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ARTICLE

NODE «AI, ARTS & DESIGN: QUESTIONING LEARNING MACHINES»

Intelligent Environments and Public Art

Eitan Mendelowitz
Mount Holyoke College

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Abstract

Intelligent environments combine the promise of ubiquitous computing with artificial intelligence and are increasingly being used in public art. The agent-based approach to artificial intelligence (AI) uses the *intelligence function* to characterize agent-based behavior. The inputs to the intelligence function, perception of the environment and the agent's internal state, combined with the outputs of the function, actuation and changes in internal state, provides a lens with which to categorized AI-based public art. Such works can be classified as generative, reactive, interactive, learning, or static. To illustrate this taxonomy, this paper gives examples of public artworks that fit into each of the five categories and uses the taxonomy to suggest new areas of creative inquiry.

Keywords

public art, intelligent environments, ubiquitous computing, artificial intelligence, interactive art, generative art

Entornos inteligentes y arte público

Resumen

Los entornos inteligentes combinan la promesa de la computación ubicua con la inteligencia artificial y se utilizan cada vez más en el arte público. El enfoque basado en agentes de la inteligencia artificial (IA) utiliza la función inteligente *para caracterizar el comportamiento basado en agentes. Las entradas a la función inteligente, la percepción del entorno y el estado interno del agente, combinadas con las salidas de la función, la actuación y los cambios en el estado interno, proporcionan un baremo con el que clasificar el arte público basado en IA. Estas obras se pueden clasificar como generativas, reactivas, interactivas, de aprendizaje o estáticas. Para ilustrar esta taxonomía, este artículo proporciona ejemplos de obras de arte públicas que se ajustan a cada una de las cinco categorías y utiliza la taxonomía para sugerir nuevas áreas de investigación creativa.*

Palabras clave

arte público, entornos inteligentes, computación ubicua, inteligencia artificial, arte interactivo, arte generativo

Introduction

"[Ubiquitous computing] created a new field of computer science, one that speculated on a physical world richly and invisibly interwoven with sensors, actuators, displays, and computational elements, embedded seamlessly in the everyday objects of our lives and connected through a continuous network." (Weiser, Gold, and Brown 1999). This world, originally envisioned in the '80s, is becoming a reality through the availability of affordable and accessible devices like the Microsoft Kinect, Arduino, Raspberry PI, and inexpensive LEDs.

Intelligent environments, ubiquitous computing technologies coupled with artificial intelligence (AI), is currently being adopted by artists to create interactive public art. After defining two key terms – *public* art and *artificial intelligence* – and discussing the use of AI in art in general, this paper proposes a novel taxonomy for categorizing public art that uses AI as a medium and applies the taxonomy to some recent public artworks.

Public Art

While there is some disagreement over the precise definition of public art, this paper will use an expansive definition - public art is art that is situated in public spaces rather than traditional art contexts like museums and galleries (Zebracki 2013). In describing public art, the Association for Public Art stresses that public art is not a medium or an art form in and of itself but is primarily defined by the artwork's setting ("What Is Public Art?" n.d.).

Artificial Intelligence

Similar to the term public art, the term artificial intelligence is commonly used but poorly defined. The Turing Test is a popular way to determine if a human-made system is intelligent. Seeping into popular culture (Tyldum 2014; Square Enix 2016), the Turing Test is often the first thing people think of when they think of AI. Turing proposed different versions of his test but, at their core, the tests describe a system as artificially intelligent if a human evaluator is unable to distinguish the system from a human through conversation (Turing 1950). Unfortunately, the Turing test can only be applied to behaviors that are thought of as humanlike, it cannot be used for non-humanoid systems like the intelligent environments often used in public art.

An expansive definition of AI was offered by the Dartmouth Workshop where the term Artificial Intelligence was originally coined: "...the artificial intelligence problem is taken to be that of making a machine behave in ways that would be called intelligent if a human were so behaving." (McCarthy et al. 1955). To paraphrase the Dartmouth Workshop's definition of AI, "we know it when we see it". While the Workshop provides a workable definition of AI it does not offer a way to evaluate, analyze or classify such systems.

