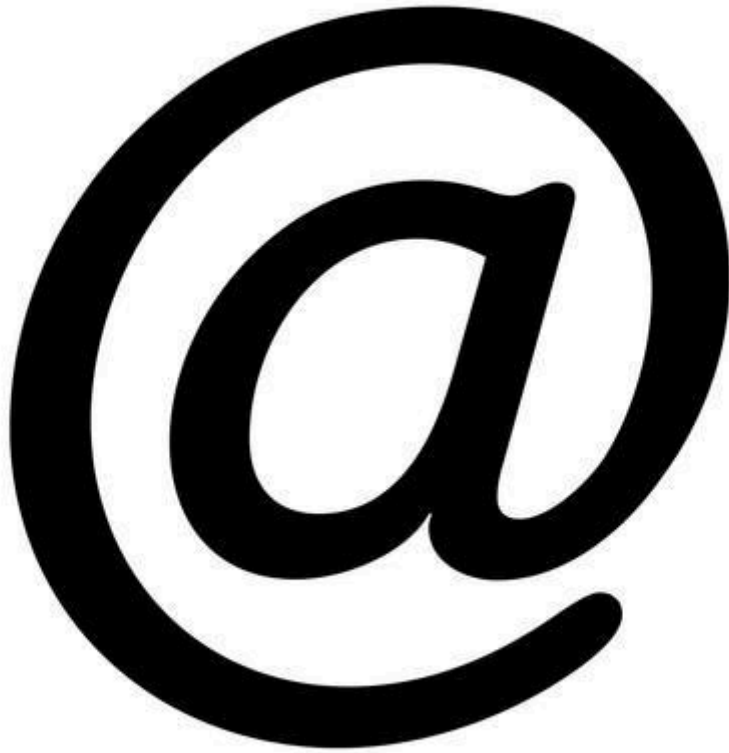
Some scholars believe the @ symbol dates as far as back as the sixth century; others believe that it originated in sixteenth-century Venetian trade as an abbreviation of "amphora," a terra-cotta vessel whose size became a standard unit of measure. Since the nineteenth century, @ has appeared on standard keyboards as the "commercial *a*," used mostly by accountants. In 1971, when Tomlinson created the world's first email system for the US government's Advanced Research Projects Agency Network (ARPANET), he adopted @ as a stand-in for the technical programming language indicating a message's destination – repurposing an underused symbol for a brand-new technology.

Macintosh SE Home Computer (1984)

