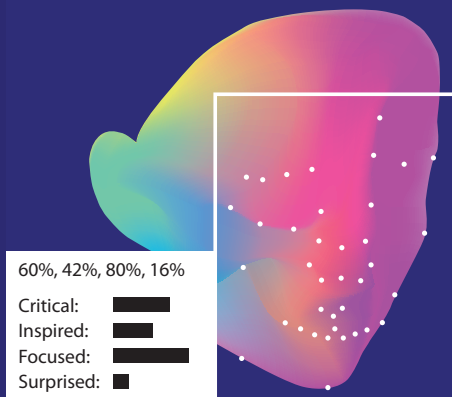


# Machine Vision in Everyday Life

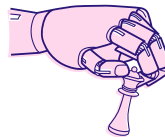
REPORT



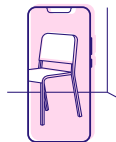
Jill Walker Rettberg  
 Marianne Gunderson  
 Linda Kronman  
 Ragnhild Solberg  
 Gabriele de Seta



Identifying  
 Classifying  
 Detecting



Analysing  
 Scanning  
 Communicating



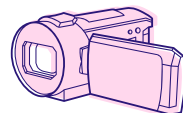
Displaying  
 Informing  
 Revealing



Identifying  
 Scanning  
 Analysing



Scanning  
 Analysing  
 Revealing



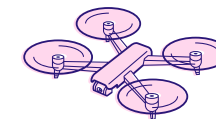
Capturing  
 Recording  
 Revealing



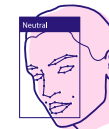
Capturing  
 Recording  
 Hacked



Scanning  
 Revealing  
 Reconstructing



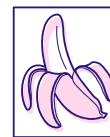
Recording  
 Killing  
 Scanning



Analysing  
 Classifying  
 Detecting



Tracking  
 Detecting  
 Scanning



Classifying  
 Detecting  
 Analysing



Displaying  
 Projecting  
 Communicating



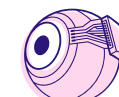
Filtering  
 Overlaying  
 Hiding



Zooming  
 Revealing  
 Targeting



Revealing  
 Scanning  
 Detecting



Informing  
 Displaying  
 Scanning



Capturing  
 Revealing  
 Failing



Generating  
 Learning  
 Visualising



Replacing  
 Generating  
 Altering



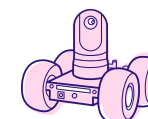
Generating  
 Analysing  
 Learning



Recording  
 Capturing  
 Transmitting



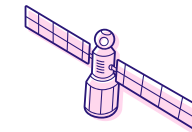
Simulating  
 Generating  
 Showing



Controlled  
 Streaming  
 Revealing



Recording  
 Streaming  
 Surveilling



Revealing  
 Locating  
 Mapping

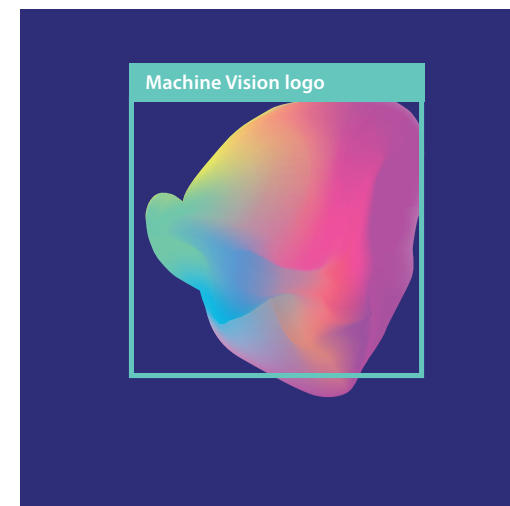
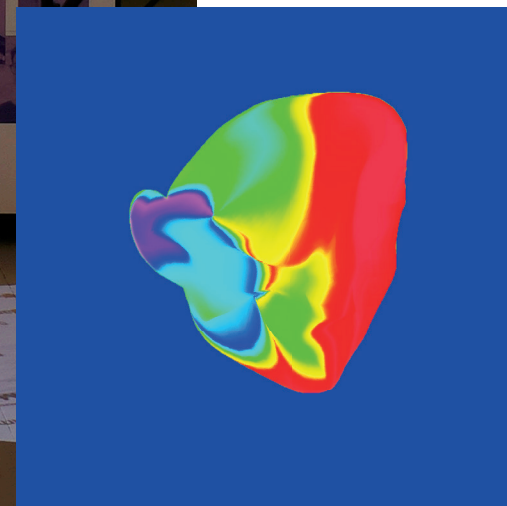
## WHAT MACHINE VISION DOES

## INTRODUCTION

This report presents the main findings of a six-year research project about how everyday machine vision affects the way ordinary people understand themselves and their world. We approach this topic from two main angles: analyses of art, games and narratives about machine vision, and ethnographic research on how people use, promote and respond to machine vision in everyday life.

When we began this research project in 2018, generative AI models were at an early stage of development. Deepfakes were new and strange but not yet easy to create. We used facial recognition to unlock our phones but smart surveillance was rare outside the military. In the six years that have passed, image generation is as easy as typing a prompt into DALL-E or Midjourney, and while smart surveillance is heavily regulated in Europe, in many other countries it is used in schools, supermarkets, neighbourhoods and homes.

In our research, we developed a database of 500 artworks, video games, movies and novels featuring machine vision technologies, and the concept



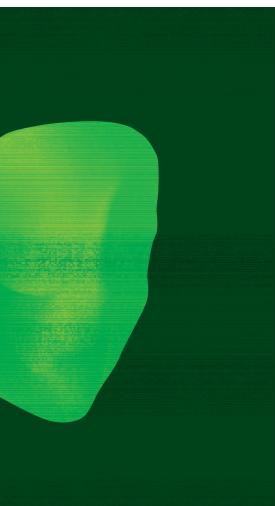
of machine vision situations to analyse these. We published a book, completed three PhD dissertations, and published articles and book chapters about our research. We ran workshops and symposiums both online and offline, and we curated an exhibition and developed a series of live action roleplaying games (larps) to explore the topic in more speculative and collaborative ways. This report presents a summary of our project's methods, findings, and outputs.

We hope this report inspires researchers to use and build upon our work, whether this means using or adapting the analytical model we developed, using our findings and concepts, or exploring more collaborative and creative approaches to humanities research.

## CONTENTS

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The research project Machine Vision in Everyday Life: Playful Interactions with Visual Technologies in Digital Art, Games, Narratives and Social Media ran from 01.08.2018-31.07.2024 and was funded by a ERC Consolidator Grant from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (grant agreement No 771800). The project also received funding from the Norwegian Research Council (project no. 309711). It was hosted at the University of Bergen's Department of Literary, Linguistic and Aesthetic Studies, and from July 2023 the team joined the Center for Digital Narrative, a Norwegian Centre of Research Excellence at the University of Bergen funded by the Norwegian Research Council from 2023-2033 (project no. 332643).



# OVERVIEW OF THE MACHINE VISION IN EVERYDAY LIFE PROJECT

## OBJECTIVE

Understanding how the algorithmic machine vision of the 21st century affects the way ordinary people see themselves and understand the world.

## RESEARCH QUESTION 1

Which kinds of agencies develop and which are limited in the interactions between individual users and machine vision?

## RESEARCH QUESTION 2

Does the experience of being able to manipulate the visual as data through everyday interaction with machine vision lead us to see the world and ourselves as malleable?

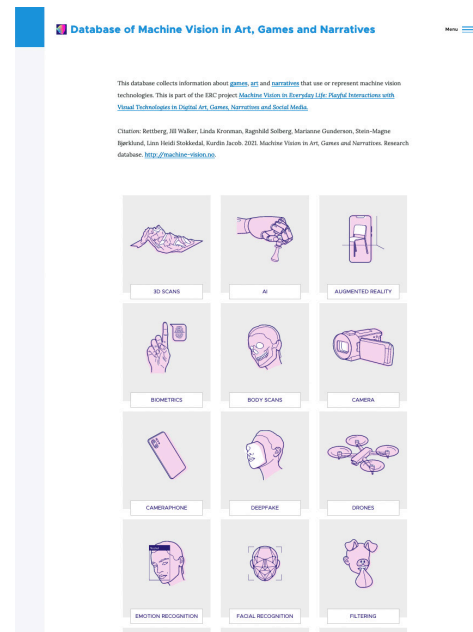
## RESEARCH QUESTION 3

Which values are embedded in machine vision, and which biases are introduced or supported?

## OUTPUTS

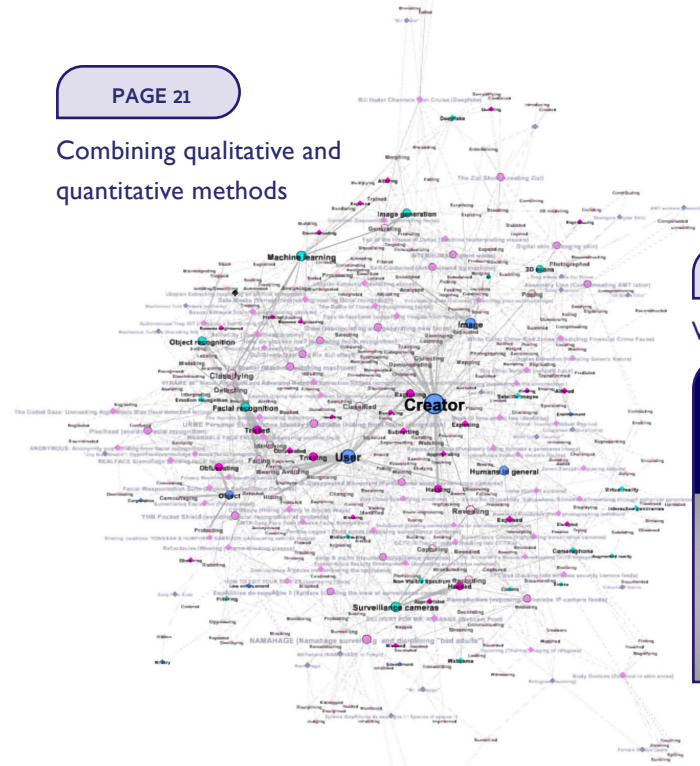
### Machine Vision Database

PAGES 18-20



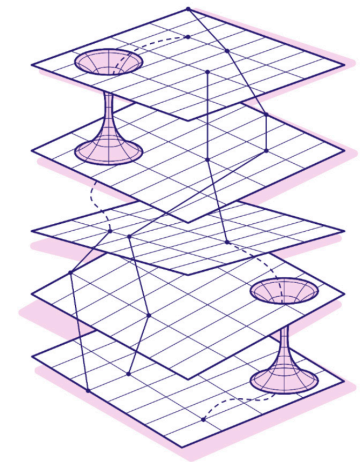
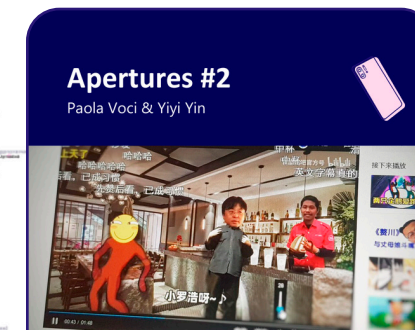
PAGE 21

Combining qualitative and quantitative methods



PAGE 24-25

Workshops and Seminars



PAGES 26-29

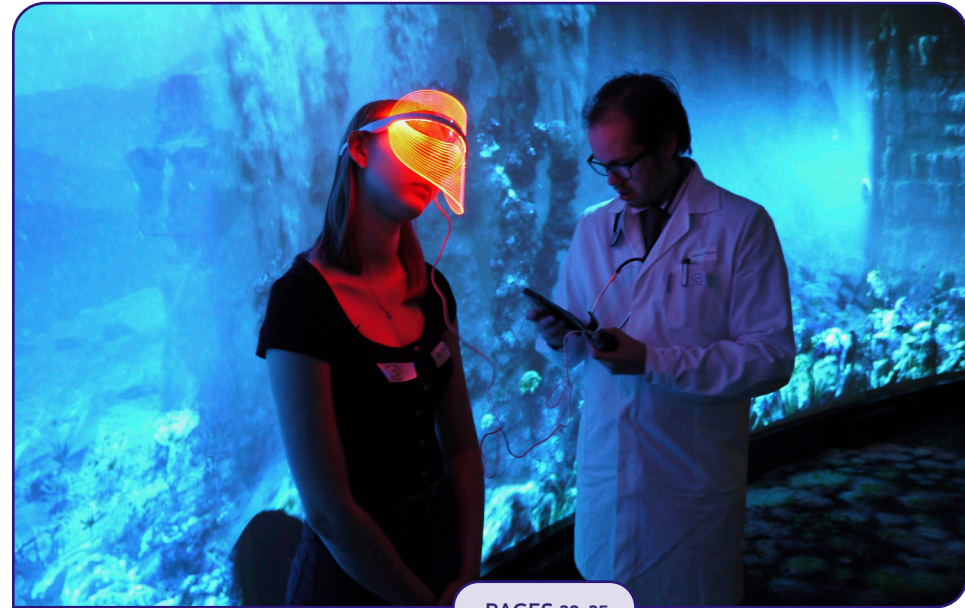
Concepts

CREATIVE PRACTICE



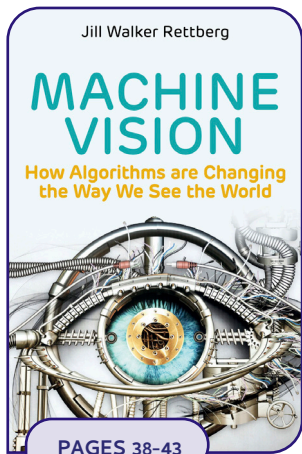
Machine Vision Exhibition

PAGES 30-31

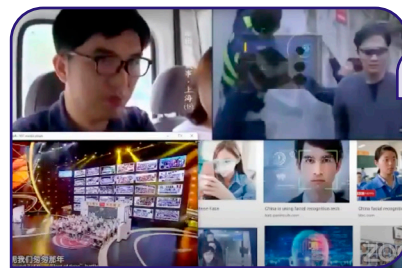


Live action roleplaying games (Larps)

PAGES 32-35



Publications



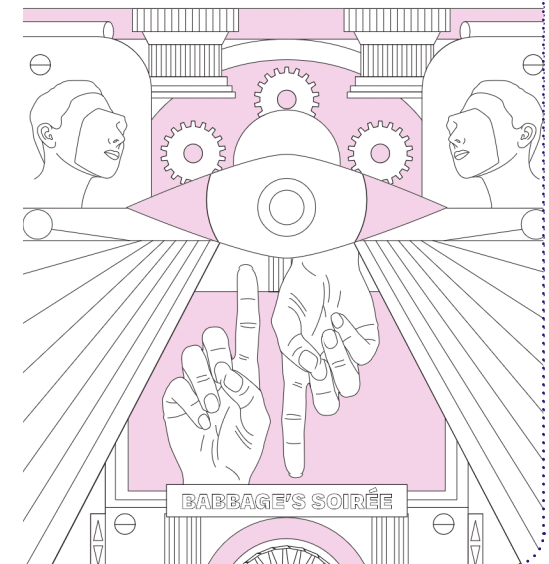
Art practice

PAGES 22,35-37



Photo: © esc medien kunst labor, CYBORGSUBJECTS, by Martin Gross.

