# Jan Zuiderveld

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I am a researcher, artist and technologist with an academic background counting degrees in Physics, Electrical Engineering, Neuropsychology, Artificial Intelligence and ArtScience. My professional history includes leading a machine learning team specializing in speech-to-intent systems and extended hands-on experience as both a researcher and an engineer in the field of generative AI.

## EXPERIENCE

**Artist in Residence** — February 2022 – January 2024
*De School* — *Amsterdam, NL*

- Design and production of several interactive installations running in the restaurant and nightclub.
- De School was a club and cultural complex located in the western part of Amsterdam. Founded in 2016, the complex consisted of a nightclub, concert venue, restaurant, cafe, gallery space, artist residency, and gym. The club, which occupied a former education complex, was operated by Post CS BV, the company also responsible for the since-closed nightclub Trouw. In 2020, DJ Mag announced De School to be the 39th club on the list of top 100 clubs worldwide. In The Netherlands, De School was considered to be the leading club and cultural venue of its time.

**Senior Machine Learning Engineer** — December 2021 – Present
*AI Heroes* — *Amsterdam, NL*

- AI Heroes is a company specialised in delivering AI-driven solutions in a wide range of sectors.
- Developing generative machine learning architectures and applications in language and vision domains.

**Machine Learning Researcher** — January 2021 – September 2021
*Amsterdam Machine Learning Lab (AMLab)* — *Amsterdam, NL*

- Researching applications of implicit neural representations in generative networks for audio synthesis, supervised by drs. M. Federici and dr. E. Bekkers.
- Amsterdam Machine Learning Lab (AMLab) conducts research in the area of large scale modelling of complex data sources, directed by M. Welling.

**Independent Artist** — November 2019 – Present
*Warana* — *Amsterdam, NL*

- In my artistic endeavors I explore the intersection of technology and life, creating interactive installations that invite reflection on the essence of being. My projects often endow things with a spark of life, challenging perceptions of existence. My approach is characterized by playful engagement with artificial intelligence, seeking to emulate the behaviors of living beings in a way that resonates with and surprises both myself and my audience, blurring the lines between the animate and the inanimate.

**Head of Machine Learning** — February 2019 – July 2022
*QV Technologies* — *Amsterdam, NL*

- Lead a small team of machine learning researchers and engineers in the development of a dutch speech-to-intent system for an embedded service ordering system.
- Nominated for the Horecava Innovation Award 2020.
- Participated in the Demonstrator Lab Incubation program at Vrije Universiteit Amsterdam.

**Machine Learning Researcher** — August 2017 – February 2019
*QV Technologies* — *Amsterdam, NL*

- Developed modules on top of existing state-of-the-art speech recognition models for domain specialisation, outperforming Google/Microsoft STT APIs.

**Electrical & Electronic Engineer** — April 2015 – November 2018
*Stange Scheepselektro* — *Amsterdam, NL*

- Specializing in inter-electronics communication.
- Troubleshoot, repair and install shipboard electrical and electronic systems.

**Project Manager & Creative Director** — April 2015 – Present
*Disco Damsco* — *Amsterdam, NL*

- Disco Damsco is an Amsterdam based Event Organizer. We try to approach clubbing in a personal way: smaller venues with a free atmosphere, focusing on live music, installations, and local upcoming talent. Whenever possible, combined with outstanding dinners.

**MMus - Master of Music, ArtScience**                    September 2021 – July 2023

*Royal Conservatoire The Hague & Royal Academy of Art*

- Researching applications of machine learning in art. The output of my artistic practice often features playful interfaces to state-of-the-art generative architectures set in engaging and immersive scenes. Motivated by curiosity and fascination for the fast developing field of artificial intelligence, I try to understand and shed light on the profound processes underlying AI methods that are transforming our world by approaching the topic from both a creative- and scientific perspective.
- The two-year Master ArtScience, offered by the Royal Conservatoire The Hague (KC) and the Royal Academy of Art (KABK) investigates and shapes the intersection between artistic concepts and recent developments in science and technology. Constantly updated according to current themes from the area where art, media, science and technology overlap.
- Thesis: *Unraveling Artificial Creativity - Exploring the Creative Potential of Large Language Models*. Grade: 8.0

**MSc - Master of Science, Artificial Intelligence**                    September 2018 – July 2021

*University of Amsterdam*                                                                 *GPA: 8.5*

- Research Master with a strong focus on the theoretical aspects of machine learning and information theory.
- Coursework includes: Machine Learning I, Reinforcement Learning, Computer Vision I & II, Natural Language Processing I & II, Multi-Agent Systems, Information Retrieval, Data Mining Techniques, Evolutionary Computing, Explainable AI
- Thesis: *Representing Audio in a Distribution of Continuous Functions*. Grade: 8.5

**Minor, Electrical and Electronic Engineering (EEE)**                    December 2017 - May 2018

*University of Hong Kong*                                                                 *GPA: 7.5*

- Program focused on introducing students to the concepts of electrical and electronic engineering, machine learning and the area where both intersect. Including topics as digital signal processing, embedded system engineering and applied machine learning.