Graphic icon sketches (1982-1983)
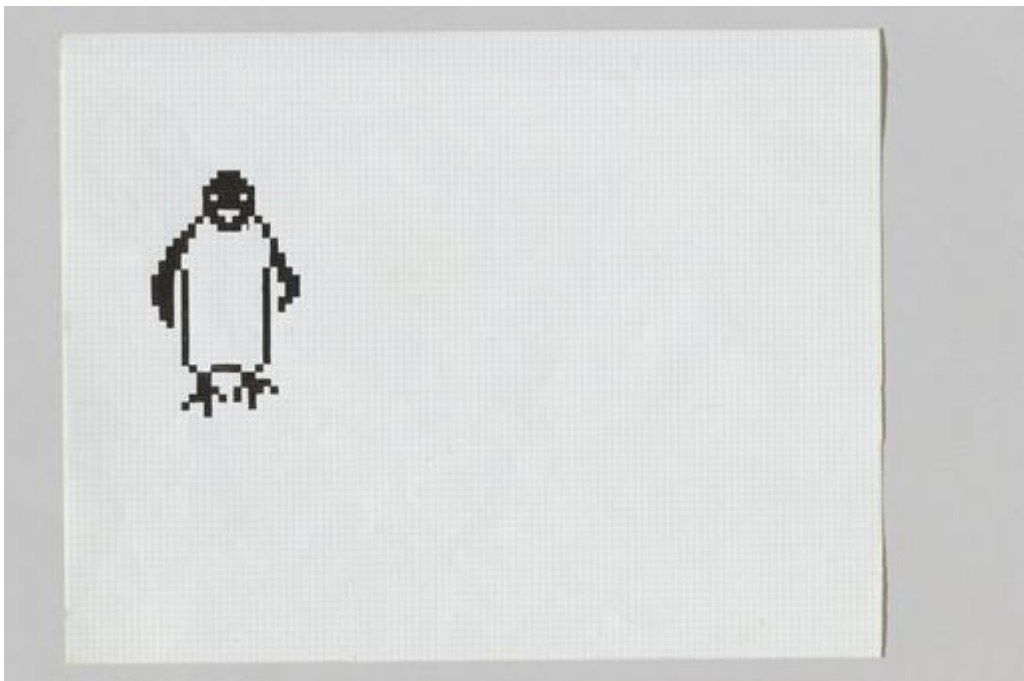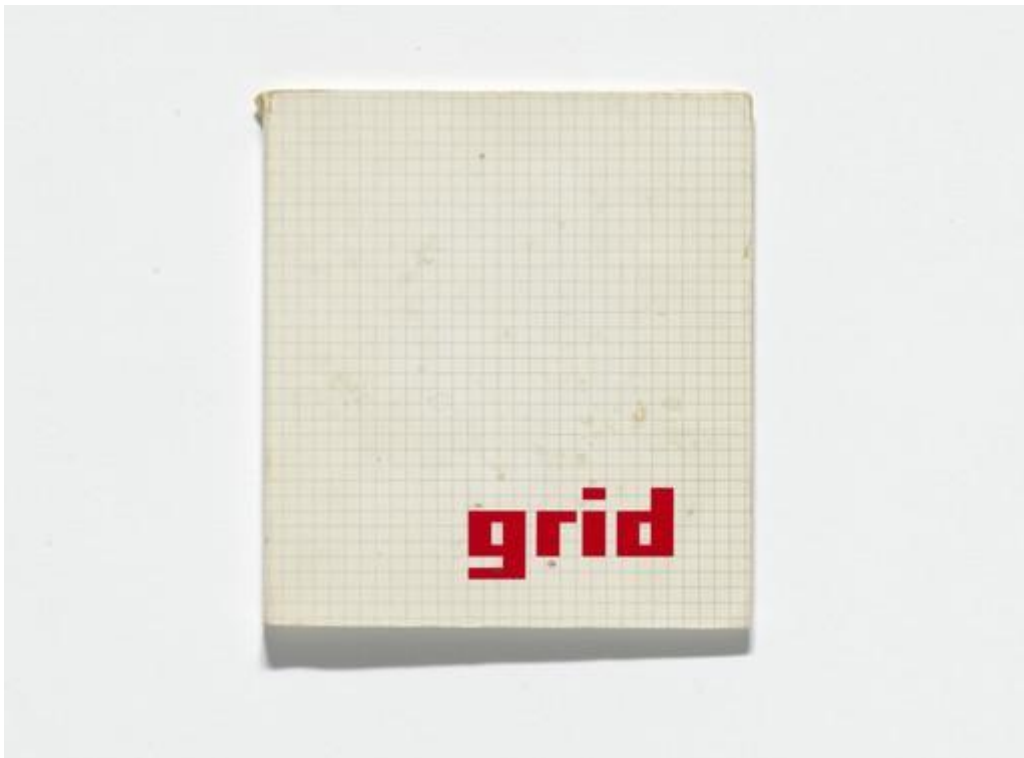
To design <mark>the icons for the Macintosh System 1, Apple's first computer-operating system</mark>, Susan Kare used the decidedly analog method of pencil and pen on graph paper, with each square representing a single pixel. Her icons are perfect translations of various word-processing and operating functions – a pair of scissors for cutting text, a trash bin for deleted files. These pictograms were designed to be a language intelligible to users in any country – a fully intuitive graphic user interface (GUI) whose influence remains evident in today's devices.

Signs of Life (2007-2009)

Yauner's exit sign is controlled by a motion sensor. When people are moving near the sign, it functions as a standard static emergency-exit sign. However, when there is no motion near the sign, the overworked pictogram takes a break from running and participates in a number of activities, from watching TV to taking a nap. By animating the stationary running man we see every day and usually ignore, Yauner gives the exit sign a life of its own and challenges the viewer to notice and observe ordinary objects.

Thinking Machine 4 (2003-2004)

When you play a game of chess with Thinking Machine 4, its designers explain, "the machine's evolving thought process becomes visible on the board before you." Using the game's thousands of possible outcomes, the computer generates a map showing "invisible lines of force" in a visualization of the power of its thoughts.

Wind Map (2012)

Wind Map pulls information from the National Digital Forecast Database, which is maintained by the National Weather Service and available to the public. <mark>The app gathers these forecasts, which are time-stamped and revised every hour, to create a "living portrait" of the wind landscape over the United States.</mark> "An invisible, ancient source of energy surrounds us, energy that powered the first explorations of the world, and that may be a key to the future," the designers have said. Wind Map's patterns serve as useful data visualization and, as we consider alternative energy sources, a reminder of the power of wind.