CONVERSATION CARDS



## ABOUT THE MACHINE VISION TEAM

Photo: Eivind Senneset/UiB



- Speculating
- Analysing
- Theorising
- PI
- Database
- Exhibition
- Larp
- Apertures
- Special issue

**JILL WALKER RETTBERG** was the Principal Investigator of the Machine Vision project. She is Professor of Digital Culture at the University of Bergen, and co-director of the Center for Digital Narrative, which is a Norwegian Centre of Research Excellence funded by the Norwegian Research Council from 2023-2033. Jill launched a new ERC Advanced Grant project in 2024 called AI STORIES: Narrative Archetypes for Generative AI, which tests the hypothesis that deep narrative structures in the data generative AI is trained causes narrative biases in the output of these models. Jill's books include a scholarly anthology on the game World of Warcraft (MIT Press 2008), *Blogging* (Polity Press 2008/2014), *Seeing Ourselves Through Technology* (Palgrave 2014) and the book that came out of the Machine Vision project: *Machine Vision: How Algorithms are Changing the Way We See the World* (Polity Press 2023). Her research blog is at [jilltxt.net](http://jilltxt.net).

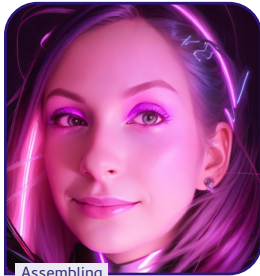
Photo: Eivind Senneset/UiB



- Theorising
- Imagining
- Straying
- Narratives
- Database
- Larp
- Exhibition
- Special issue

**MARIANNE GUNDERSON** is a researcher and lecturer in Digital Culture at the University of Bergen. She has an MA in Gender Studies from the University of Oslo and has previously published on the rewriting of gender in omegaverse fanfiction and posthuman monsters in Weird fiction. As a PhD fellow with the Machine Vision Project, she used a combination of close reading and digital methods to study how algorithms and machine vision are envisioned in science fiction and popular culture. During the project, Marianne has worked on developing the machine vision situations framework and produced papers on dystopian imaginaries of augmented reality, monstrous figurations of smart home assistants, and the experience of 'feeling seen' by the TikTok algorithm.

AI enhanced



- Assembling
- Visualising
- Creating
- Art
- Database
- Exhibition
- Apertures
- Special issue
- Art practice
- Report layout

**LINDA KRONMAN** is a media artist, researcher and designer from Finland. She holds a PhD on digital art from the University of Bergen, and an MA in New Media from Aalto University, Finland. Since 2010 she has created art as a part of the Kairus collective exploring the use and abuse of technologies. Through a research-led art practice she has addressed topics such as data privacy and security, AI ethics, activism and hacking culture, disruptive art practices, critical making, electronic waste, and the materiality of the Internet. In 2019 Linda joined the Machine Vision project as a PhD researcher studying how machine vision biases are conceptualized in digital art. By combining methods from digital humanities with artistic methodologies Linda's PhD research explores ways art can help us think differently about AI.

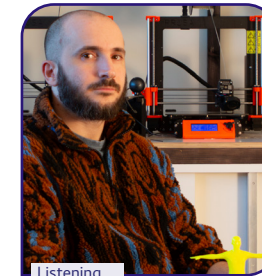
Photo: Eivind Senneset/UiB



- Playing
- Critiquing
- Embodying
- Games
- Database
- Exhibition

**RAGNHILD SOLBERG** has a PhD in digital games from the University of Bergen, and is a lecturer in Digital Culture at the University of Bergen. She has previously worked as a lecturer at NTNU. She was originally trained as a high school teacher, and taught English, Norwegian, and Psychology for several years before pursuing digital game research. During the project, Ragnhild published research on game representations of surveillance, embodiment and technology, non-human agencies, and hegemony and ideology. Her current research is on the relationship between marginalized identities and power in digital games.

Photo: Silver Carlsson



- Listening
- Practicing
- Situating
- Ethnography
- Database
- Exhibition
- Larp
- Apertures
- Special issue
- Art practice

**GABRIELE DE SETA** is, technically, a sociologist. He is a Researcher at the University of Bergen, where he leads the ALGOFOLK project ("Algorithmic folklore: The mutual shaping of vernacular creativity and automation") funded by a Trond Mohn Foundation Starting Grant (2024-2028). He holds a PhD from the Hong Kong Polytechnic University and was a Postdoctoral Fellow at the Institute of Ethnology, Academia Sinica in Taipei. Gabriele joined the Machine Vision project as a Postdoctoral Researcher in early 2020, with a focus on the role of machine vision in Chinese everyday life. During the four years he spent with the project, he has conducted ethnographic research in Hong Kong, Taiwan and on the internet, publishing articles on topics including deepfakes, QR codes, and the Chinese AI industry.

# ACKNOWLEDGEMENTS

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Jenny Ostrop (open science)  
And many others at LLE and UiB

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Maren Knudsen  
Overhaus  
Linda Kronman

## EXHIBITION

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Marit Kjeksrud Amundsen (Project leader)  
Åshild Sunde Feyling Thorsen (Curator)  
Mattias Arvastsson (IT/AV-technician)  
Jan Ellertsen (It/av assistance)  
Sølve Westli, Reece Whitehead (Technicians)  
Aisha Marie Heim (Host coordinator)  
All the knowledge-hosts

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Dan Stavv  
Eran Weissenstern  
James Bridle  
Leo Selvaggio  
Joy Buolamwini  
Kairus  
Weiyi Li

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Andreas Zingerle (Co-curator, Senior Advisor)  
Linda Kronman, Gabriele de Seta (Project coordinators, Machine Vision Team)

## PARTICIPANTS

Thank you to all  
the participants in  
our workshops,  
symposiums and larps.

## OLJH SPECIAL ISSUE

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## MAIN FINDINGS

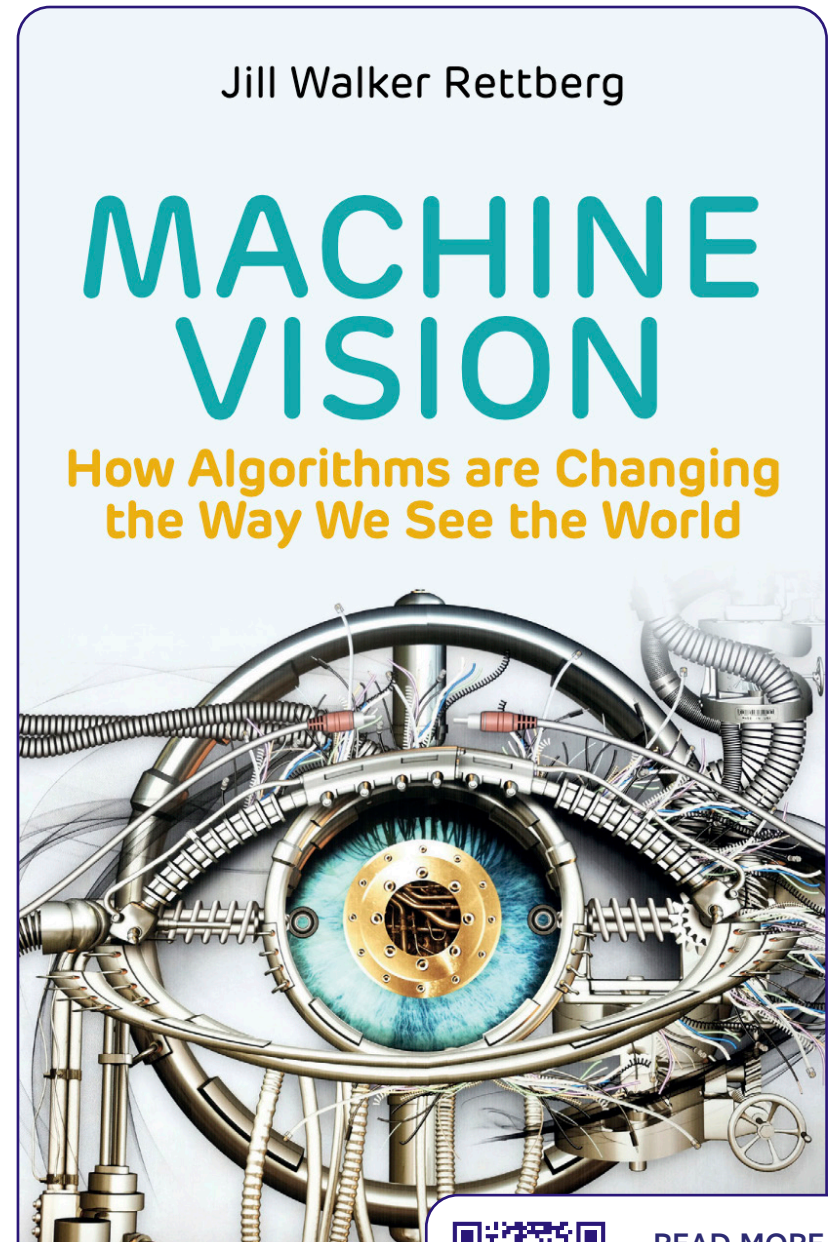
Our research shows that machine vision is **more than a technology**. It is **actively imagined**, **contextually situated**, and **historically complex**. Machine vision is not only about seeing – it **does things**, and it is **biased at every level**. Despite the prevalence of dystopic stories where machine vision is used to oppress humans, we also see that machine vision is **constantly negotiated**, opening up a potential for change. We expand on these findings in the pages that follow.

### READ MORE IN DOCTORAL DISSERTATIONS:

Gunderson, Marianne. Forthcoming. 'The Nexus of Algorithmic Visions: Agency, Imaginaries, and the Self in Sociotechnical Situations'. Doctoral thesis, The University of Bergen.

Kronman, Linda. 2024. 'Performing Bias : Conceptions of Machine Vision Bias in Digital Art'. Doctoral thesis, The University of Bergen. <https://bora.uib.no/bora-xmlui/handle/11250/3126415>.

Solberg, Ragnhild. 2023. 'Playing Posthumanism : A Study of Machine Vision and Tensions of Human-Machine Relations in Digital Games'. Doctoral thesis, The University of Bergen. <https://bora.uib.no/bora-xmlui/handle/11250/3039103>.



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## MACHINE VISION IS MORE THAN A TECHNOLOGY

Machine vision is not just technology. It occurs in the interactions between **technology**, **imaginaries**, and **context**. This means that biases and impacts must be analysed across these domains. Machine vision technologies are machines, software and algorithms that register, analyse, process and represent visual information. Generative AI and facial and object recognition are the most discussed new kinds of machine vision, but they are part of a longer history of technological development and imagined ideas about what technology could do that stretches back for millenia.

### READ MORE

Gunderson, Marianne, Ragnhild Solberg, Linda Kronman, Gabriele de Seta, and Jill Walker Rettberg. 2023. 'Machine Vision Situations: Tracing Distributed Agency'. *Open Research Europe* 3 (August):132. <https://doi.org/10.12688/openreseurope.16112.1>.

Rettberg, Jill Walker. 2023. *Machine Vision: How Algorithms Are Changing the Way We See the World*. Cambridge: Polity Press.



AI enhanced

## MACHINE VISION IS ACTIVELY IMAGINED

Imagination is a key part of both the development and use of machine vision. On the one hand, technical research is driven by the long-standing dream of creating machines that are able to see. On the other hand, vision machines are narrated, promoted and critiqued through artworks, games, stories, conversations, memes and other aesthetic and communal forms of expression. These machine vision imaginaries don't simply respond to new technologies: they have material effects. Imaginaries drive technology and actively shape it.

### READ MORE

de Seta, Gabriele, and Anya Shchetvina. 2023. 'Imagining Machine Vision: Four Visual Registers from the Chinese AI Industry'. *AI & SOCIETY*, August. <https://doi.org/10.1007/s00146-023-01733-x>.

Gunderson, Marianne, Ragnhild Solberg, Linda Kronman, Gabriele de Seta, and Jill Walker Rettberg. 2023. 'Machine Vision Situations: Tracing Distributed Agency'. *Open Research Europe* 3 (August):132. <https://doi.org/10.12688/openreseurope.16112.1>.

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Solberg, Ragnhild. 2021. 'Hologrammer i Grenseland: Ikke-menneskelige Aktørers Tilstedeværelse Og Handlingsrom i Spill [Holograms in the Borderlands: Non-Human Presence and Agency in Games]'. *Norsk Medietidsskrift* 28 (4): 1–20. <https://doi.org/10.18261/issn.0805-9535-2021-04-03>.



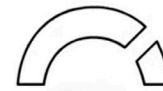
## MACHINE VISION IS CONTEXTUALLY SITUATED

Machine vision technologies are always situated in specific contexts (cultural, geographical, socio-economic, political, professional) which impact how they are developed, used and represented. Through our data analyses and case studies, we consistently found evidence of this **situatedness** of machine vision, which offers a productive counterpoint to the essentialist and determinist claims that are often made about technology.