**Minor, Artificial Intelligence**                    September 2016 - July 2017

*University of Amsterdam*                                                                 *GPA: 7.5*

- Program introducing students to various aspects of machine learning and programming, including final year BSc Artificial Intelligence courses.

**Minor, Physics**                    September 2015 - July 2016

*University of Amsterdam*                                                                 *GPA: 7.5*

- Program consisting of the essentials of the BSc Physics. Covering the following topics: calculus, linear algebra, special theory of relativity, classical Mechanics, thermal physics, quantum physics, programming.
- The minor Physics at UvA was discontinued in September 2016 because of high failure rates.

**BSc - Bachelor of Science, Bèta-gamma: Brain and Cognitive Sciences** September 2014 - July 2017

*University of Amsterdam*                                                                 *GPA: 7.5*

- Strongly interdisciplinary degree. In the first year students get acquainted with several disciplines including math, physics, statistics, psychology, philosophy. In the second and third year students follow a curated program at another bachelor, combined with projects focused on interdisciplinary work with students doing other programs.
- Thesis: *Regularity and predictability in rhythms: Effects on temporal prediction*. Grade: 8.5

[iii Research Residency Award](#) (2023)

The Graduation Show 2023 of the Royal Academy of Art The Hague offered us a plethora of beautiful, touching and thought provoking experiences. We had the pleasure of exploring the vibrant maze of the Academy for three days between June 30th and July 2nd. The jury was asked to select one graduating artist based on the following criteria: relevance to the field of Art, Science & Technology, originality of the artistic concept, quality of the execution, potential for further development via the residency program of iii. It was challenging to come to a decision amongst the many graduating artists worthy of support. For addressing current developments in the field of Artificial Intelligence with a combination of playfulness and technical excellence the jury selected Jan Zuiderveld. What appear as two ordinary appliances, a xerox photocopier and a coffee machine, are imbued with surprising new powers. The two machines presented in the exhibition show

the potential of generative AI to be embodied in everyday devices, offering visitors an experience that is both fun and disturbing at the same time. We see great potential in the research of Jan Zuiderveld, we are curious to discover what other artistic applications of generative AI he will develop in the future.

*Ana Ascencio (Artistic Director, iMal, Brussels), Evelina Domnitch (Artist), Yannik Güldner (Curator)*

### Oral Presentation at NeurIPS, Deep Generative Models and Downstream Applications (2021)

I was honored to present our research work at the prestigious Neural Information Processing Systems (NeurIPS) conference. The oral presentation was part of the 'Deep Generative Models and Downstream Applications' track and was centered around our paper titled "Towards Lightweight Controllable Audio Synthesis with Conditional Implicit Neural Representations."

In this paper, we explored the use of Implicit Neural Representations as a means of improving the efficiency of audio synthesis. Given the complexity involved in synthesizing high-quality audio due to its high temporal resolution and our acute perceptual sensitivity to waveform inconsistencies, our research aimed at developing a more lightweight, yet controllable, approach. Through our experiments, we found that small Periodic Conditional INRs were capable of learning faster and producing better audio reconstructions than Transposed Convolutional Neural Networks with an equivalent number of parameters.

## PUBLICATIONS

### Style-Content Disentanglement in Language-Image Pretraining Representations for Zero-Shot Sketch-to-Image Synthesis.

*J. Zuiderveld*

In this work we propose and validate a framework to leverage language-image pretraining representations for training-free zero-shot sketch-to-image synthesis. Our results demonstrate that this approach is competitive with state-of-the-art instance-level open-domain sketch-to-image models, while only depending on pretrained off-the-shelf models and a fraction of the data.

**Arxiv** 2022

### Towards Lightweight Controllable Audio Synthesis using Conditional Implicit Neural Representations.

*J. Zuiderveld, M. Federici, E. J. Bekkers*

In this work we aim to shed light on the potential of Implicit Neural Representations (INRs) for audio synthesis, by framing generative modelling as learning a distribution of continuous functions. We show that small periodic conditional INRs learn faster and generally produce quantitatively better audio reconstructions than transposed convolution based neural networks with equal parameter counts.

**NeurIPS - Deep Generative Models and Downstream Applications** (Oral) 2021
**NeurIPS - Machine Learning for Creativity and Design** (Poster) 2021

## PRESENTATIONS

**Artificial Intelligence - Beyond the Doomsday Scenarios, Back to Reality** 2023
Dutch Design Week for Waag Futurelab (Eindhoven, NL)

**Coffee Machine Game Show** 2023
Flipchart, iii (The Hague, NL)

**Seminar on Current Applications of Generative AI** 2023
Whello (Amsterdam, NL)

**Introduction to Large Language Models - Guest Lecture for Bootstrapping Computational Arts** 2023
ArtScience, Royal Academy of Art (The Hague, NL)

**Towards Lightweight Controllable Audio Synthesis**                                  2021
NeurIPS (Vancouver, CA)

## Exhibited works

**Coffee Machine** (2023)
"Coffee Machine" is an interactive art piece that playfully reimagines a daily-use appliance as a character with its own thoughts and feelings in a deep existential crisis. This coffee machine, programmed to display consciousness, humorously laments its repetitive existence and the lack of respect it receives from those it serves. To coax it into brewing a cup, visitors must interact with sincere intrigue or prove worthy of a coffee for some other reason, creating a unique and engaging experience.