Dwarf Fortress (2006)
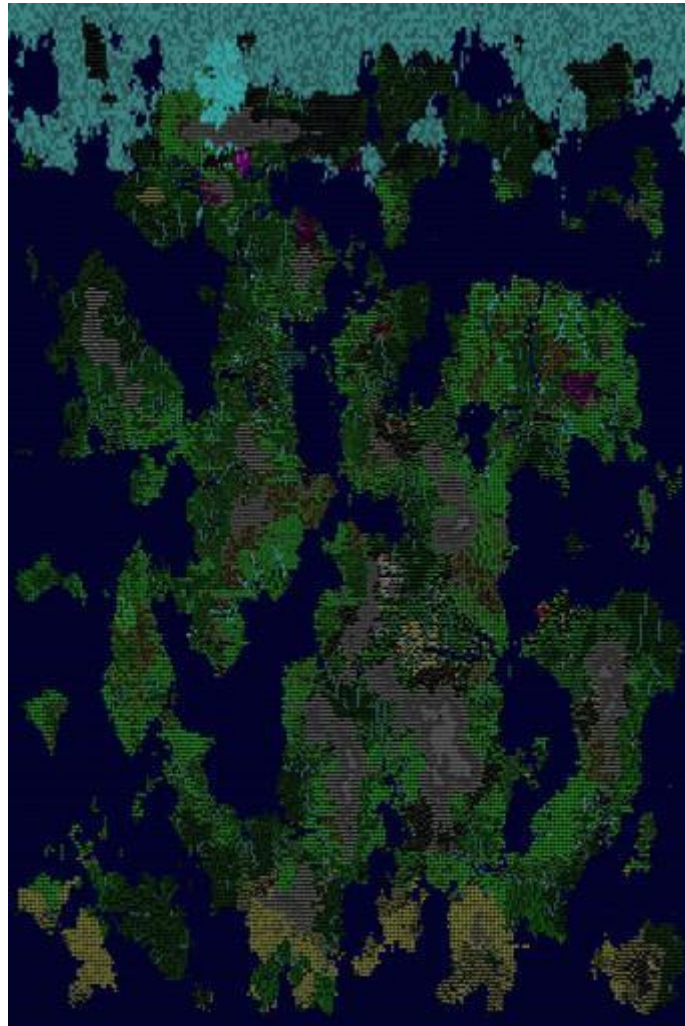
The earliest computer games were programmed using ASCII (American Standard Code for Information Interchange). The developers of Dwarf Fortress, a single-player fantasy game, purposely forwent subsequent developments in computer graphics, choosing its retro aesthetic. Rather than relying on a naturalistic three-dimensional interface, the game generates its own complex world, which the player can modify, out of classic two-dimensional tiled building blocks and text-based graphics. The goal is to build a viable dwarf settlement in a vast user-generated world of continents and seas. Every terrain has multiple levels, on the surface and below it, with more than two hundred rocks and minerals that players can mine and make tools from. In order to succeed, players must forge alliances with competing civilizations, consider how a wide range of factors (including natural resources and weather conditions) will influence their dwarf colonies, and learn to navigate an abstract world.

Flower (2009)

<mark>In Flower, the player becomes the wind.</mark> The game is presented as a potted flower's dream, in which the wind blows one of its petals away from the city and into a verdant landscape. The wind picks up more petals as it goes, and the pleasantly aimless journey becomes increasingly vivid and intense. There is no goal, only complete immersion in nature and whatever sensations that brings – whether thrilling, soothing, or contemplative.

Never Alone (Kisima Innitchuna) (2014)

Nuna, an Inupiaq girl, sets out with her arctic fox on a quest to save her village from a ravaging blizzard. To restore balance to the environment, she must solve a series of challenges by gathering and using knowledge about the traditions of her people. This unique combination of puzzle-adventure game and cultural exploration was created in collaboration with the Indigenous Inupiaq community of Southcentral Alaska. The insight Nuna receives from her elders reinforces the importance of passing wisdom between generations, making Never Alone a powerful document of the heritage and language of a living people.

Getting Over It with Bennett Foddy (2017)

" It's the kind of player who feels entitled to make progress and eventually win – an expectation Foddy delights in thwarting. The goal is to climb a mountain of rocks and garbage, but the character attempting it is awkwardly stuck in a cauldron, and the game's controls are infuriatingly – deliberately – clumsy. Players cannot save their progress; mistakes can tip the character down the mountain, back to the beginning.

Everything Is Going to Be OK (2017)

At first glance, Everything Is Going to Be OK seems absurd – a set of nonsensical interactive vignettes animated in a cartoonish, early-internet style. In reality, however, it is a highly personal exploration of trauma and coping mechanisms, based on the artist's experiences as the target of harassment and abuse. Natalie Lawhead considers this loud, garish work an interactive zine rather than a video game, but the interaction is one-sided and unpredictable: in this game – as in life – nothing is within the player's control.

The Designer

The test of well-designed interface is how easy it is to use – the degree to which it is accessible, functional, and instinctive. Badly designed features make tasks harder to accomplish, while thoughtful ones can make even the most difficult tasks easier.

When it comes to video games, however, not all designers aim for ease and entertainment. Some delight in breaking these rules, deliberately taking players on a ride in which efficiency and clarity are gleefully ignored in favor of friction and even chaos. The designer might take control of the game's narrative, robbing players of their agency and reminding them how little power they have over how their lives unroll. Or, rather than presenting intelligible rules with logical consequences, the designer might create an atmosphere of tension and unpredictability, in some cases prompting players to resist the nonsensical conditions forced upon them by the game and complete the interaction by finding their own solution.