This is also a source for hope. If technologies change in different contexts, that means that by changing the context, we can change the technology.



## SITUATED DATA ANALYSIS



which helps us see through the God trick



WATCH ON  
 YouTube

### READ MORE

de Seta, Gabriele, and Anya Shchetvina. 2023. 'Imagining Machine Vision: Four Visual Registers from the Chinese AI Industry'. *AI & SOCIETY*, August. <https://doi.org/10.1007/s00146-023-01733-x>.

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Rettberg, Jill Walker. 2020. 'Situated Data Analysis: A New Method for Analysing Encoded Power Relationships in Social Media Platforms and Apps'. *Humanities and Social Sciences Communications* 7 (1): 5. <https://doi.org/10.1057/s41599-020-0495-3>.

## WHAT TECHNOLOGIES DO IN THE MACHINE VISION DATABASE



MORE ABOUT  
DRONES  
THAT KILL



### MACHINE VISION DOES THINGS

In its interactions with humans, machines, and other actors, machine vision does things. The inclusion of machine vision in a situation makes a difference in the way events unfold. Machine vision technologies interpret information, create images, and generate meanings, but their agential capacities also go beyond the visual sphere. Depending on the context, machine vision can be seen to contribute to actions such as killing (in drone warfare),

driving (a driverless car), or playing (digital games). As part of surveillance assemblages, machine vision can channel or reinforce power structures, and intimately affect our movements and habits in our everyday lives. Although we may imagine that we are in control and that these technologies are mere tools for human intentions, this idea is undermined by our own depictions of them in games, art, and narratives.

READ MORE

Gunderson, Marianne, Ragnhild Solberg, Linda Kronman, Gabriele de Seta, and Jill Walker Rettberg. 2023. 'Machine Vision Situations: Tracing Distributed Agency'. Open Research Europe 3 (August):132. <https://doi.org/10.12688/openreseurope.16112.1>.

Solberg, Ragnhild. 2022. "Too Easy" or "Too Much"? (Re)Imagining Protagonistic Enhancement through Machine Vision in Video Games'. Przegład Kulturoznawczy, no. 4 (54) (December), 548–69. <https://doi.org/10.4467/20843860PK.22.037.17091>.

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Kronman, Linda. 2020. 'Intuition Machines: Cognizers in Complex Human-Technical Assemblages'. A Peer-Reviewed Journal About 9 (1): 54–68. <https://doi.org/10.7146/aprja.v9i1.121489>.



MORE VISUALISATIONS ON:  
TRICKING AI

## MACHINE VISION IS HISTORICALLY COMPLEX

Machine vision is shaped by complex histories, which influence not only how different technologies are developed and used, but also how broader understandings of visual sensing and automation are configured by different actors. By keeping in mind the importance of the past, we have sought to anchor our analyses of different machine vision technologies in overlooked histories and forgotten genealogies, which allowed us to challenge the future-oriented rhetoric that pervades current discourses around artificial intelligence.

### READ MORE

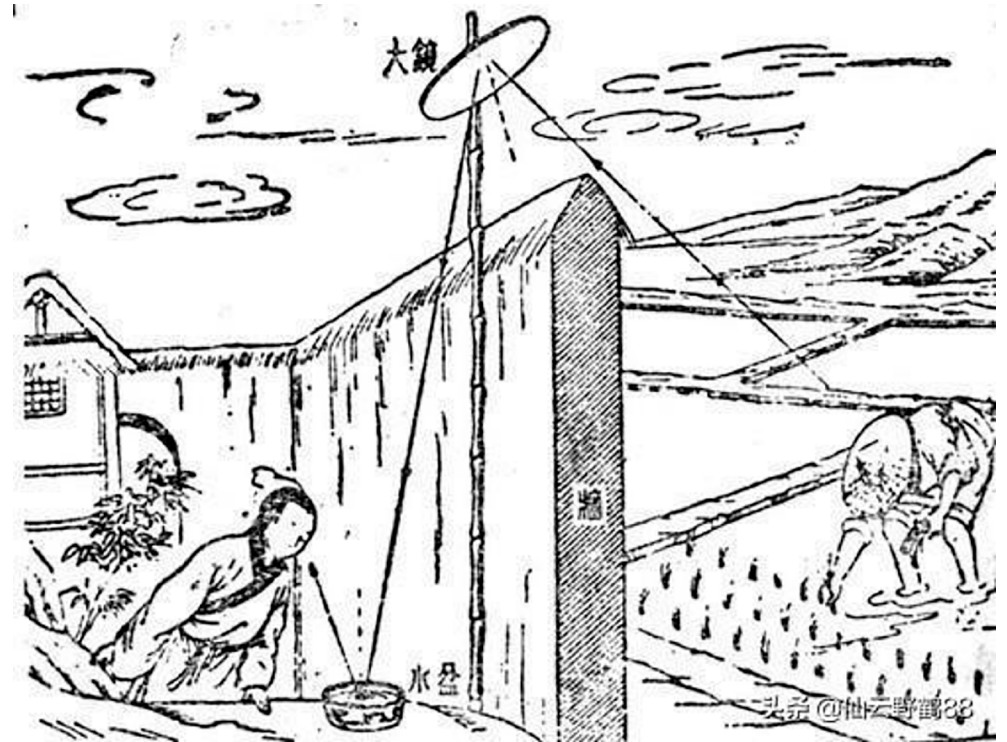
de Seta, Gabriele. 2024. 'Technologies of Clairvoyance: Chinese Lineages and Mythologies of Machine Vision'. In *Machine Decision Is Not Final: China and the History and Future of AI*, edited by Benjamin Bratton, Anna Greenspan, and Bogna Konior. SI. Cambridge, Massachusetts: MIT Press.

Rettberg, Jill Walker. 2023. *Machine Vision: How Algorithms Are Changing the Way We See the World*. Cambridge: Polity Press.



### BABBAGE'S SOIRÉES (SEE PAGE 34)

a live action roleplaying game set in 1840 that explores social and cultural influences on early machine vision technologies.



## MACHINE VISION IS BIASED AT EVERY LEVEL

Creative works witness and reflect the impacts of machine vision on society. They influence our perceptions of what machine vision technologies are and can do. If we look at all creative works in the database, machine vision technologies are most often represented as helpful. However, in contrast to games and narratives, art most often depicts machine vision as flawed and only rarely as helpful. Artworks, along with other creative works in the database, reveal that machine vision is biased at every level.

Machine learners talk about bias as a necessity, something that needs to be added to a model to predict accurately on new data. In contrast, in AI ethics, bias stands for discrimination, misjudgment, and misrepresentation. Particularly, artworks point out the flaws in current AI systems, showing that biases emerge throughout an AI's lifecycle: historical biases amplify societal prejudices, representation biases occur when datasets underrepresent certain populations or overrepresent harmful stereotypes, and label biases arise when image datasets are categorized and annotated. Machine learning algorithms further homogenize any existing diversity in datasets, and the negative impacts of machine vision technologies extend to the extraction of natural resources, labor exploitation, and nonconsensual use of data. As many researchers have argued, AI-powered machine vision repeats patterns of colonial history: the powerful gain, whereas those already marginalized by society experience the harms. By showing that technologies are neither less biased nor superior to humans in solving problems deeply rooted in societal structures, creative works can help us think differently about mitigating biases, going beyond merely adding diversity to datasets or implementing other technical fixes.

### READ MORE

Kronman, Linda. 2024. 'Performing Bias : Conceptions of Machine Vision Bias in Digital Art.' Doctoral thesis, The University of Bergen. <https://bora.uib.no/bora-xmlui/handle/11250/3126415>.

Rettberg, Jill Walker. 2022. 'Algorithmic Failure as a Humanities Methodology: Machine Learning's Mispredictions Identify Rich Cases for Qualitative Analysis.' *Big Data & Society* 9, no. 2 <https://doi.org/10.1177/20539517221131290>.

## SENTIMENTS RECORDING ATTITUDES TOWARD MACHINE VISION IN THE DATABASE

### ART



### GAMES



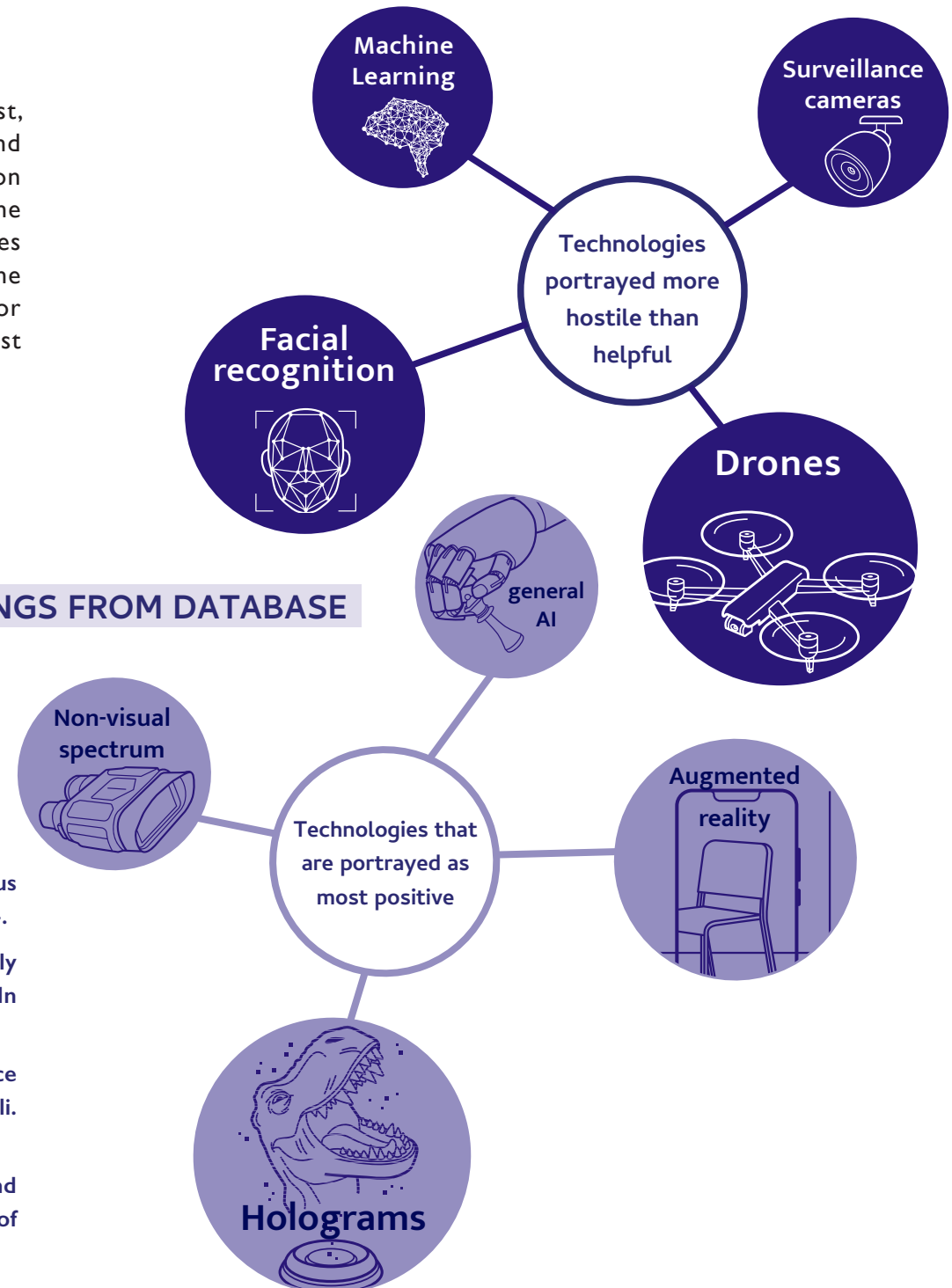
### NARRATIVES



## MACHINE VISION IS CONSTANTLY NEGOTIATED

Machine vision is something we constantly negotiate, evaluate, resist, appropriate, hack, trick, dispute and adopt. Science fiction shows and video games do some of this work by imagining how machine vision technologies could work or should work. Artists show us how machine vision technologies might fail us or oppress us or inspire us. Companies pitch new machine vision technologies in ads and on websites, and online communities respond by writing online horror stories about them or sharing strategies for repurposing the technologies or getting the most out of them or fooling them.

