Artists + Machine Intelligence (AMI) Research Awards

Google Research

Historical awardees

Google's Artists + Machine Intelligence (AMI) Research Awards provide funding for creative applications of Artificial Intelligence (AI) and cultural research related to machine learning (ML) that looks at technology's implications and impacts on individuals and society. See below for a summary of research funded by award year.

2022 awardees

The Hague University of Applied Sciences Chris Detweiler *Sociotechnical Considerations of AI in Music Technology*	Chris Detweiler leads the Philosophy and Professional Practice Research Group at The Hague University of Applied Sciences. His research at the Hague studies new technologies, and the design practices and technological cultures from which these emerge. For this research project Chris investigates the social impacts of AI technology in the creative arts. He will lead engaged research with musicians and music technology developers to propose methods to analyze and articulate the professional responsibilities of music technology developers. Before joining The Hague University of Applied Sciences, Chris worked as a social designer and researcher. He obtained his PhD on accounting for values in design in the Department of Values, Technology and Innovation and the Interactive Intelligence Group at Delft University of Technology. He has an MSc in Media Technology from Leiden University and a BA in Media Studies from the University of Amsterdam.
Institute for Advanced Architecture of Catalonia Mariana Quintero *If the Land Could Speak*	Mariana Quintero is a multimedia developer, interaction designer, and researcher at the Institute for Advanced Architecture of Catalonia (IAAC) in Barcelona, Spain. Her work investigates the rise of the third digital revolution and how digital information and technologies translate, represent and mediate knowledge about the world. For this project pilot, Mariana will lead immersive field research in Mallorca with local community partners to investigate how machine learning (ML) technologies might be used to bridge, hold, mediate and represent the complex interests, symbiotic relationships, cultural heritage, creative potential, and diverse embedded intelligences of a bioregion.
University of British Columbia Peter B. Reiner, in collaboration with Imre Bárd, London School of Economics and Political Science, and Ambrus Deák, The Los Angeles Film School *AI-enhanced Songwriting*	Peter Reiner is Professor of Neuroethics in the Department of Psychiatry at the University of British Columbia and a member of the Centre for Artificial Intelligence Decision-making and Action. For this project, Peter investigates whether (and how) AI-tools support or unsettle the practice of songwriting and its core values such as self-expression, excellence, emotionality, creativity, authenticity, and authorship. Together with Imre Bárd, Ph.D. candidate in Social Research Methodology at the London School of Economics and Political Science and Amrus Deák, Program Manager of Music Production at The Los Angeles Film School, the research team will conduct interviews with musicians who use ML-based technologies in music composition, using qualitative empirical tools to identify the impact of these technologies upon the values implicit in the praxis of songwriting.

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Parsons School of Design

Richard The
All At Once

Richard The is a designer, artist, and educator. His work investigates the aesthetic and cultural implications of an increasingly technology-driven society, and has been recognized by international design institutions such as D&AD, Art Directors Club New York, AIGA, Communication Arts, Type Director's Club Tokyo and Ars Electronica, Linz. For this project, Richard proposes a machine learning-based framework to understand, interrogate and interact with museum collections in artistic and poetic ways, and to build a set of machine learning tools for museums to analyze and visualize their open access digital museum collection in a myriad of ways. This research project builds on collaborations with Frédéric Eyl, Principal, Studio TheGreenEyl and Agnes Chang, Instructor, Columbia University.

New York University

 Mimi Yin and Pamela Pietro – in collaboration with NiNi Dongnier, Tiriree Kananuruk, Alexx Shilling, Nuntinee Tansrisakul, and Yuguang Zhang

An Intelligent Model of Choreography in 2-Dimensions

Mimi Yin is a multi-medium artist, designer, and educator. Her work explores programmatic approaches to composition and improvisation combining traditional forms with chance operations to create new structures. Pamela Pietro is an independent artist, educator and Associate Arts Professor and Acting Chair at New York University Tisch School for the Arts, Department of Dance. Together, their research project seeks to build a model of choreography capable of generating sequences of movement relationships between an artificial intelligence and a human mover in 2-dimensional space. The reductionist view seeks to sharpen the teams' ability to uncover structural elements that drive choreography across a wide range of movement styles and body types to uncover the fundamental building blocks of choreography and explore legibility and emotional impact across movement relationships and structures.