Artificial Intelligence in the Arts

Almost as soon as computers became available, they were used to create generative digital art. While artists like Frieder Nake (Nake 2005) and Vera Molnar (Roe-Dale 2019) created algorithmic art in the sixties, these works did not employ techniques commonly thought of as AI. Among the first AI-based artworks was *AARON* by Harold Cohen (Cohen 2016). *AARON*, first built in 1973 and continually developed and maintained for over 40 years, uses an expert system encoded by Cohen to create paintings. Starting in 1975 – contemporaneous with Cohen's early development of *AARON* – Myron Krueger created Videoplace (Krueger 1985). Videoplace is an early exploration of mixed reality. In *Videoplace*, two people in different rooms interact with each other through a system of video cameras and

shared projections. While the first versions of *Videoplace* used only video equipment, the development of Videoplace continued for over a decade. Later versions of the work employed custom computer systems coupled with image analysis and computer vision systems.

The use of AI in the media arts continued throughout the eighties and expanded in the nineties. In 1993, *Genetic Images*, by Karl Sims, used genetic algorithms to generate abstract images (Kelly 1994). In the same year Sims was "evolving" graphics, Simon Penny finished *Petit Mal*, an autonomous robotic artwork in which simple connectionist steering behaviours combine to create a charming and surprisingly expressive "artificial life" (Penny 1997). Also in the nineties, Ken Feingold began making talking animatronic heads powered by natural language processing techniques. Feingold continued this creative pursuit through the first decade of this century until today (Feingold n.d.).

Recently, the popularity and evocative nature of Google's DeepDream (Mordvintsev 2015) has spurred a trend in AI-based art. A number of artists are now using deep neural networks to train AI to create traditional-looking artworks. For example, *Memories of Passersby I*, (Vincent 2019) used thousands of portraits from the 17th to the 19th centuries to train a generative adversarial network (GAN) to create novel (if somewhat distorted) portraits. Similarly, Gene Kogan's Cubist Mirror (Mufson 2016) uses a webcam and style transfer to render live video of a museum space as a Cubist painting.

This recent style of generative deep neural network-based artwork is discussed in *Defining AI Arts: Three Proposals*, by Lev Manovich in which Manovich seeks to define "AI art". He proposes (and rejects) two possible definitions. His first proposal is to create a Turing test for art in which "art created by an AI" is defined to be "something that professionals recognize as valid historical art or contemporary art." The problem with this approach, Manovich points out, is that it limits AI art creation to already existing art forms and precludes the AI's participation in the expansion of art into new expressions and modalities. In his second proposal, Manovich asks rhetorically if the use of AI techniques in an artwork's production can be employed to distinguish "AI art" from other digital art. Manovich rejects this definition by pointing out that the human artist often exerts a high level of control even in artworks that use AI techniques and therefore these artworks should still be considered more human-created than "AI art".

Finally, Manovich concludes by offering a third definition:

> "AI art is [a] type of art that we humans are not able to create because of the limitations of our bodies, brains, and other constraints. One such possibility I sketched above is computer generated objects, media, situations and experiences that do not have the usual systematically and predictability of human arts - but they are not random either, they don't mechanical[ly] juxtapose elements just to shock, and they are not simply instances of remix aesthetics." (Manovich 2019)

An unwritten assumption in Manovich's essay is that "AI art" is artwork *produced* by an artificially intelligent system. For example, the "Turing AI arts" test, as described by Manovich, focuses on the output from the AI to determine if the AI is an artist. His second proposal is rejected because even if AI algorithms are used, the system's creator still has a controlling hand in the output. Because of his assumption, he concludes that only a truly autonomous AI system creating something different than that created by humans can be considered "AI art". Unlike Manovich, this paper considers AI a medium in and of itself. When evaluating "AI art", this paper does not look at the output from an AI but the system itself. Building upon the Dartmouth Workshop's broad definition for AI, this paper considers AI Art any artwork that uses algorithms and techniques commonly considered intelligent. In a sense, this paper embraces Manovich's second proposal without worrying about issues of algorithmic autonomy – the artwork is the human-designed AI system and not the system's output.

Motivation

The creation of AI-based art began in the seventies, expanded in the nineties and is recently enjoying a new surge of attention. Missing from the discourse are methods for categorizing such AI-based artwork in a consistent manner. In proposing a taxonomy for AI art and applying it to public art, I hope to provide a method to compare and contrast AI-based artwork. As such work becomes increasingly prevalent, this taxonomy may provide a tool for more nuanced discussions by building on decades of research in agent-based AI.