### FINDINGS FROM DATABASE



#### READ MORE

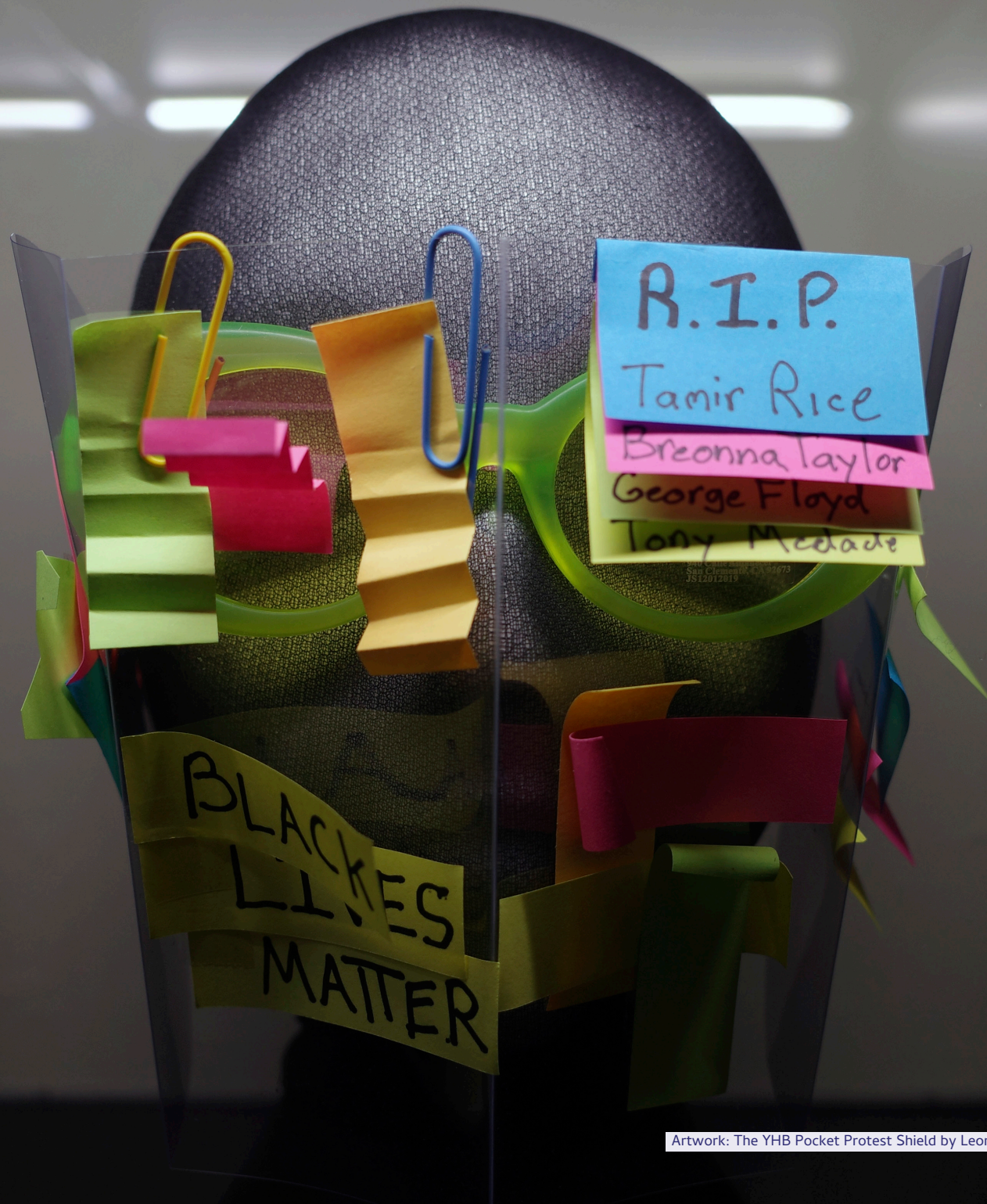
Atalaia, Nuno, and Marianne Gunderson. Forthcoming. 'Alexa's Monstrous Agency: The Horror of the Digital Voice Assistant.' In review, June 2024.

Gunderson, Marianne. Forthcoming. 'The Tiktok Algorithm Knows Exactly What I Like. I Feel Seen': Imaginaries of Algorithmic Self-Perception. In review, June 2024.

Rettberg, Jill Walker. 2024. 'Controlling Drones in Contemporary Science Fiction'. In *Drones in Society: New Visual Aesthetics*, edited by Elisa Serafinelli. Basingstoke: Palgrave. [https://doi.org/10.1007/978-3-031-56984-5\\_2](https://doi.org/10.1007/978-3-031-56984-5_2)

Kronman, Linda. 2023. 'Hacking Surveillance Cameras, Tricking AI and Disputing Biases: Artistic Critiques of Machine Vision'. *Open Library of Humanities Journal* 9 (2). <https://doi.org/10.16995/olh.10181>.



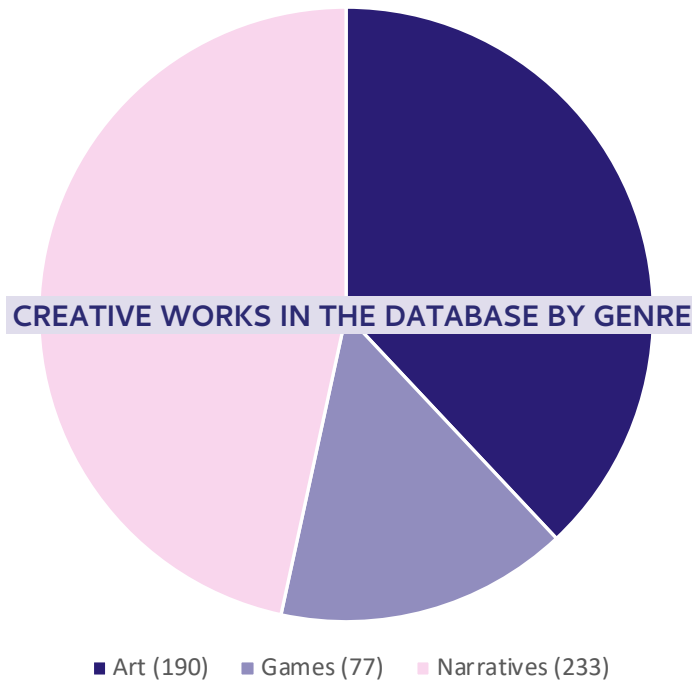


Artwork: The YHB Pocket Protest Shield by Leonardo Selvaggio. Photo: Gabriele de Seta.4.0

# METHODS

## DATABASE

The database includes 500 creative works that use or represent machine vision technologies. In the various works we identified 874 specific situations where machine vision is central. The concept 'machine vision situations,' is inspired by posthumanist and feminist new materialist theories, and was developed to describe the actions of human and non-human agents, including machine vision technologies. We have published a dataset exported from the database that will be useful for humanities and social science scholars interested in the relationship between technology and culture, and for designers, artists, and scientists developing machine vision technologies.



### Creative Work (500)

## DATABASE STRUCTURE

**Suspicious Behavior**

**Description (in English)**  
Machine vision technologies, such as object recognition, facial recognition and motion detection, are increasingly used to train images and algorithms, that in turn make predictions and inferences. In the past years these technologies have made rapid advances in accuracy. The reasons for current developments are the arrival of more accurate labeling methods leading from streaming data, access to massive amounts of data to train neural networks, and increased processing power.

This notably causes excitement among technologists who are implementing these technologies in the world of automated surveillance and machine vision technologies are developed to spot suspicious behavior without human supervision. As in all pattern recognition applications for there is to translate images into behavior and data. Machine vision technologies for object detection technologies consider that it is easy for computers to extract meaning out of images and render our bodies into binary code, yet trial and error approaches have already revealed that our bodies are not so easy for machines to interpret. Human bodies are embedded in machine learning systems throughout the process of recognizing a situation as suspicious, labeling and creating training data.

What is considered suspicious is not defined context might be normal in another. Hence, developers admit, "It's challenging to teach this information to machines/bots". However, for machine learning to develop "smarter" models to detect abnormal behavior to detect and prevent possible actions.

**Fields:** Year, Creator, Country, Publication Type, Technologies referenced or used, Topics, Sentiment, Characters, Description

### Character (778)

**Annotator (Suspicious Behavior)**

**Age:** Adult  
**Species:** Human  
**Gender:** Unknown  
**Race/Ethnicity:** Unknown  
**Individual or group?:** Individual  
**Customizable:** Not customizable

**Description:**  
The user of the artwork is given the role of a image annotator (crowdworker) who is labeling videos for machine learning purposes.

**Works the character appears in:**

Title	Publication Type	Year
Suspicious Behavior	Art, Online art	2020

**Fields:** Age, Species, Gender, Race/ethnicity, Individual or group?, Customizable?

### Machine Vision Situation (874)

**Suspicious Behavior (labeling images)**

**Brief description**  
In this artwork the user becomes part of the AI pipeline taking the role of a underpaid crowdworker annotating images for machine learning purposes. The task is to decide if a situation is suspicious or not. The client (corporation) is giving certain guidelines of what authorities define as suspicious based on this the annotator needs to do quick interpretation relying rather on intuition than reflection. The annotator is told that the images will be used to train machines to detect suspicious behavior.

**Who does what?**  
This character  
[Annotator \(Suspicious Behavior\)](#)  
Is  
[Labeling](#)  
[Classifying](#) ← **Classifying**  
[Interpreting](#)  
[Deciding](#)  
[Guided](#)

This technology  
[Machine learning](#)  
[Surveillance cameras](#)  
Is  
[Trained](#)  
[Detecting](#)  
[Analysing](#)  
[Developed](#)  
[Classifying](#) ← **Classifying**

This entity  
[Corporation](#)  
is/are  
[Categorising](#)  
[Guiding](#)  
[Outsourcing](#)  
[Controlling](#)  
[Training](#)

This entity  
[Image](#)  
is/are  
[Labeled](#)  
[Interpreted](#)  
[Classified](#) ← **Classified**

This entity  
[Humans in general](#)  
is/are  
[Classified](#) ← **Classified**  
[Analysed](#)

**Work that the situation appears in**

Title	Publication Type	Year	Creator
<a href="#">Suspicious Behavior</a>	<a href="#">Art, Online art</a>	2020	<a href="#">KairUs</a>

**Screenshots or images**

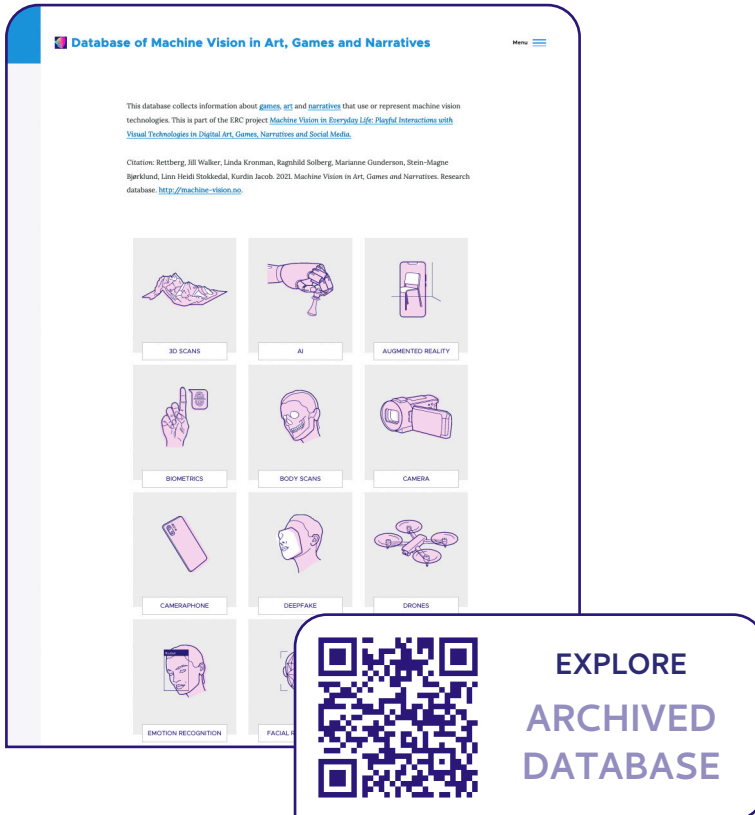
**Technology (26)**  
Fixed vocabulary: 3D scans, AI, Augmented reality, Biometrics, Body scans, Camera, Cameraphone, Deepfake, Drones, Emotion recognition, Facial recognition, Filtering, Hologram, Image generation, Interactive panoramas, Machine learning, Microscope/Telescope, Motion tracking, Non-visible spectrum, Object recognition, Ocular implant, Satellite images, Surveillance camera, UGV, Virtual reality, Webcams.

**Entity (10)**  
Fixed vocabulary: Corporation, Creator, Environment, Government, Humans in general, Image, Law enforcement, Military, Object, User.

**Verbs**  
Open vocabulary 1104 unique verbs

## MACHINE VISION SITUATIONS

Machine vision technologies must be understood within the specific context in which they are put to use. What a specific technology can be said to do, whether in fiction or reality, can only be determined by attending to the actual situation in which it can be said to make a difference. For this purpose we developed the framework of the machine vision situation, defined as the moment in which machine vision technologies come into play and make a difference in the course of events. Within this framework, we use simple verbs to identify and describe the actions of the agents - technologies, characters, and other human or nonhuman entities - that are involved in the situation. This framework formed the basis for both the database and our qualitative analyses of the agency of machine vision.



Database of Machine Vision in Art, Games and Narratives

This database collects information about **games**, **art** and **narratives** that use or represent machine vision technologies. This is part of the ERC project **Machine Vision in Everyday Life: Playful Interactions with Visual Technologies in Digital Art, Games, Narratives and Social Media**.

Citation: Rettberg, Jill Walker, Linda Kronman, Ragnhild Solberg, Marianne Gunderson, Stein-Magne Bjørklund, Linn Heidi Stokkedal, Kurdin Jacob. 2022. Machine Vision in Art, Games and Narratives. Research database: <http://machine-vision.no>.

3D SCANS AI AUGMENTED REALITY

BIOMETRICS BODY SCANS CAMERA

CAMERAPHONE DEEPPAINT DRONES

EMOTION RECOGNITION FACIAL

EXPLORE ARCHIVED DATABASE

## MACHINE VISION SITUATIONS

Gunderson, Marianne, Ragnhild Solberg, Linda Kronman, Gabriele de Seta, and Jill Walker Rettberg. 2023. 'Machine Vision Situations: Tracing Distributed Agency'. *Open Research Europe* 3 (August):132. <https://doi.org/10.12688/openreseurope.16112.1>.

## PUBLISHED DATASET

Rettberg, Jill Walker, Linda Kronman, Ragnhild Solberg, Marianne Gunderson, Stein Magne Bjørklund, Linn Heidi Stokkedal, Gabriele de Seta, Kurdin Jacob, and Annette Markham. 2022. 'Representations of Machine Vision Technologies in Artworks, Games and Narratives: Documentation of a Dataset'. *Data in Brief* 42. <https://doi.org/10.1016/j.dib.2022.108319>.

## MORE ABOUT THE DATA

Rettberg, Jill Walker, Linda Kronman, Ragnhild Solberg, Marianne Gunderson, Stein Magne Bjørklund, Linn Heidi Stokkedal, Gabriele de Seta, Kurdin Jacob, and Annette Markham. "A Dataset Documenting Representations of Machine Vision Technologies in Artworks, Games and Narratives." *DataverseNO*, 2022. <https://doi.org/10.18710/2G0XKN>.