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2021 awardees

Southern California Institute of Architecture (SCI-Arc) Jennifer Chen *Views of Planet City: Pale Blue Dot Mk2*	*Views of Planet City* is a multi-year research project underway at SCI-Arc that critically investigates the possible implications of E.O. Wilson's "Half Earth" proposition to confine and concentrate human inhabitation of the planet to heal the global ecosystem. *Pale Blue Dot Mk2* is one of five segments of *Views of Planet City*, exploring what the Earth would look like from space in the epoch of Planet City. The project's objective is to simulate the passage of time represented in satellite images through predictive networks. Notably, the project considers remote sensing technology as a speculative medium, one that not only shows us direct correlations between the causes and effects of our collapsing climate, but that can be reinterpreted and synthesized using deep learning to imagine the reversal of planetary sprawl.
Carnegie Mellon University Daniel Cardoso Llach, Ph.D. and Jean Oh, Ph.D. *Rethinking AI and Automation in Architecture*	This project brings architecture, AI, and sociotechnical research methods together to imagine and realize humane scenarios for robotically-supported cooperative construction. We are interested in "robot in the loop" systems that adaptively support — rather than automate, replace, or surveil — the work of construction workers on building sites. Our reflective technology design process comprises ethnographic research and qualitative engagements with construction actors and sites, simulations, technical research combining robotics and reinforcement learning, and the development of a proof of concept system to be demonstrated on site. Striving for dynamic and safe robotically-supported construction environments, our project will help foster humane and sustainable practices in the architecture, engineering, and construction (AEC) industry, and foster new forms of expertise at the intersection of AI, robotics, the building trades, and architecture.
Goldsmiths, University of London Frederic Fol Leymarie, in collaboration with Dr. Daniel Berio and Xiaobo Fu *Movement-centric calligraphy and graffiti generation*	The aim of this research is to computationally generate handwritten art forms such as calligraphy and graffiti through the combination of sequence modeling methods and primitive-based representations of movement. We plan to go beyond the state of the art for generating handwriting, including calligraphy, which is largely based on inputs and outputs consisting of dense point sequences, by building up from our previous research across the fields of machine learning, motor control, visual perception, graphonomics (the experimental study of handwriting and related skills), as well as art practice. We hope to demonstrate that movement primitives can form a fruitful basis as a data representation to significantly improve the performance and robustness of today's sequence-based deep learning approaches to such generative tasks.
University of Toronto Tegan Maharaj, in collaboration with the	Predictive risk models can help us understand how population-level risks translate to individual-level risks, and how different risks can interact, in order to examine different actions and strategies for mitigating those risks.

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Cambridge Centre for the Study of Existential Risk *Explorisk: Visualizing Risk-Mitigation Scenarios*	This project proposes a collaboration with artists, graphic designers, and user-experience experts to develop an intuitive visualization tool for exploring different risk mitigation scenarios. The goal of this tool is to empower policy-makers, researchers, and other individuals to better understand and act upon risks. The core of the proposed research is to develop an intuitive visual language for expressing complex predicted scenarios — potentially short subtitled movies, augmented-reality 'pictures', flow-chart-type diagrams, or something else entirely — and an interface which allows researchers to choose between different visualization options.
Stanford University Michael Rau *Digital Performers Using AI*	This project applies computer vision and machine learning technologies to a 2,500 year old art form – theater – to improve virtual live performances and to discover new aesthetics of performance. The project approaches working with these systems of technology from a poetic and creative standpoint. What are the creative affordances that appear when we apply artificial intelligence to the representations of characters within a live performance? Can we improve theatrical streamed performances using machine learning? The project will undertake research in a creative field by exploring the aesthetics of a "digital performer" alongside a rigorous scientific analysis of the tools and technology to create new software tools, new dramaturgical constructions, and new performance techniques.