Intelligent Agents

An agent-based approach to AI, popularized in the mid'90s by the influential textbook *Artificial Intelligence: A Modern Approach*, argues that intelligence should be judged by an agent's ability to achieve goals

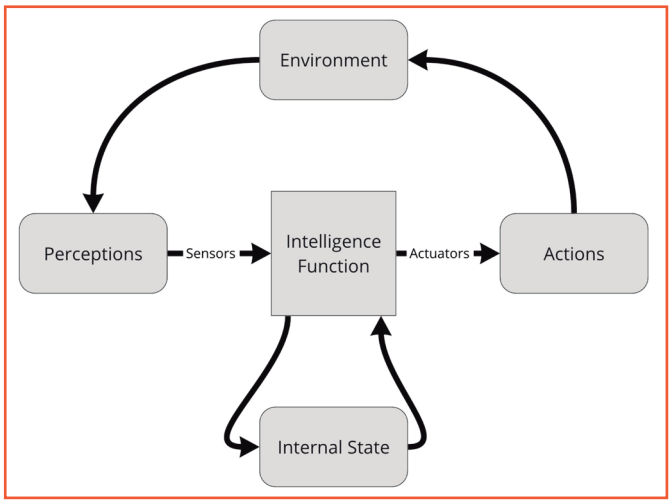

Figure 1: The Intelligence Function.

in its environment. In this formulation, the behavior of an intelligent agent is a function of its perception of the environment – as perceived through sensors – and the agent's internal state. This *intelligence function* maps perceptions and internal state onto actions. Actions are either external actions enacted by the agent upon the environment through actuators, or internal actions, i.e. the updating of internal state (Russell, Norvig, and Davis 2010).

A Taxonomy of AI-Based Public Art

The intelligence function provides a useful tool to analyze AI systems. Individual agents can be characterized by:

1. The amount to which the agent's intelligence function relies on their perceptions.
2. The amount to which the agent's intelligence function relies on the agent's internal state.
3. The amount to which the agent's actions affect its environment. And,
4. The amount to which the agent's actions change its internal state.

In other words, an AI can be characterized by 4 metrics:

1. Perception
2. Introspection
3. Actuation
4. Self-Mutability

These metrics can be used to create a taxonomy of intelligent environments and AI-based public art. While these four measures are continuous, it is useful for classification to think of these measures as binary (high/low):

- AI-based artwork whose intelligence function is based exclusively on its internal state (introspection) and ignores any sensory input (or has no sensory input) can be classified as *generative*.
- AI whose actuation is based almost entirely on perception while ignoring its internal state can be termed *reactive*.
- Artwork whose intelligence function is influenced by both perception and introspection but does not modify its internal state is *interactive*.
- AI-based art that changes its internal state in response to perception and responds to a combination of its perceptions and internal state is *learning*.

	Perception	Introspection	Actuation	Self-Mutability
Generative	Low	High or Low	High	High or Low
Reactive	High	Low	High	High or Low
Interactive	High	High	High	Low
Learning	High	High	High	High
Static	High or Low	High or Low	Low	High or Low

Figure 2: Intelligent Agent Taxonomy.

- An artwork that has no actuation can never effect a change outside of its internal state. It is, from the perspective of the public, *static*.

While there are sixteen permutations of the four binary metrics, there are only five meaningful combinations of these values. When considering static artworks, the distinction between works that do or do not modify their internals state, or that do or do not introspect is meaningless. These works are unchanging in the environment. What does it mean to perceive or introspect if no actions are ever taken? Similarly, because generative work ignores the environment, it makes little difference to the art patron whether or not the AI is modifying and/or reacting to its own internal state. The distinction is opaque to the outside observer.

And, since the internal state of a reactive work does not affect the art-work's actuation, it does not matter if the artwork modifies its internal state since that state is ignored.