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algorithmic failure  
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WATCH ON  
YouTube

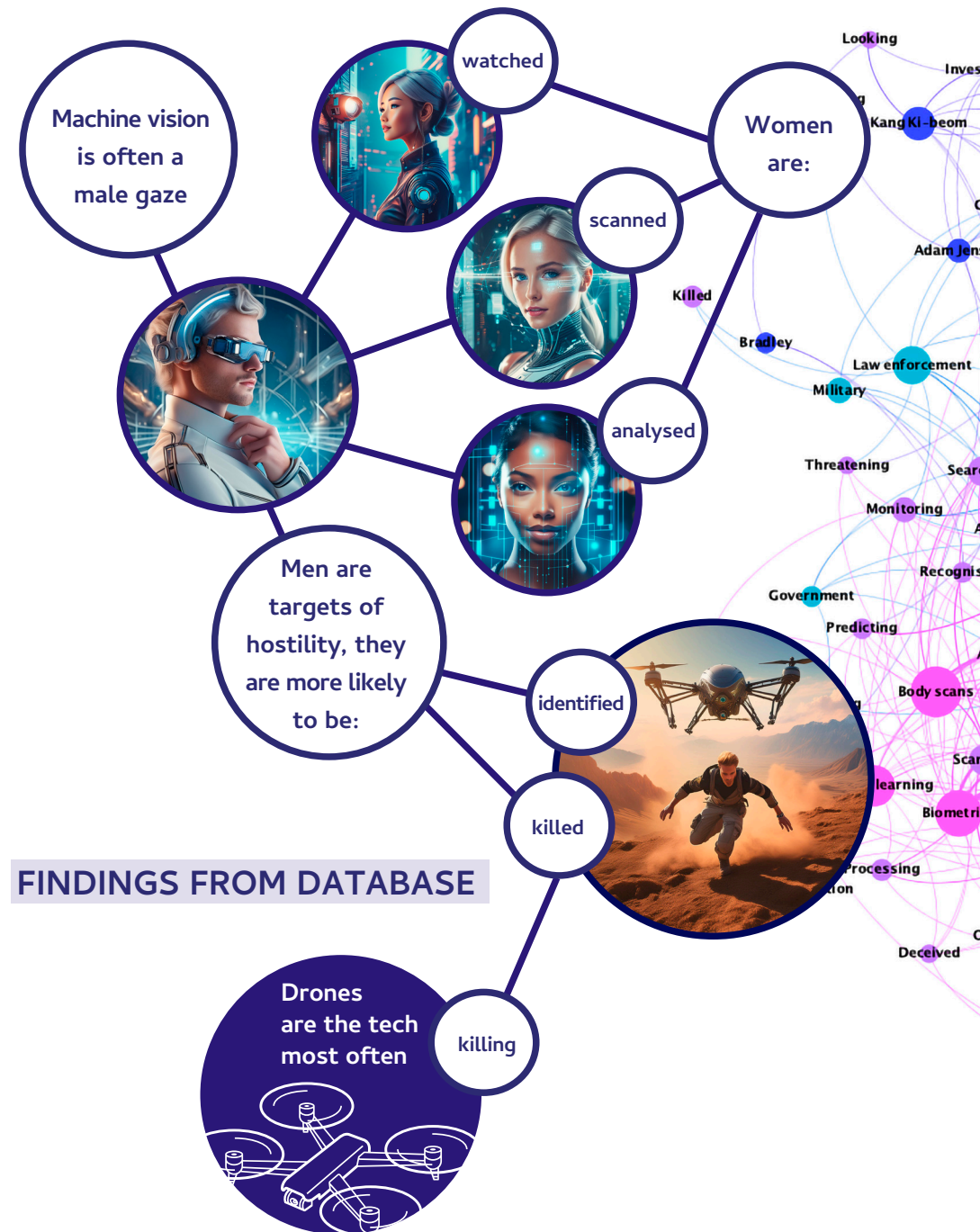
EXAMPLES OF ANALYSES USING THE DATASET

Rettberg, Jill Walker. 2024. 'Controlling Drones in Contemporary Science Fiction'. In *Drones in Society: New Visual Aesthetics*, edited by Elisa Serafinelli. Basingstoke: Palgrave. [https://doi.org/10.1007/978-3-031-56984-5\\_2](https://doi.org/10.1007/978-3-031-56984-5_2)

Kronman, Linda. 2023. 'Hacking Surveillance Cameras, Tricking AI and Disputing Biases: Artistic Critiques of Machine Vision'. *Open Library of Humanities Journal* 9 (2). <https://doi.org/10.16995/olh.10181>.

Kronman, Linda. 2023. 'Classifying Humans: The Indirect Reverse Operativity of Machine Vision'. *Photographies* 16 (2): 263–89. <https://doi.org/10.1080/17540763.2023.2189160>.

Rettberg, Jill Walker. 2022. 'Algorithmic Failure as a Humanities Methodology: Machine Learning's Mispredictions Identify Rich Cases for Qualitative Analysis'. *Big Data & Society* 9 (2): 20539517221131290. <https://doi.org/10.1177/20539517221131290>.





## ETHNOGRAPHY

To understand how machine vision technologies are used in everyday life, we also conducted ethnographic research in different contexts ranging from cities like Taipei, Hong Kong and Chicago to digital spaces such as social media and online communities. Through participant observation, interviews and qualitative data collection, ethnographic research has allowed us to triangulate our analyses of creative works with the everyday use of machine vision technologies. For example, Jill Walker Rettberg has traced the role of neighborhood surveillance infrastructure in Chicago, connecting it to the city's past history and present politics, while Gabriele de Seta has documented the social practices of Chinese deepfake creators gathering on specific video streaming platforms. We have also adopted an ethnographic sensibility by, for example, analysing videogames or other interactive cultural works from the point of view of the player (Ragnhild Solberg), or by developing toolboxes of qualitative and participatory research methods for the study of generative AI models (Gabriele de Seta, Linda Kronman).

### READ MORE

Rettberg, Jill Walker 'Seeing Everything: Surveillance and the Desire for Objectivity and Security'. 2023. In *Machine Vision: How Algorithms Are Changing the Way We See the World*. Cambridge: Polity Press.

de Seta, Gabriele. 2021. 'Huanlian, or Changing Faces: Deepfakes on Chinese Digital Media Platforms'. *Convergence* 27 (4): 935–53. <https://doi.org/10.1177/13548565211030185>.

## SUSPICIOUS BEHAVIOR

Kronman, Linda. 2023. 'Classifying Humans: The Indirect Reverse Operativity of Machine Vision'. *Photographies* 16 (2): 263–89. <https://doi.org/10.1080/17540763.2023.2189160>.

Kronman, Linda, and Andreas Zingerle. 2022. 'Suspicious Behavior: A Fictional Annotation Tutorial'. In *Nordic Human-Computer Interaction Conference, 1–3. NordiCHI '22*. New York, NY, USA: Association for Computing Machinery. <https://doi.org/10.1145/3546155.3547288>.

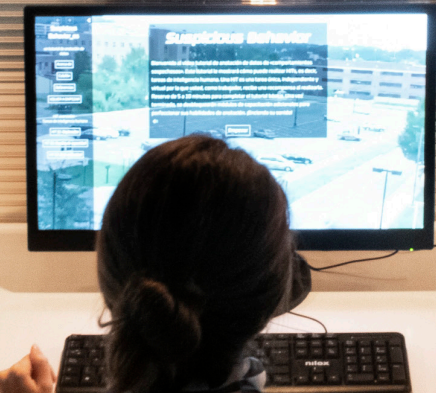
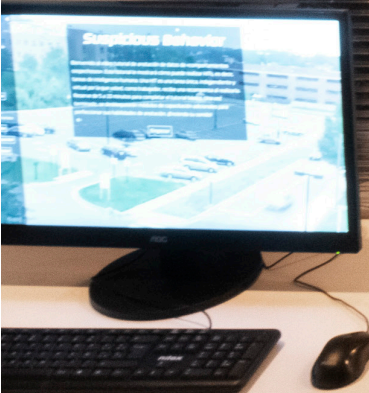
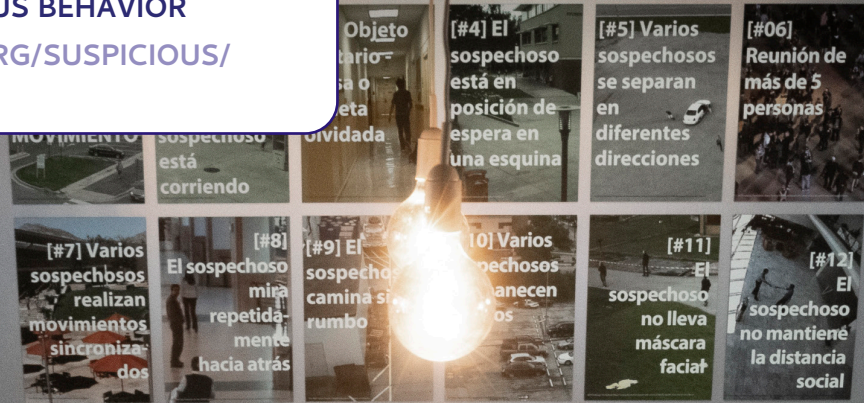
## ARTISTIC RESEARCH

Creative practice has played an important role in the Machine Vision Project (see pages 30-35). Beyond disseminating research and combining digital humanities methods with critical making of art, the project has also involved artistic research. As part of her PhD research, Linda Kronman collaborated with Andreas Zingerle to create **Suspicious Behavior**, a speculative annotation tutorial. By engaging with this digital narrative, the reader can experience aspects of working as a clickworker labelling images for machine learning. The narrative offers a fresh perspective to critical dataset studies by highlighting the often invisible labour behind AI. In doing so, the artwork challenges the assumption that machine vision is neutral or less biased than human perception, particularly in surveillance where racial profiling is replaced by behavioural profiling without clear criteria for defining anomalies. A study into annotation interfaces and workflows of visual datasets revealed that biases are introduced into datasets in iterative loops involving both human and machine interpretation of images. Typically, the biases of individual crowd-sourced annotators have been seen as the main source of bias in datasets. However, artistic research for Suspicious Behavior supports findings that data curators hold significant power over image interpretation. This power that data curators wield in defining categories is obfuscated by the instructive annotation interface.

The first (English) version of Suspicious Behavior was commissioned by esc medien kunst labor, Graz (Austria) for the CYBORG SUBJECTS exhibition 27th of may to 24th of July.



PLAY SUSPICIOUS BEHAVIOR  
[HTTPS://KAIRUS.ORG/SUSPICIOUS/](https://kairus.org/suspicious/)



## WORKSHOPS AND SEMINARS

We presented our research at many scientific conferences and workshops including the annual conferences of the International Symposium of Electronic Art, Association of Internet Researchers, Transmediale, Norwegian Artificial Intelligence Research Consortium (NORA), Theorizing the Web, xCoAx – Conference on Computation, Communication, Aesthetics & X, the Society for Psychological Anthropology, ARTECH, the Electronic Literature Organization, ACM Hypertext and Social Media, Visual Computing Forum, NordMedia, NORDICHI, International Conference Series on the Histories of Media Art, Science and Technology, DIGRA, SLSAeu, Politics of the Machine, Art Meets Radical Openness festival and more.

### Project workshops:

**Kickoff at Solstrand 05-06.11.2018:** Jill Walker Rettberg (UiB), Anne Karhio (UiB/NUI Galway), Tonje Sørensen (UiB), Scott Rettberg (UiB), Chris Ingraham (UiB/University of Utah), Maud Ceuterick (UiB), Linn Heidi Stokkedal (UiB), Jeremy Welsh (NTNU), Elizabeth Losh (William and Mary, USA), Rob Tovey (Loughborough University, UK), Annette Markham (Aarhus University, Denmark), Anna Nacher (Jagellonian University, Poland), Mette-Marie Zacher Sørensen (Aarhus University, Denmark), Katrin Tiidenberg (Tallin University, Estonia), Richard Carter (University of York, UK), Asko Lehmuskallio (Tampere University).

**“The Future Histories of Machine Vision”** was a followup workshop held at **Media City Bergen 01-02.04.2019**. Participants: Jill Walker Rettberg (UiB), Anne Karhio (UiB/NUI Galway), Tonje Sørensen (UiB), Scott Rettberg (UiB), Chris Ingraham (UiB), Maud Ceuterick (UiB), Ragnhild Solberg (UiB), Linda Kronman (UiB), Linn Heidi Stokkedal (UiB), Jeremy Welsh (NTNU), Marianne Gunderson (UiB), Liz Losh (William and Mary, USA), Rob Tovey (Loughborough University, UK), Annette Markham (Aarhus University, Denmark), Anna Nacher (Jagellonian University, Poland), Richard Carter (University of York, UK), Asko Lehmuskallio (Tampere University).

The pandemic forced us to cancel other planned workshops, but we were active online, switching to Zoom and VR meeting spaces.



READ MORE IN JILL WALKER RETTBERG'S BLOG  
VR NARRATIVES: A WORKSHOP IN VR, ABOUT VR



READ MORE IN GABRIELE DE SETA'S BLOG  
SEEING LIKE A STATE OF EXCEPTION

### Machine Vision Data Sprint, Solstrand 15-17.08.2022

In addition to the project team, the following scholars participated: Tyne Daile Sumner (University of Melbourne, Australia), Rianne Riemens (Radboud University Nijmegen, Netherlands), Nuno Atalaia (Radboud University Nijmegen, Netherlands), Fiona Andreallo (RMIT University, Australia), Frazer Heritage (Birmingham City University), David Grellscheid (UiB), Tom Van Hout (Tilburg University, Netherlands), Matti Pohjonen (University of Helsinki), Isak Engdahl (Lund University), Maria Schreiber (University of Salzburg), Anya Shchetvina (Maastricht University), Flourish Klink (Independent, Fansplaining podcast), Nick Montfort (UiB), Jason Nelson (UiB), Kristian Bjørkelo (UiB), Maud Ceuterick (UiB), Daniel Jung (UiB), Scott Rettberg (UiB).

**Art, AI and Machine Vision at University of Bergen, 12.01.2023** with presentations from Nicolas Malevé, Audrey Samson and Jill Walker Rettberg.