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King's College London **Mercedes Bunz and Eva Jäger** *Tools That Make Meaning*	Inspired by semiotics and its interpretation of the sign as a dual makeup of materiality/meaning, this project examines artist's use of backend interfaces in machine learning systems as places that create meaning. Through the work of artists, we will show that machine learning introduces a profound shift in the making of meaning, pushing it onto a novel terrain and freeing meaning as well as art-making from its traditional, representational mode. The first part of the research focuses on the digital materiality of machine learning. The second part of the research considers how creating with machine learning systems innovates our understanding of the making of meaning – in particular the process of decoding and encoding meaning which is now being calculated. The project seeks to show that cultural theories of non-representation are pointing towards a new and so far unexplored aspect of this new cultural technique that is making meaning.
University of Toronto **Beth Coleman** *Speculative AI: Octavia Butler and Other Possible Worlds*	This project engages with AI/ML frameworks to produce imaginaries of other worlds, specifically, an AI-system based on the speculative worlds of celebrated science fiction author Octavia Butler, whose work from the 1970s to the 2000s has emerged as a profound beacon for the sources, manifestations, and outcomes of contemporary life. Procedurally, this project seeks to move away from established models of supervised predictive modeling to investigate the "alien intelligence" of unsupervised ML ecosystems. By exploring methods of "speculative AI," the project stakes a commitment to the experimental design of machine learning that departs from predictive applications of AI that all too often imbed cultural bias into training and application methods. Claiming a space of the imaginary is a nontrivial act. In this case, it is designed to evoke wonder and delight.
University of Applied Arts Vienna **Anab Jain, in collaboration with Matthew Plummer-Fernandez** *Collaborative World Building with AI*	So much of contemporary media and science fiction revolves around the ideas of machines taking over humanity -- scenarios that perpetuate a foreboding sense of doom based on certain fictional ideas of how AI will shape society. Such narratives restrict public imagination about what our human-machine relationships could be like and what worlds we could generate together. Instead, we ask: What new stories, narratives, and worlds about the future of humans and AI can we imagine if they were collaboratively created by humans and AI? And what insights might these worlds give us about our increasingly entangled relationship with AI? As an educational department investigating plural futures, this project proposes an investigative workshop that explores what emerges when designers and (existing) AI agents collaborate in a world building exercise around the future relationship of humans and machines to contribute to the plurality of narratives about our human-AI futures.

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Goldsmiths, University of London Matthew Yee-King and Louis McCallum *Network Bending Differentiable Digital Signal Processing (DDSP)*	This project investigates how the emerging technique of 'network bending' can be used to provide novel creative control over sound synthesis networks based on the Magenta Differentiable Digital Signal Processing (DDSP) API (Engel et al. 2020). Network bending (Broad et al. 2020) aims to elicit interesting creative output from generative neural networks by applying various transformations to the activations of groups of network nodes. The technique has not yet been applied to an audio generating DDSP network. Through a collaboration with musicians to explore next-generation sound synthesis tools based on the DDSP neural vocoder system, we seek to provide access to the resulting sound synthesis neural networks to creative practitioners.
Southern California Institute of Architecture (SCI-Arc) Mimi Zeiger and Casey Rehm *Backyard Home Data Explorer: AI and The Future of Housing*	This project develops an interactive platform to make factors impacting housing development in the City of Los Angeles intuitive to a larger audience. *Backyard Home Data Explorer* is part of an ongoing research initiative of SCI-Arc's Urban Pasts and Futures Lab and Platform and Automation Lab that looks at how machine learning and Neural Network (NN) platforms might be leveraged to address critical issues within the built environment, with specific interest in the future of equitable housing. While some factors constraining construction of accessible dwelling units (ADUs) are obvious, like zoning setbacks and building area restrictions, the website will specifically visualize less apparent social, policy, and environmental impacts influencing new housing construction.

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2019 awardees

University of California, Los Angeles Rebecca Allen *Re-Emergence*	This project explores emergent behaviors of living systems in artificial environments. A VR experience powered by open-source Unity ML-agents and Python Tensorflow ML aims to create a connection with the state of our natural 'real' ecology, and provoke philosophical questions about behavior, humanity, and the nature of life.
Dedan Kimathi University of Technology Ciira Maina *Acoustic monitoring of ecosystems in Kenya*	Ecosystems around the world are under threat from human activity. To mobilize conservation resources and direct them to areas where conservation activities would have the most impact, ecosystems must be continuously monitored to detect deterioration and ensure appropriate interventions are put in place. In collaboration with Dr. Peter Njoroge (National Museum of Kenya), this project proposes to develop and deploy an acoustic monitoring system that uses specific bird vocalizations to infer an ecosystem's health. The project will deploy new ML models on hardware capable of performing machine learning inference at the edge like Coral and Raspberry Pi.
Royal College of Art Joshua Trees, in collaboration with Yvan Martinez and Krister Olsson *Public Foundry*	This project aims to be the first type foundry powered by the public, using machine learning to inspire a new generation of open source fonts representing diverse cultures, geographies and histories. Imagined as a public website where users upload images of typographic ephemera and artifacts such as street signs, graffiti, murals, posters, publications, postcards, receipts, tickets, etc., which are then converted into a complete set of glyphs and downloaded as font files, the project seeks to be an experimental resource for collecting, archiving and constructing letterforms, and reviving and reinventing typographies to perform alternative pasts and speculative futures.
University of Washington Tivon Rice *Models for Environmental Literacy*	This research explores how humans learn about the natural environment, and asks the same of intelligent systems. How (and why) are machines made to control natural environments? To what degree can a machine perceive a landscape, drawing upon data rather than lived experiences? Can our observation of this machine perception help us reflect upon human nature, our individual understanding of the environment, and other non-anthropocentric ecological perspectives? The resulting eponymous film explores in a speculative manner how A.I.s could have alternative perceptions of an environment.