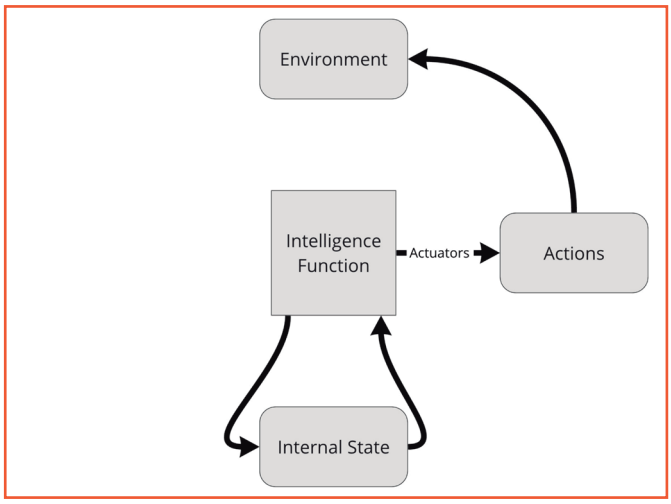

Figure 3: Generative AI

Generative AI

Generative systems either ignore their preceptors or have no sensors with which to perceive. It is an approach employed by Refik Anadol in many of his recent public artworks. Anadol uses artificial intelligence techniques and machine learning to transform datasets into 3D data visualizations that he calls "data sculptures" (Simonite 2020). In his 2018 work, *WDCH Dreams*, Anadol employed machine learning algorithms to form associations between 587,763 images, 1,880 videos, 1,483 metadata files, and 17,773 audio files drawn from Walt Disney Concert Hall's archives. According to Anadol, this "mind" is designed to mimic human dreams. The resultant visualizations were projected onto the Concert Hall's skin as part of a week-long public art installation and were also used for a year-long exhibition inside the Concert Hall's Ira Gershwin Gallery (Anadol n.d.).

Another example of a generative public artwork is the 2016 installation *Diffusion Choir* by Sosolimited, Plebian Design, and Hypersonic. *Diffusion Choir* was commissioned by Biomed Realty and is installed in Cambridge, Massachusetts. In *Diffusion Choir*, 400 Tyvek origami objects hang from the ceiling of an atrium in a 3D array. Each object can open and close like a small cocktail umbrella. The motion of the Tyvek objects is driven by a simulation of a flock of birds (Sterling 2018). Like WDCH Dreams the behavior of Diffusion Choir is completely determined by its internal data.

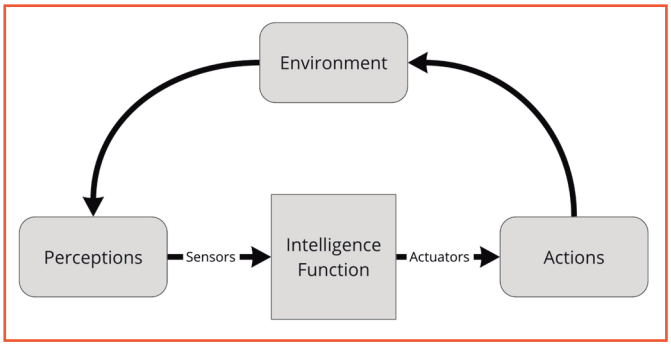

Figure 4: Reactive AI

Reactive AI

Reactive systems' actuation is based entirely on the agent's perceptions of the environment. For example, *HeartHug* by Dmitry Sokolov was installed at the Canal Convergence festival in 2019. In this work, a large heart-shaped sculpture made of florescent lights hangs above an open area. A computer vision system observes people below. Half the heart sculpture lights up when a person is below the sculpture but the entire heart is only activated when two people stand under the heart and hug.

A second example of reactive public art is *Cloud Display* by Rafael Lozano-Hemmer installed in the Manchester International Festival in 2019. In this work, participants speak into a microphone. A speech to text system recognizes the spoken words and writes them in mist on a billboard-sized display made out of 1600 ultrasonic water atomizers (Lozano-Hemmer n.d.). Like *HeartHug*, *Cloud Display* is entirely reactive, the behavior of the artwork is driven entirely by participant action.

Interactive AI

Interactive systems combine the introspection of a generative system with the perception of a reactive system. Many interactive public artworks use sensors to trigger database queries, the results of which are used as source material for display. *The City Pulse*, a collaboration between Local Projects, Legends, NowArchival, and The Hettema Group in 2015, is installed in the one-hundredth-floor observatory at One World