**Apertures** was a series of seminars organized by the Machine Vision in Everyday Life research project in 2021. These one-hour video seminars featured talks by invited scholars and artists.

**15.03.2021 Apertures #1: Ari Larissa Heinrich & Dino Ge Zhang**  
(Moderated by Gabriele de Seta)  
Contagious media, medical representations and their afterlives in China.

**28.04.2021 Apertures #2: Paola Voci & Yiyi Yin**  
(Moderated by Gabriele de Seta)  
Chinese screen cultures, digital video platforms and algorithmic fandom.

**10.05.2021 Apertures #3: The “Machine Vision” exhibition vernissage**  
Opening and introducing of the Machine Vision exhibition to international audiences. With Artists Mushon Zer-Aviv, Weiyi Li, Nicolas Zembashi, Leonardo Selvaggio, KairUs members Linda Kronman and Andreas Zingerle, and project curator Åshild Sunde Feyling Thorsen.

**02.06.2021 Apertures #4: Datasets with Caroline Sindere & Toril Johannesse**  
(Moderated by Linda Kronman)  
The labour of assembling datasets for machine learning.

**15.06.2021 Apertures #5: Alexa Hagerty, Shazeda Ahmed & Vidushi Marda**  
(Moderated by Gabriele de Seta)  
Emotion recognition technologies.



## CONCEPTS

### DISTRIBUTED AGENCY

Agency is at the heart of debates about machine vision, and is central to science fiction, games and art. People yearn to be able to do more by using machine vision, but fear being controlled or misled by it. We used posthumanist and feminist new materialist theories of distributed agency to analyse this tension. Technology doesn't simply remove or increase human agency, rather it forces us to acknowledge that we share agency with other people, other species, with technologies, regulations, social contexts, traditions and more. In addition to theoretical development and analyses of specific cases we developed an analytical model focused on the machine vision situation that enables a focus on this collaborative and mutually responsive assemblage (See page 19).

#### READ MORE

Gunderson, Marianne. Forthcoming. 'The Nexus of Algorithmic Visions: Agency, Imaginaries, and the Self in Sociotechnical Situations'. Doctoral thesis, The University of Bergen.

Gunderson, Marianne, Ragnhild Solberg, Linda Kronman, Gabriele de Seta, and Jill Walker Rettberg. 2023. 'Machine Vision Situations: Tracing Distributed Agency'. *Open Research Europe* 3 (August):132. <https://doi.org/10.12688/openreseurope.16112.1>.

Rettberg, Jill Walker. 2023. *Machine Vision: How Algorithms Are Changing the Way We See the World*. Cambridge: Polity Press.

Solberg, Ragnhild. 2022. "'Too Easy' or 'Too Much'? (Re)Imagining Protagonistic Enhancement through Machine Vision in Video Games'. *Przegląd Kulturoznawczy*, no. 4 (54) (December), 548–69. <https://doi.org/10.4467/20843860PK.22.037.17091>.





#### PROMPT

artificial intelligence, and its wide range of applications - which include QR code scanners, biometric access points, image analysis services, surveillance cameras, automated vehicles, and more

## MACHINE VISION IMAGINARIES

Machine vision is a very broad domain of artificial intelligence, and its wide range of applications - which include QR code scanners, biometric access points, image analysis services, surveillance cameras, automated vehicles, and more - reveals the complexity of this technological field. It is not surprising that researchers, tech companies, governments and users rely on various forms of imagination to make sense of machine vision's complexity. Alongside concepts like myth, belief, fantasy or ideology, imaginary has been widely used in social and cultural analyses to encompass the relationship between imagination and technology. More specifically, the concept of “sociotechnical imaginary” (originally proposed by Sheila Jasanoff and Sang-Hyun Kim in 2009) has been applied to countless innovations, industries and practices ranging from nuclear power and data mining to smart cities and surveillance. In this project, we consistently encountered a sociotechnical imaginary of machine vision emerging from the interaction between corporate narratives, governance frameworks, science-fictional tropes, and user beliefs. This machine vision imaginary proved to be constantly shifting, as utopian rhetorics make their way into public debate and policy-making through popular culture and artistic critiques.

READ MORE

de Seta, Gabriele, and Anya Shchetvina. 2023. 'Imaging Machine Vision: Four Visual Registers from the Chinese AI Industry'. *AI & SOCIETY*, August. <https://doi.org/10.1007/s00146-023-01733-x>.

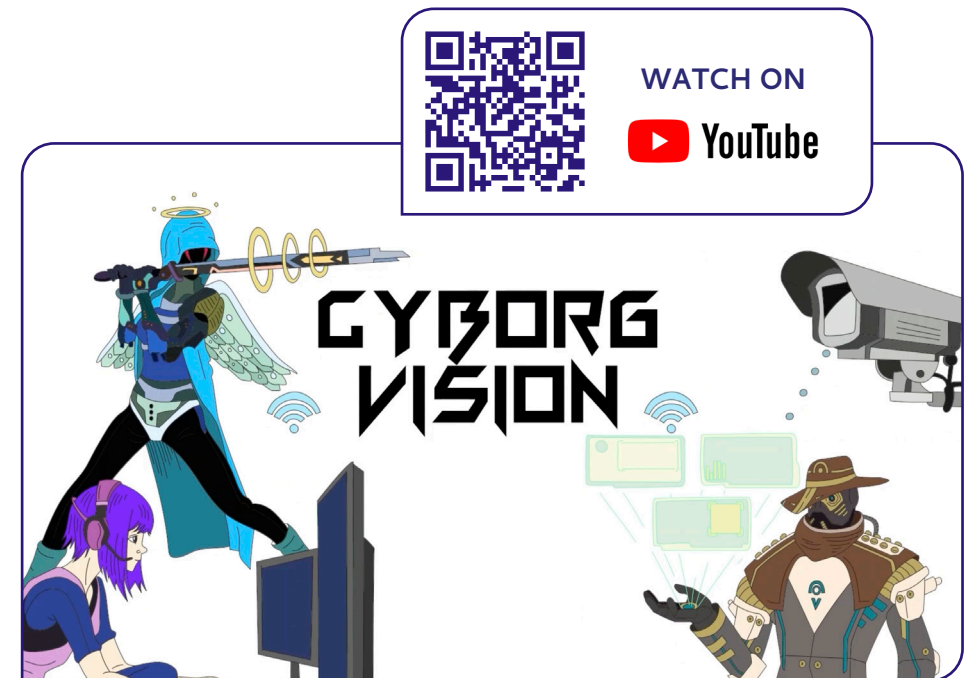
## CYBORG VISION

Seeing the world through a camera lens might seem removed from our human bodies. Our vision merges with the interface, enhancing what we look at and hiding what we look with. Digital games show us that these perspectives are firmly embodied and that we can inhabit multiple human and non-human perspectives at once. Cyborg vision is a partial embodied vision, seeing both as a human and as a machine at the same time. It is a concept that reinstates the body when vision is presented as detached. Inspired by Donna Haraway's understanding of the cyborg, cyborg vision draws attention to the contexts of the human and non-human agents that constitute unique parts of this shared vision. Through cyborg vision, digital games offer an embodied experience of partiality that is going to be increasingly relevant in the future as we outsource more perceptual capabilities and agencies to the machines around us. Cyborg vision is a generative term in exploring human and non-human agencies within, between, and outside of the realm of digital games.

READ MORE

Solberg, Ragnhild. 2022. '(Always) Playing the Camera: Cyborg Vision and Embodied Surveillance in Digital Games'. *Surveillance & Society* 20 (2). <https://doi.org/10.24908/ss.v20i2.14517>.

“A SIMULTANEOUSLY HUMAN AND  
NON-HUMAN VISION THAT’S  
PLURALISTIC YET SITUATED”



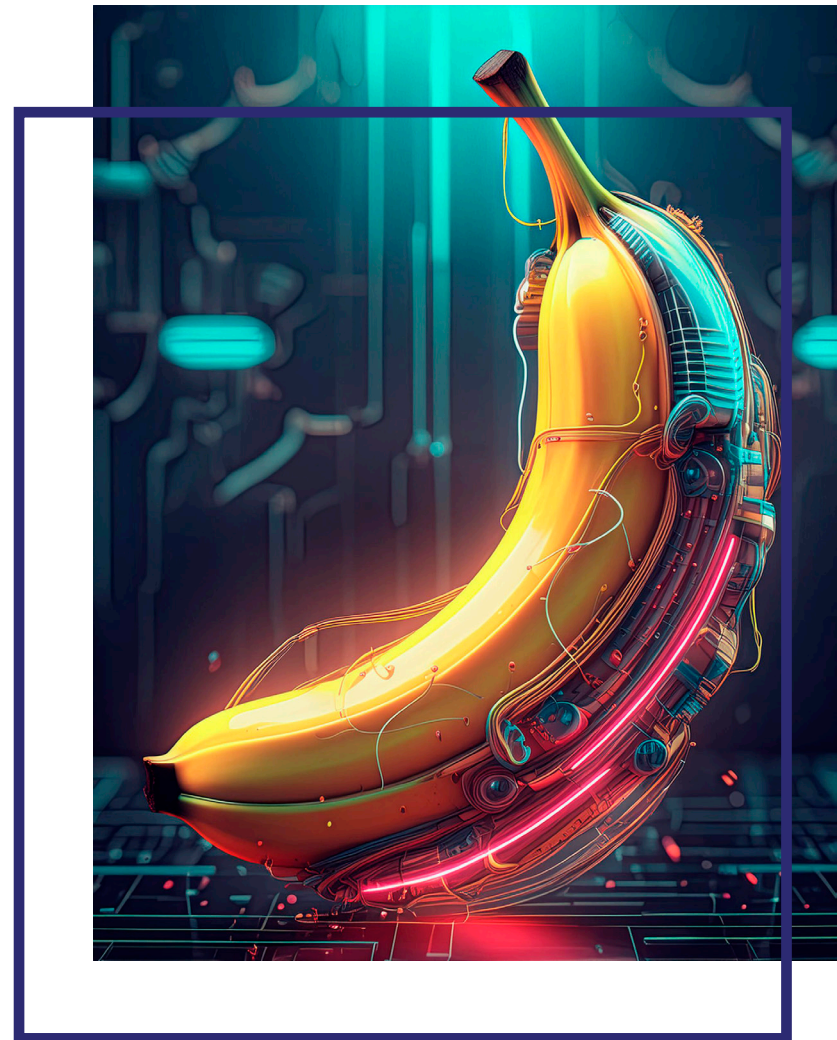
## INTUITION MACHINES AND TECHNICAL INTUITION

Intuition machines is a term to describe the externalisation of human intuitive processing to machine vision. Automation of vision comes with assumptions that machines are less biased and more effective than humans. However, machines are influenced by how humans train them to perceive the world. Using the term intuition underscores that different types of biases are ingrained in what N. Katherine Hayle's coins as 'nonconscious cognitive' machine vision systems. Intuition machines produce technical intuition taking the form of e.g. AI generated images or probabilistic predictions like 82% banana. The notion of intuition machines was developed through a study of artworks in which technical intuitions emerged from an interplay of both human and machine intuition. Like human intuitions, technical intuitions function as an interface between the otherwise non accessible nonconscious and higher-level conscious cognition. Acknowledging that technical devices are capable of certain levels of cognition makes it crucial to critically engage with technical intuitions as they embed potentially harmful biases. Intuition machines also introduce new ways of interacting with technologies. For example in the context of art-hacks, traditional hardware hacking tactics are replaced by methods of tricking AI.

“AS INTUITION MACHINES ARE MAKING DECISIONS WITH US AND FOR US IT BECOMES CRUCIAL TO ASK: HOW DO THESE MACHINES PERCEIVE THE WORLD?”

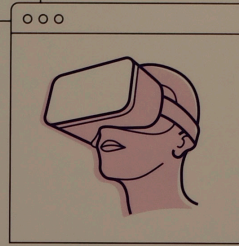
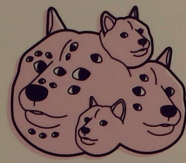
READ MORE

Kronman, Linda. 2020. 'Intuition Machines: Cognizers in Complex Human-Technical Assemblages'. *A Peer-Reviewed Journal About* 9 (1): 54–68. <https://doi.org/10.7146/aprja.v9i1.121489>.

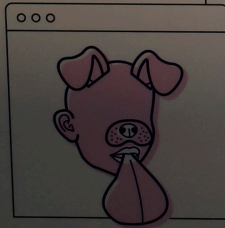


82% banana

# Machine Vision in Everyday Life



Maskinar som ser, finst overalt kring oss, og maskinsyn er sentralt for teknologiar vi bruker kvar dag. Frå mikrokamera til satellittar hjelper synsmaskinar oss med å skanne strekkodar, låse opp mobilar, tagge feriebilete, få nøyaktige diagnoser og finne fram på ein ukjend stad. Samstundes utfordrar automatiseringa av syn etablerte strukturar og skikkar og gjer oss høve til overvaking og kontroll som vi aldri før har sett. Denne utstillinga syner det ERC-finansierte forskingsprosjektet *Machine Vision in Everyday Life*, som kartlegg innverknaden av maskinsyn på tre nivå: *individuell*, *sosialt* og på *verdsnivå*. Korleis ser maskinar oss som individ? Kva endringar fører synsmaskinar til i samfunnet? Og kva slags verder gjer maskinsynsteknologiar moglege?



ENG Machines that see are all around us, and machine vision is central to technologies we use every day. From microcameras to satellites, vision machines help us to scan barcodes, unlock our smartphones, tag our holiday pictures, get accurate diagnoses, and find our way in an unknown place. At the same time, the automation of vision challenges established structures and customs, enabling unprecedented possibilities for surveillance, policing and control. This exhibition showcases the ERC-funded research project *Machine Vision in Everyday Life*, which explores the impact of machine vision on individuals, society and the world.