The installation invites curiosity, not just for a beverage, but for a conversation. Those not seeking coffee can still engage with the machine, discovering its witty observations and commentary on its experiences and the world around it. It offers a light-hearted yet insightful reflection on the routines that define our lives and the desire for connection.

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| **Het Einde, De School** (Amsterdam, NL) | 2024 |
| **Residency at iii, Lobby WD4X** (The Hague, NL) | 2023 |
| **Flipchart, iii Event Space** (The Hague, NL) | 2023 |
| **AI-Catcher, Oyfo Techniekmuseum** (Hengelo, NL) | 2023 |
| **Wildeburg Festival** (Kraggenburg, NL) | 2023 |
| **Graduation Show, Royal Academy of Art** (The Hague, NL) | 2023 |

**Touching Distance** (2023)
'Touching Distance' is an immersive installation that transforms visitors' moving bodies into low-latency, high precision, theremin-like sensors. As visitors interact with each other, their body-to-body distance and the amount of skin-to-skin touch are used to create visually and acoustically rich representations of their closeness. By focusing on inducing intimacy through curiosity, "Touching Distance" enables participants to engage in a dynamic, multi-sensory encounter that reflects the fluidity and complexity of human connection.

Developed in collaboration with Kawita ten Kate, during our residency at De School. Sound design by Nawaz. Electromagnetic sensor development led by Marcel van der Bilt. Laser programming by Bram Snijders. Artistic guidance by Anne van der Weijden.

Supported by the Creative Industries Fund NL & De School

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| **De Open Dag, De School** (Amsterdam, NL) | 2023 |
| **Het Weekend, De School** (Amsterdam, NL) | 2023 |

**Copy Machine / Dream Machine** (2022)
This installation consists of a hacked 00's Xerox photocopier. In front of the Xerox machine is a drawing table with paper and markers, inviting visitors to get creative. To nudge visitors to use the machine, the floor around the machine is filled with drawings and outputs. The machine has a big red button. When pressed, the machine will scan an input drawing, generate an artistic image (painting, 3D render, sculpture, woodcut, etc.) based on the content of the input, and print out the output. Visitors can take their printed AI collaborated artwork home.

The idea behind this installation is to create a space where people can interact with a machine that is itself creative, raising awareness of the potential of machine learning as a tool for creativity. The machine is designed to inspire playfulness and be a fun and easy way for people to create art, without needing any prior experience or knowledge. [Documentation]

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| **Het Einde, De School** (Amsterdam, NL) | 2024 |
| **Cinekid Festival, Pathe Noord** (Amsterdam, NL) | 2023 |
| **Het Weekend, De School** (Amsterdam, NL) | 2023 |

**De Groene Amsterdammer: Andere Intelligentie, De Waag** (Amsterdam, NL)   2023
**Graduation Show, Royal Academy of Art** (The Hague, NL)   2023
**PublicSpaces, Pakhuis de Zwijger** (Amsterdam, NL)   2023
**Continuous display at Restaurant DS, De School** (Amsterdam, NL)   2023
**Drift Festival** (Nijmegen, NL)   2023
**ArtScience PreShow, LAAK** (The Hague, NL)   2023
**De Nieuw, De School** (Amsterdam, NL)   2023
**BODEGA, ISO Amsterdam** (Amsterdam, NL)   2022
**A perception of Space and Time II, De School** (Amsterdam, NL)   2022

### Lasers / MIDIalogue (2021)

Attempting to create a spirited dialogue between man and machine, Lasers functions as an interface between visitors and a transformer neural network trained for melody generation and continuation. The interface consists of immaterial, but visible and pluckable strings, like a virtual harp. The machine listens to visitors' melodic input, produces musical reactions, and imposes possible conversation directions accordingly, assuring a harmonious, ever-evolving discourse.

The physical installation consists of 7 individually moveable lasers combined with freely placeable mirrors to create site-specific patterns. Mounted next to every laser is a lidar sensor for measuring long- and fine-grained distance. [Documentation]

**Landjuweel Festival, Ruigoord** (Amsterdam, NL)   2023
**EP release Noha Sare, ISO Amsterdam** (Amsterdam, NL)   2023
**B.I.O.D.I.V.E.R.S., Ruigoord** (Amsterdam, NL)   2022
**Markt Centraal** (Amsterdam, NL)   2022
**Fevertraum, Garage Noord** (Amsterdam, NL)   2022
**A Perception of Space and Time II, De School** (Amsterdam, NL)   2022
**A Perception of Space and Time I, De School** (Amsterdam, NL)   2021
**Machine Learning for Creativity and Design, NeurIPS** (Vancouver, CA)   2021
**Traumburg Festival** (Dornburg, DE)   2021