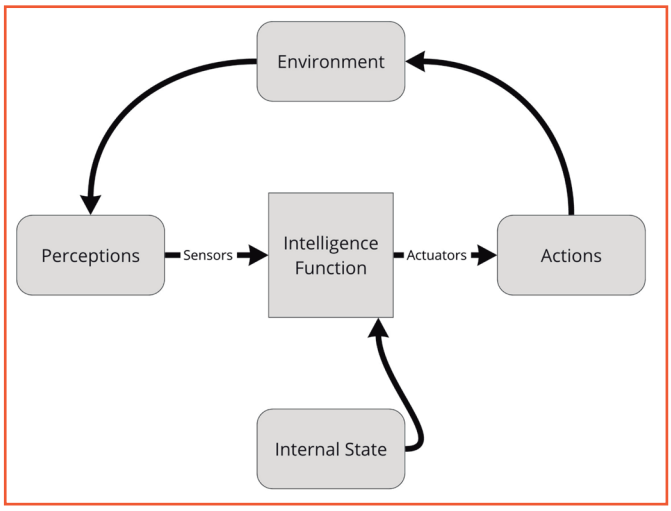

Figure 5: Interactive AI

Trade Center. In *The City Pulse*, professional actors and comedians fill the role of "ambassadors". The "ambassadors" stand in front of a ring of displays and interact with an audience, telling an improvised story. Throughout the story, they use gestures to retrieve and display media on the ring (Wilson 2015). In this intelligent environment, the "ambassador" is the interactor while the public acts as an audience.

In *Which is your Brass Voice?*, the public is invited to speak or sing into any of five microphones. Each microphone represents a different brass instrument. AI software records the sounds and notes performed by the public and translates them into the sounds of a brass band. These sequences are used by the AI to create compositions generated from a large musical knowledge base of hundreds of brass band scores. When played, the sounds also trigger an animation on an accompanying LED sculpture (Ronchi 2012).

A final example of a public artwork using interactive AI is *Drive By* by Electroland. This 2007 Society for Experimental Graphic Design award winner consists of a 240-foot-long custom LED display perched along the roofline of a building in North Hollywood. A custom computer vision system monitors the street below for vehicular traffic. The passing of automobiles cause *Drive By* to retrieve and display a quote from its large database of movie quotes (Makowski 2013). *Drive By* responds to its perceptions and uses introspection to choose quotes but its internal state is unchanged, it does not learn.

Learning AI

Like interactive public art, learning AI actuation is a function of perception and internal state. However, learning systems are distinct from interactive public art in that they modify their internal state. With a learning system, the artwork's behavior can change over time, even when faced with the same perceptions. A learning AI uses all aspects of the intelligence function.

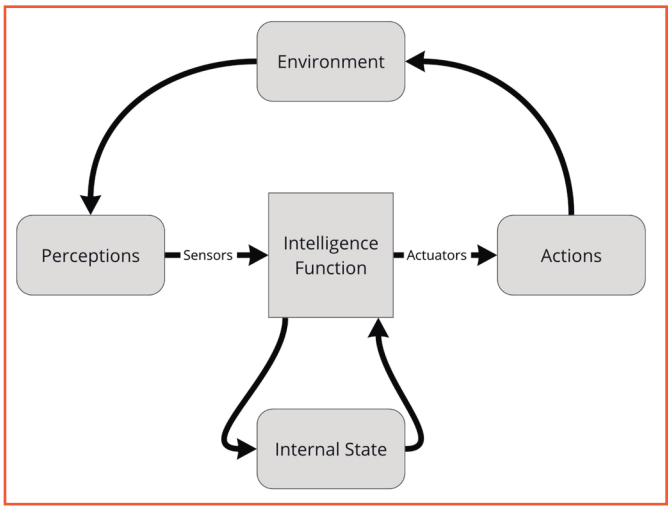

Figure 6: Learning AI

Many of David Rokeby's artworks address the subject of artificial intelligence and learning. His groundbreaking work *Very Nervous System (VNS)* was awarded the Prix Ars Electronica Award of Distinction for Interactive Art in 1991. VNS has been installed in both private and public art contexts. In VNS, a computer vision system detects and processes movement within the installation space. Movements are used to stimulate a neural network which in turn produces music. What is unique about VNS is that the neural network is constantly in flux, its levels of activation, and the strength of its synaptic connections are constantly changing in response to interaction and its own internal state (Rokeby 2010). While the behavior of the system is consistent and not random, it is also never exactly the same.

Amatria, by Philip Beesley, hangs above the atrium of Luddy Hall at Indiana University. A tangle of 3D-printed forms, white Mylar, acrylic plastics, wire, glass, and lasercut stainless steel, *Amatria* looks like a massive chandelier spun out in a web by a nest of robotic spiders. Embedded throughout the structure are motion sensors, microphones, electrical current sensors (for proprioception), motors, LEDs, and speakers. The work moves, lights up, and makes sounds in response to the movement of visitors (Beans 2018). The 2018 work utilizes a "curiosity based learning algorithm" that uses reinforcement learning to maximize knowledge gains and to "generate interactive behaviors and adapt to change" (Chan 2016). What is most interesting about *Amatria* is that its behaviors are constantly changing as a result of its interactions with the public.