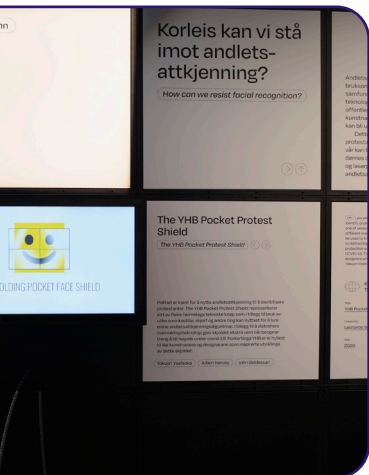


Photos by Gabriele de Seta, University of Bergen

# CREATIVE PRACTICE EXHIBITION

In 2019, the ERC project Machine Vision received additional funding from the Norwegian Research Council's FORSTERK program to support the societal impact of Horizon 2020-funded research projects in Norway. Thanks to this funding, and in collaboration with the University Museum of Bergen, the project developed an exhibition titled "Machine Vision" which opened to the public from March 19th to August 28th, 2021. The "Machine Vision" exhibition was designed as an experiment in science communication combining academic research, contemporary art and critical thinking about new technologies.

When entering the "Machine Vision" exhibition, visitors could experience an experiential labyrinth structured around a series of ethical challenges. The main goal of the exhibition was to increase the public's knowledge of machine vision technologies (including, for example, face recognition, object detection and autonomous cars) and their societal implications. Visitors were able to familiarize themselves with the basic concepts of machine vision, explore the research project's findings, and interact with thought-provoking artworks.



## Featured artworks:

The Battle of Ilovaik by Forensic architecture

The Normalizing Machine by Mushon Zer-Aviv, Dan Stav, Eran Weissenstern

Cloud Index by James Bridle

YHB Pocket Protest Shield by Leo Selvaggio

Al ain't I a woman? by Joy Buolamwini

Suspicious Behavior by Kairus (Linda Kronman and Andreas Zingerle)

The Ongoing Moment by Weiyi Li

## LIVE ACTION ROLEPLAYING GAMES (LARPS)

In 2020 we started developing a series of larps to disseminate our research and explore new speculative methodologies. We received extra funding from the Norwegian Research Council's FORSTERK program for this work, and were able to hire experienced larp developers to help.

**Sivilisasjonens venterom** (21-23 November 2021) was a three day event with 40 participants, where around half were researchers and half were experienced larpers. This was set in a post-apocalyptic future where a small society known as Sivilisasjonen ("The Civilisation") is run by a benevolent AI that uses extensive surveillance to regulate society. The larp begins as a group of refugees from the desolate wastelands arrives at Sivilisasjonen and is processed for possible citizenship. The goal of the larp was to explore ethical questions arising in the tension between experiencing machine vision as protective yet oppressive. The creative lead for the project was veteran larp developer Anita Myhre Andersen, working with Harald Misje, Jon Andreas Edland, Toril Mjelva Saatvedt, Sebastian Sjøvold and Eskil Mjelva Saatvedt. One of the participants, Malthe Stavning Erslav, wrote a scholarly article about the larp, which was also presented at several conferences. Marianne Gunderson was the lead from the research team, with Jill Walker Rettberg and Gabriele de Seta.

### READ MORE

Kristian A. Bjørkelo, Jill Walker Rettberg, Marianne Gunderson, and Gabriele de Seta. 2022. 'Surveillance Imaginaries: Live action role-playing for exploring ethical attitudes towards machine vision and surveillance' DIGRA 2022, Kraków, Poland. 7-11 July, 2022.

Erslev, Malthe Stavning. 2022. 'A Mimetic Method: Rendering Artificial Intelligence Imaginaries through Enactment. 'A Peer-Reviewed Journal About II, no. 1: 34-49. <https://doi.org/10.7146/aprja.v1i1.134305>.



The chamber larp **Ettersynsing** was developed by MA student Jon Andreas Edland, and was run at a national Norwegian conference for AI researchers, NORA, on 17 November 2021, in addition to with groups of students.

**Mønsterakademiet** was a shorter larp set in the same universe as *Sivilisasjonens venterom* to test out concepts. It ran in 2021.

The Bergen-based company **Tidsreiser** developed a children's larp for 10-14 year olds, also exploring ethical issues around surveillance and machine vision. Around 50 children participated in these larps, and Tidsreiser has continued to develop the fictional world they created. The larps ran in 2021 and 2022.







**Babbage's Soirées** is a larp for 20-50 people that is set in 1840 at one of Charles Babbage's 'scientific soirées'. Players take roles as scientists, artists, authors, politicians and inventors who actually attended these soirées. The goal is to explore how new technologies – like the stereoscope, early photography and early computers – are collectively imagined, discussed, displayed, promoted and revised. Babbage's Soirées is still being developed, with three runs in 2024: as part of a BA level course on the history of technology, for researchers at the Center for Digital Narrative, and at ECSITE 2024, a conference for science engagement professionals. This larp was developed by Jill Walker Rettberg with support from Lotte Lisa Devoldere and Marianne Gunderson, and development will continue in 2024 and 2025.



## Henry Fox Talbot

**GROUP:** Media technology  
**AGE IN 1840:** 40  
**CLASS:** Upper class  
**NATIONALITY:** English



### Summary:

You invented photography several years before Daguerre. True, you didn't tell anyone about your experiments before Daguerre's announcement, but when his daguerreotypes became known in January last year you immediately held a lecture at the Royal Institution and exhibited some of the paper photographs you took in 1835. You have brought a selection of them with you tonight – they are far superior to daguerreotypes, which are made on silver-plated copper. You instead expose a *negative* and then print a *positive* from this on paper, which is far more convenient. Your first photogenic drawings were made using paper bathed in saltwater and brushed with silver nitrate that darkens when exposed to light. You are currently working on a new process, the *calotype*, or *talbotype* (a flattering name!) which reduces the exposure time needed to only a couple of minutes in bright sunlight. You are married to Constance, and have three children aged 5, 3 and 1 year old. After this party you will write her a loving letter about how people admired your pictures. Her loving and womanly support of your work lends you great strength.

### Three things you can do:

- The French state granted Daguerre a pension for his invention, and declared that his invention was "free to the world". The British government is terrible at funding inventions – look at Babbage who can't get more funding for his new improved calculating engine! So you think you'll need to patent your calotype process because you need the money. Try to find out whether people will support you in this.
- Does patenting of technology relate to copyright of literary works? You hear **Mr Talford** has proposed a new Copyright Act to parliament, and that several authors find that their work is copied in America with no royalties to them. Would they support a patent on the calotype? What about the images produced by the process? Perhaps you should...
- You should also consider the work of Sir David Land...er...in...

## Lady Ada Lovelace

**GROUP:** Aristocrat  
**AGE IN 1840:** 25  
**CLASS:** Aristocrat  
**NATIONALITY:** English



### Summary:

You are infatuated with Babbage's calculating machines. You first attended one of Babbage's soirées when you were 17, and you immediately understood how the Difference Engine worked. You and **Mr Babbage** have been close friends and correspondents ever since, and you and he are devising how the new Analytical Engine can be instructed to solve complicated mathematical problems. Your mother, **Lady Annabella Byron**, made sure you learnt mathematics, though mostly to keep you away from the dangerous poetic imagination of your scandalous father Lord Byron. You are married to Lord Lovelace (William) and have a large London home at St James's Square and a couple of country homes. You have three children and hope you won't have more. The nannies and governesses take care of them. You spend several hours a day practicing the harp and learn German in addition to your mathematical work.

### Three things you can do:

- Find out as much as you can about new inventions and discuss whether they could be augmented with a set of instructions given through punch cards or a more advanced mathematical framework.
- Your personal allowance is only £300 a year and it is not always enough to pay for clothes, books, harp lessons and governesses and tutors for the children. Ask **Mary Somerville** if she has ever tried using mathematics to help win money on horses. Your mother would be furious. But it is an interesting challenge. You might also want to have a chat with **Caroline Norton**. She and **Thomas Talford** just changed the law so mothers have custody of their children. Now they're campaigning for married women's right to own property. Your husband William controls the substantial wealth you brought into the marriage.
- You heard **Felix Mendelssohn** the composer might be here, and you know he has spent time in Wales, so he must love the harp, which is so emblematic of the country. Ask if he is planning on writing any harp music you could play, perhaps in the Welsh style?

### Relationships:

- You and **Charles Babbage** are working on instructions for the Analytical Engine.
- **Mary Somerville** is a great friend of your mothers, and has mentored you.
- Your father **Lord Byron** is dead and your parents separated when you were a baby. He was a celebrity, a Romantic genius poet, and Byronomania is still alive. You feel you have some of his poetry and imagination, and want "poetic science".

## Mr Charles Darwin

**GROUP:** Natural scientist men  
**AGE IN 1840:** 31  
**CLASS:** Upper class (landed gentry)  
**NATIONALITY:** English

### Summary:

You are a geologist and biologist. You are very much in love with Emma, who you married last year. You are a doting and physically affectionate father to your darling baby boy William, whom you call "Hoddy Doddy", and you rent a ridiculously brightly painted house you call Macaw Cottage just a twenty minute walk from here. You love your research and know with absolute certainty that you have discovered a new theory of natural selection and evolution that will revolutionise our understanding

### Three things you can do:

- You're a geologist and biologist. You're very much in love with Emma, who you married last year. You're a doting and physically affectionate father to your darling baby boy William, whom you call "Hoddy Doddy", and you rent a ridiculously brightly painted house you call Macaw Cottage just a twenty minute walk from here. You love your research and know with absolute certainty that you have discovered a new theory of natural selection and evolution that will revolutionise our understanding
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## Mrs Fanny Trollope

**GROUP:** Author  
**AGE IN 1840:** 61  
**CLASS:** Middle upper class. You and your husband need to earn a living from your work.  
**NATIONALITY:** English



### Summary:

You are a novelist and a widow who supports herself by writing. Luckily your books sell very well. You are flamboyant: this evening you are wearing a grass green velvet gown and a flaring turban. You have just published what will become known as the first industrial novel, *Michael Armstrong: Factory Boy*. A few years ago you wrote a novel against slavery, and you have also written about corruption. You lived in America for several years, spending some time in Fanny Wright's utopian community the Nashoba Commune, which was intended to educate slaves and help them

### Three things you can do:

- Converse politely with the **Americans** who are present this evening while making it entirely clear that you look down upon them and find their manners – and their democracy – distasteful. And that foul habit of spitting chewing tobacco on the carpet! You certainly hope nobody does that this evening!
- If you feel daring, you might remark to **Dwarkanath Tagore**, the rich Indian industrialist, that you like his turban. Yours is more striking though.
- Ask another guest if they have seen Mr Babbage's Difference Engine, and ask whether they think it will lead to a new type of industrialisation. Will there be child labourers in factories filled with calculating machines?

### Quote:

*...single word indicative of doubt, that any thing, or any thing, in that country, is not the very best in the world, produces an effect which must be seen and felt to be understood. If the citizens of the United States were indeed the devoted patriots they call themselves, they would surely not thus encrust themselves in the mud of dry, stubborn persuasion, that they are the first best of the human race, that nothing is to be learnt from what they are able to teach, and that nothing is to be had, which they do not possess."*

### Three things you can do:

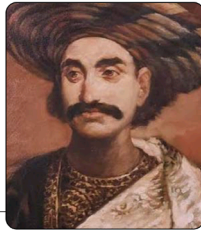
You really aren't feeling well. Ask **Dr Neil Arnott** if he has any advice for stomach troubles that won't seem to go away.  
 Discuss human anatomy with the artists. **Charles Landseer** is known for his anatomical sketches of human muscles. Perhaps better illustrations would help promote your ideas?  
 Discuss implications of the idea of evolution and natural selection with social scientists like **Harriet Martineau** or **Monsieur de Sismondi**. If even humans can evolve, does this mean that the poor are not necessarily destined to remain poor forever?

### Relationships:

You are very much in love with your wife **Emma**, who is also your first cousin. **Adam Sedgwick** was your friend and mentor. You are also your first cousin. **Adam Sedgwick** was your friend and mentor. You are also your first cousin. **Adam Sedgwick** was your friend and mentor. You are also your first cousin.

## Dwarkanath Tagore

**GROUP:** Europeans and Indians  
**AGE IN 1840:** 45  
**CLASS:** A 'Prince' - not really, though, you simply earned that epithet for being so incredibly wealthy.  
**NATIONALITY:** Indian



### Summary:

Born into the wealthy Tagore family of Kolkata, you received a huge inheritance aged only 13. You are a western-educated Bengali Hindu, who apprenticed under a renowned Scottish barrister. You are a civic leader of Calcutta and have an extravagant lifestyle. You can easily afford this lifestyle, as you are an extremely successful entrepreneur and industrialist - one of the first to form an enterprise with British partners! You (co-)founded multiple companies (in banking, shipping, insurance...) - including Carr, Tagore and Company, which deals with opium trade. You also invest heavily in tea plantations, arts, coal mines, etc., and truly believe that industrialization is the future! You are quite a ladies man, entertaining many close 'friendships' with women, and you do not hide it either!

### Three things you can do:

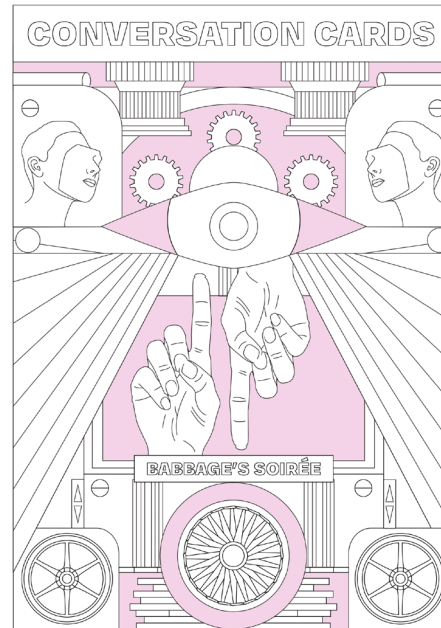
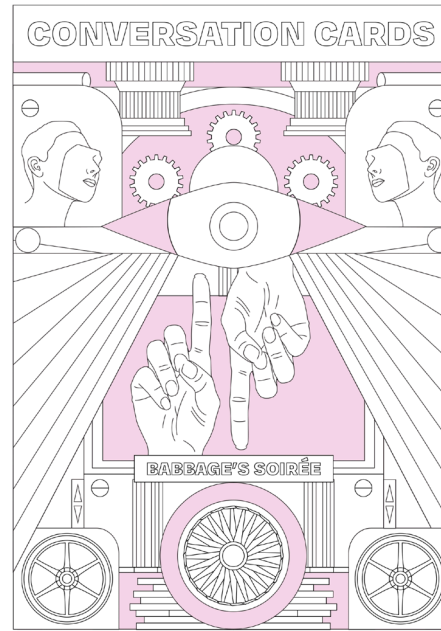
- Find **John Taylor** to discuss future business ventures. As an investor in coal mines, you would be keen to talk to this mining engineer, he is, after all, a leading figure in the international mining industry!
- Go to **Hugh Falconer** to talk about tea. Falconer has been commissioned to look into the commercial feasibility of tea back in 1834, and his positive recommendation offered you investment opportunities. You have invested in profitable tea plantations, and are keen to thank him for his good counsel.
- Find **Caroline Norton** to discuss a plan of yours. You want to host a lavish party in 'Calcutta style' on a huge boat on the river Thames, and invite all manners of culturally significant people. You need some help in making arrangements, though, and Mrs Norton knows many interesting people.