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Southern California Institute of Architecture (SCI-Arc) Benjamin Bratton and Casey Rehm *How Cities See: Machine Sensing and Cognition at an Urban Scale*	Significant work is being done to improve the ability for autonomous vehicles, tracking systems, and interactive utilities to perceive and respond to the built environment and its occupants. This project will invert that relationship by using machine learning to generate new architectural and urban designs to better suit these new non-human occupants. This project employs generative machine learning algorithms to study an urban site in Los Angeles and explore how design elements in existing and emerging urban infrastructure (e.g. building facade treatments, street furniture, paving patterns, automated systems) may be augmented and/or transformed by embedded machine sensing and artificial intelligence.
Goldsmiths, University of London Rebecca Fiebrink and Phoenix Perry *Building Interactive Machine Learning Tools For Game Developers*	Game developers currently lack machine learning tools that provide supervised learning algorithms most useful for working with sensor data, that are accessible to machine learning novices, that enable developers to easily create and refine bespoke models from new examples, and that allow both seamless deployment of games incorporating these models and easy sharing of trained models across the developer community. We propose to build a tool that meets all these criteria, as a Unity plug-in for interactive machine learning that enables game developers, as well as creators of VR and AR experiences, to use supervised learning to build richer interactions with sensors, audio and video, and other real-time data streams.
University of California, Los Angeles Lauren McCarthy *SOMEONE*	*SOMEONE* imagines a human version of Amazon Alexa, in which individual homes are watched over and remotely controlled through a custom system of cameras, switches, lights, and appliances. The human smart homes will be monitored and run via a command center, and visitors will be invited to assist in the home observation and control, stepping in as the human intelligence driving the smart homes. [Editor's note: *SOMEONE* was installed in 205 Hudson Gallery from February 8, 2019—March 31, 2019, as part of the exhibition, "REFRESH: Refiguring the Future."]
University of California, Los Angeles Casey Reas *Expanded Cinema*	*Expanded Cinema* continues to investigate applications of machine intelligence within the realms of photography.The project proposes to use machine intelligence to produce an ambitious, experimental film that is continuous and non-linear. The film will explore the subjects of quantum mechanics and consciousness through the lens of science, history, and philosophy. [Editor's note: Aspects of this research are reflected in a new publication by Casey Reas: *Making Pictures with Generative Adversarial Networks* (Anteism Books, a non-technical introduction to emerging AI techniques, exploring explores what it's like to make pictures with generative adversarial networks (GANs).]

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Carnegie Mellon University Golan Levin *Extreme Hand Tracking for Audiovisual Virtual Reality*	Hand-tracking refers to sensing algorithms which can infer the positions and identities of fingers. This is an active area of research, with many ready applications in VR, entertainment, spatial user interfaces, and assistive/augmentative communication technologies. The subject of this research project is "finger tutting", a contemporary vernacular dance form that involves fast, intricate, and unusual movements of the fingers. (The name derives from "tutting", a hip-hop dance style based on angular, stylized movements which resemble ancient Egyptian reliefs.) This project proposes a web-based, immersive and augmented "finger tutting" VR experience produced in collaboration with members of the San Francisco Finger Circus and a new OpenPose model for "extreme" hand figurations. While the gestures and language of finger tutting may reside outside the universe of typical UI interactions, this project may produce indirect or incidental benefits for the problem of tracking sign language.
University of California, Los Angeles Casey Reas *Expanded Cinema*	*Expanded Cinema* investigates the applications of machine intelligence within the realms of photography. The project proposes to use machine intelligence to produce an ambitious, experimental film that is continuous and non-linear. The film will explore the subjects of quantum mechanics and consciousness through the lens of science, history, and philosophy.