Static AI

AI-based public art that has no actuation is static. A static work can be a sculpture, mural, or any other medium that does not change over time. Even without actuation, artificial intelligence can still be used in an artwork's design or construction. For example, *Dio* is a sculpture by Ben Snell. Snell used machine learning algorithms trained on over 1000 images of classical sculptures. The resultant AI then constructed a model that was used to 3D print a mold. Using the mold, Snell cast *DIO* using a resin containing the ground-up remains of the computer used in DIO's design (Schwab 2019).

Dio is not an example of public art. In fact, at the time of this writing, there does not seem to be *any* static AI-based public artwork. This conclusion was reached after exhaustively examining the portfolios of artists listed by *AIArtists.org* ("Global Directory of AI Artists" n.d.), searching the *Public Art Archive* ("Public Art Archive" n.d.) and searching various other art-related sources on the internet. By using the intelligence function-based taxonomy we have discovered a previously overlooked potential branch of AI-based public art.

Conclusion

This paper introduces an approach to classifying AI-based public artwork into five categories: *generative*, *reactive*, *interactive*, *learning*, or *static*. It then gives examples of public artwork that fit into each category. While engaging in a survey of existing work it became apparent that the majority of AI-based public art is either generative or interactive. While *VNS* and *Amatria* are excellent examples of learning AI, there are very few other public artworks that fit in this category. And, there are even fewer static works (if any exist at all). This would suggest that the creation of *learning* or *static* AI-based public artworks would be contributions to the public art community. By using the intelligence function-based taxonomy to analyze existing AI-based public art, this paper has revealed artistic approaches that can yield novel creations.

References

Anadol, Refik. "WDCH Dreams." Accessed March 30, 2020. http://refikanadol.com/.

Beans, Carolyn. "Science and Culture: Sentient Architecture Promises Insight into Our Evolving Relationship with AI." *Proceedings of the National Academy of Sciences* 115, no. 30 (2018): 7638–40. https://doi.org/10.1073/pnas.1809390115

Chan, Tsz Kiu. "Curiosity-Based Learning Algorithm for Interactive Art Sculptures." February, 2016. https://uwspace.uwaterloo.ca/handle/10012/10278

Cohen, Paul. "Harold Cohen and AARON." *AI Magazine*, Winter 2016. 63-66.

Feingold, Ken. "Ken Feingold: Artworks and Documentation." Accessed June 1, 2020. http://www.kenfeingold.com/.

"Global Directory of AI Artists." AIArtists.Org. Accessed March 30, 2020. https://aiartists.org/ai-artist-directory.

Kelly, Kevin. "Genetic Images. When Computers Breed Art and Humans Direct the Flow of Fate, Startling, Alien Beauty is Born." *Wired Magazine* 2.09, September 1994.

Krueger, Myron W., Thomas Gionfriddo, and Katrin Hinrichsen. "VIDEOPLACE - an Artificial Reality." *ACM SIGCHI Bulletin* 16, no. 4 (April 1, 1985): 35–40. https://doi.org/10.1145/1165385.317463

Lozano-Hemmer, Rafael. "Rafael Lozano-Hemmer - Project 'Cloud Display.'" Accessed March 30, 2020. http://www.lozano-hemmer.com/cloud_display.php

Makowski, Ann. "Drive By." Text. October 21, 2013. https://segd.org/content/drive

McCarthy, John, Marvin Minsky, Nathaniel Rochester, IBM Corporation, and Claude Shannon. "A Proposal for the Dartmouth Summer Research Project on Artificial Intelligence." August 13, 1955.

Manovich, Lev. "Defining AI Arts: Three Proposals." June 2019. Accessed June 1, 2020. http://manovich.net/content/04-projects/107-defining-ai-arts-three-proposals/manovich.defining-ai-arts.2019.pdf

Mufson, Beckett. "Feel Like Pablo with This 'Cubist Mirror'." *Vice*, May 25, 2016, https://www.vice.com/en_us/article/aen9vb/cubist-neural-network-mirror

Mordvintsev, Alexander, Christopher Olah, and Mike Tyka. "DeepDream - a code example for visualizing Neural Networks." 2015. *Google Research* 2, no. 5.

Nake, Frieder. "Computer art: a personal recollection." *Proceedings of the 5th Conference on Creativity & Cognition (C& C '05)*. Association for Computing Machinery, New York, NY, USA, 54–62. 2005. https://doi.org/10.1145/1056224.1056234

Penny, Simon. "Embodied cultural agents: at the intersection of robotics, cognitive science, and interactive art." In AAAI Socially Intelligent Agents Symposium. 1997.

Public Art Archive. Accessed March 30, 2020. https://www.publicartarchive.org/.

Roe-Dale, Rachel R. "Vera Molnar's Exploration of the Unimaginable." *Math Horizons* 26, no. 4 (May 15, 2019): 18–21. https://doi.org/10.1080/10724117.2019.1568081

Rokeby, David. "David Rokeby : Very Nervous System." November 24, 2010. http://www.davidrokeby.com/vns.html.

Ronchi, Gloria. "Aether and Hemera's LED Installation Uses Artificial Intelligence to Transform Human Voices into a Brass Band Light Show." October 11, 2012. https://inhabitat.com/aether-and-hemeras-led-installation-uses-artificial-intelligence-to-transform-human-voices-into-a-brass-band-light-show/.

Russell, Stuart J., Peter Norvig, and Ernest Davis. *Artificial Intelligence: A Modern Approach*. 3rd ed. Prentice Hall Series in Artificial Intelligence. Upper Saddle River: Prentice Hall, 2010.

Schwab, Katharine. "Why This Artist Ground His Computer into Dust." Fast Company. April 12, 2019. https://www.fastcompany.com/90333795/why-this-artist-ground-his-computer-into-dust

Simonite, Tom. "Artist Refik Anadol Turns Data Into Art, With Help From AI." *Wired*, January 16, 2020. https://www.wired.com/story/artist-refik-anadol-turns-data-art-help-ai/

Square Enix. *The Turing Test* (version Microsoft Windows, Xbox One). 2016.

Sterling, Bruce. "Diffusion Choir." *Wired*, November 27, 2018. https://www.wired.com/beyond-the-beyond/2016/10/diffusion-choir/.

Turing, Alan. "I.—COMPUTING MACHINERY AND INTELLIGENCE." Mind LIX, no. 236 (1950): 433–60. https://doi.org/10.1093/mind/LIX.236.433

The Imitation Game. Directed by Morten Tyldum. Black Bear Pictures, FilmNation Entertainment, Bristol Automotive, 2014.

Vincent, James. "A neverending stream of AI art goes up for auction." *The Verge*, Mar 5, 2019. https://www.theverge.com/2019/3/5/18251267/ai-art-gans-mario-klingemann-auction-sothebys-technology

Weiser, Mark, Rich Gold, and John Seely Brown. "The Origins of Ubiquitous Computing Research at PARC in the Late 1980s." *IBM Corp*, 1999. https://doi.org/10.1147/sj.384.0693

Association for Public Art (blog). "What Is Public Art?" Accessed March 28, 2020. https://www.associationforpublicart.org/what-is-public-art/.

Wilson, Mark. "The Coolest Thing About 1 World Trade Center's New Observatory Isn't The View." Fast Company. May 29, 2015. https://www.fastcompany.com/3046750/the-coolest-thing-about-1-world-trade-centers-new-observatory-isnt-the-view.

Zebracki, Martin. "Beyond Public Artopia: Public Art as Perceived by Its Publics." *GeoJournal* 78, no. 2 (2013): 303–17. https://doi.org/10.1007/s10708-011-9440-8

CV

Eitan Mendelowitz
Mount Holyoke College
emendelo@mtholyoke.edu

As a transdisciplinary artist, Eitan explores the cultural implications of the algorithmic creation of meaning while exposing the wonder inherent in the generation of knowledge. His process blends performance, generative literature, gameplay, installation, and public art, with embodied interaction, physical interfaces, and artificial intelligence to create works situated at the intersections of computer science and the arts. His work articulates the expressive potential of artificial intelligence as a newly emerging cultural form.

Eitan's work has been shown internationally at venues including SIGGRAPH, ArtFutura, ArsElectronica, and the Beall Center. Eitan is a Visiting Assistant Professor at Mount Holyoke College where his creative research and art production inform his teaching of algorithmic art and computer science. Eitan holds a Ph.D. (2009) from UCLA in computer science and an MFA (2002) in design | media arts.