### Relationships:

- You share a close friendship with **Caroline Norton**, though recently you have noticed that some seem to think there might be more going on there... You share many interests with **Charles Babbage** and **John Taylor**, especially concerning industrialism and technology. **Hugh Falconer** has also spent a large part of his life in Bengal, India.

### Key issues:

- You are an advocate for social reform and Western thinking. You oppose outdated traditions like the Sati (the sacrificing of widows), see value in education for all classes, and are in favour of societal and technological advances. You engage in philanthropy, and care a lot about India's industrial development, always seeking new business ties. You are also a true patron of the arts, and play an important role in the Bengali renaissance!



## Conversation cards

Babbage's soirée

Science  
Literature

*"Do you think literary and artistic advancements influence ideas and inventions in science?"*

### Background

The soirées included scientists and engineers as well as artists, novelists and actors.

## Conversation cards

Babbage's soirée

Early photography  
Telegraphy

*"Imagine if Mr Wheatstone's and Mr Cooke's telegraph could be used to send pictures as well as codes!"*

### Background

Cooke and Wheatstone telegraph 1837 - first commercial telegraph system, used for Great Western Railway in 1838 (London-West Drayton).  
 Fox Talbot's calotypes were an early photographic process introduced in 1841. He showed early versions at Babbage's soirées.



NAME

Material: PLA  
Prompt: ...

Prompt:   
"MAKERPIECE X  
CUT GPT NAME"  
Material: PLA

Prompt:   
"IMAGE OF A  
SHEW-NEED DANCER"  
Material: PLA

Prompt:   
"MAKERPIECE X  
CUT GPT NAME"  
Material: PLA

Material: PLA

Prompt:   
"CURE GPT  
VIRTUAL TILE"  
Material: PLA

Prompt:   
"DECORATIVE WALL  
COCOA WINKS TILE"  
WALL LOOK STYLISH"  
(From Instagram)

Webtool / model:   
MAKERPIECE X  
CUT GPT NAME  
FROSTSTONE  
Material: PLA

Workshop on generative AI and physical manufacturing. Photo: Gabriele de Seta

## ART PRACTICE

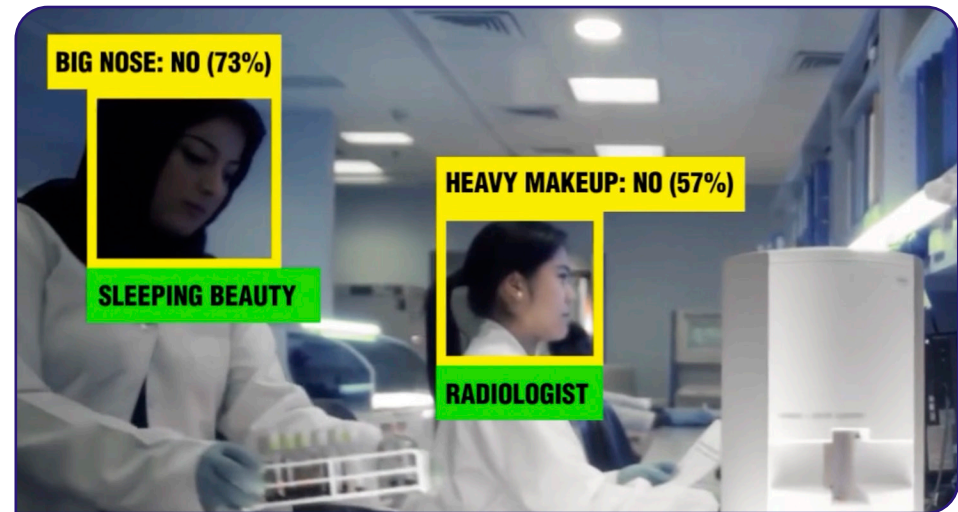
Beyond collaborative efforts like the exhibition and the larp, individual project members also produced creative outputs to disseminate research findings in formats other than academic writing. Linda Kronman in collaboration with Andreas Zingerle produced *Suspicious Behavior* (2020), a speculative annotation tutorial which immerses readers in a critical exploration of labeling images for AI powered machine vision (see page 23). Commissioned by esc medien kunst labor (Graz, Austria) for the Cyborg Subjects exhibition and displayed in international group exhibitions on three continents, the artwork sparks dialogues on ethical AI practices and advocates for the need to rethink annotation workflows. Another artwork by Kairus, *Future past still in the making* (2019), addresses machine vision imaginaries in smart city context and was finished during a micro residency at Bergen Centre for Electronic Arts.

Gabriele de Seta has written the *APAIC Report on the Holocode Crisis*, a short sci-fi story published on the *Surveillance & Society* journal which speculates about the near future of machine-readable data encodings, imagining what the invention of holographic QR codes could mean for societies when every object becomes scannable. Gabriele has also compiled some of the visual materials he collected throughout his fieldwork into a hour-long livestreamed 'screen walk' organized by The Photographers' Gallery and the Fotomuseum Winterthur.

In collaboration with artist Magnhild Øen Nordahl and the Bergen Centre for Electronic Arts, Gabriele de Seta also organized a workshop on generative AI and physical manufacturing. As the project concludes in July 2024 he is working on *Latent China*, an experimental documentary composed of AI-generated videos resulting from China-related prompts.

READ MORE

de Seta, Gabriele de. 2021. 'APAIC Report on the Holocode Crisis'. *Surveillance & Society* 19 (4): 474–79. <https://doi.org/10.24908/ss.v19i4.15154>.



WATCH SCREEN WALK ON



## ANNOTATED BIBLIOGRAPHY

### MONOGRAPH

Rettberg, Jill Walker. 2023. *Machine Vision: How Algorithms Are Changing the Way We See the World*. Cambridge: Polity Press.

This book provides an accessibly written overview of the history and contemporary uses of machine vision technologies and uses contemporary critical theory to unpack how technologies like smart surveillance cameras and TikTok filters shape our interactions with technology and each other. By analysing specific fictional and real-world situations involving machine vision technologies, this book shows how technologies can have very different impacts in different cultural settings. The combination of aesthetic analysis with ethnographic and critical media studies approaches makes *Machine Vision* an engaging and eye-opening read for students and scholars of digital media studies, science and technology studies, visual studies, digital art and science fiction, as well as for readers who want to create or evaluate new machine vision technologies.

### SPECIAL ISSUE OF JOURNAL

Rettberg, Jill Walker, Gabriele de Seta, Marianne Gunderson, and Linda Kronman, eds. 2024. 'Cultural Representations of Machine Vision'. *Open Journal of the Humanities* 9 (2). <https://olh.openlibhums.org/collections/877/>.

Authors contributing to this special collection survey how machine vision technologies are represented and narrated across different sociocultural domains. Cultural production – including literature, art, cinema, video games, science fiction, memes, fandom and more – is a rich source for understanding the impact of machine vision technologies on society, as well as their potential future trajectory.

### DATASET

Rettberg, Jill Walker, Linda Kronman, Ragnhild Solberg, Marianne Gunderson, Stein Magne Bjørklund, Linn Heidi Stokkedal, Gabriele de Seta, Kurdin Jacob, and Annette Markham. 2022. 'A Dataset Documenting Representations of Machine Vision Technologies in Artworks, Games and Narratives'. *DataverseNO*. <https://doi.org/10.18710/2G0XKN>.

The dataset includes records of 500 creative works (including 77 digital games, 190 digital artworks and 233 movies, novels and other narratives) that use or represent machine vision technologies like facial recognition, deepfakes, and augmented reality. In the various works we identified 874 specific situations where machine vision is central. The dataset includes detailed data about each of these situations that describes the actions of human and non-human agents, including machine vision technologies. The dataset is particularly useful for humanities and social science scholars interested in the relationship between technology and culture, and for designers, artists, and scientists developing machine vision technologies.

Rettberg, Jill Walker, Linda Kronman, Ragnhild Solberg, Marianne Gunderson, Stein Magne Bjørklund, Linn Heidi Stokkedal, Gabriele de Seta, Kurdin Jacob, and Annette Markham. 2022. 'Representations of Machine Vision Technologies in Artworks, Games and Narratives: Documentation of a Dataset'. *Data in Brief* 42. <https://doi.org/10.1016/j.dib.2022.108319>.

This data paper documents the core dataset the project developed. The dataset captures the portrayal of machine vision technologies in 500 creative works: digital artworks, video games and narratives including movies, novels and more. This is a purely descriptive paper in the genre "data paper", so it describes the data, the methodology used and how the dataset can be used with the goal of making the data more accessible to other researchers. Our analyses can be found in other publications.

## PEER-REVIEWED JOURNAL ARTICLES AND BOOK CHAPTERS

2024

Atalaia, Nuno, and Marianne Gunderson. 'Alexa's Monstrous Agency: The Horror of the Digital Voice Assistant.' In review, June 2024.

This paper explores how digital voice assistants such as Amazon's Alexa are imagined as monstrous in digital horror stories shared on the subreddit NoSleep, and discusses how these same monstrous figurations appear in Amazon's official advertisement campaigns for the device. We ask how anxieties surrounding the blurred boundaries of human and non-human agencies introduced by the Alexa interface are represented and negotiated across different narrative forms and archives.

de Seta, Gabriele. Forthcoming. 'Technologies of Clairvoyance: Chinese Lineages and Mythologies of Machine Vision'. In *Machine Decision Is Not Final: China and the History and Future of AI*, edited by Benjamin Bratton, Anna Greenspan, and Bogna Konior. SI. Cambridge, Massachusetts: MIT Press.

This book chapter traces the historical lineages of clairvoyance in Chinese mythology, literature and art, relating it to the national development of research into optics and cybernetics, and demonstrating how these connect to contemporary machine vision products like surveillance camera systems and autonomous robots.

Gunderson, Marianne. 'The Tiktok Algorithm Knows Exactly What I Like. I Feel Seen': Imaginaries of Algorithmic Self-Perception. In review, June 2024

This paper asks what it means to feel seen by the TikTok algorithm. Through a thematic analysis of Tweets containing the terms 'TikTok' and 'algorithm' I explore the algorithmic imaginaries of recognition and self-making in interactions with the algorithmic feed, developing three main themes: the algorithm as an intimate other, the algorithm as an apparatus of observation, and algorithmic intensity.

Gunderson, Marianne, Ragnhild Solberg, Linda Kronman, Gabriele de Seta, and Jill Walker Rettberg. 2024. 'Machine Vision Situations: Tracing Distributed Agency'. *Open Research Europe* 3 (August):132. <https://doi.org/10.12688/openreseurope.16112.1>.

This paper introduces the concept of the 'machine vision situation', defined as the moment in which machine vision technologies come into play and make a difference to the course of events, and proposes a method for analysing distributed agency between machine vision technologies, humans, and other entities within these situations. This method, when repeated, can be a basis for a quantitative analysis, but it can also be the foundation for close reading, by asking what is left over or unarticulated from the initial analysis.

Rettberg, Jill Walker. 2024. 'Controlling Drones in Contemporary Science Fiction'. In *Drones in Society: New Visual Aesthetics*, edited by Elisa Serafinelli. Basingstoke: Palgrave. [https://doi.org/10.1007/978-3-031-56984-5\\_2](https://doi.org/10.1007/978-3-031-56984-5_2)

In our dataset of 500 creative works, machine vision is generally portrayed as being more helpful than hostile. However, drones stand out, alongside facial recognition and surveillance cameras, as being predominantly hostile technologies, in contrast to the mostly helpful holograms, augmented reality, general AI and devices that display the non-visible spectrum. Drawing upon data analysis of 79 machine vision situations involving drones, this paper identifies the repeated emphasis on controlling drones as a strategy for negotiating with machine vision technologies that are generally framed as oppressive.

2023

de Seta, Gabriele, and Anya Shchetvina. 2023. 'Imagining Machine Vision: Four Visual Registers from the Chinese AI Industry'. *AI & SOCIETY*, August. <https://doi.org/10.1007/s00146-023-01733-x>.

This article draws on the concept of sociotechnical imaginaries to understand how Chinese companies represent machine vision. Through a qualitative, multimodal analysis of the corporate websites of leading industry players, we identify a cohesive sociotechnical imaginary of machine vision, and explain how four distinct visual registers contribute to its articulation.

de Seta, Gabriele. 2023. 'QR Code: The Global Making of an Infrastructural Gateway'. *Global Media and China*, 1–19. <https://doi.org/10.1177/20594364231183618>

Through the analysis of patents, corporate documents and advertising, ethnographic observations, and interviews with professionals, this article traces the global making of machine-readable data encoding standards and argues that the QR code has become an infrastructural gateway.

Kronman, Linda. 2023. 'Hacking Surveillance Cameras, Tricking AI and Disputing Biases: Artistic Critiques of Machine Vision'. *Open Library of Humanities Journal* 9 (2). <https://doi.org/10.16995/olh.10181>.

Artistic tactics of hacking machine vision in the early 2000's was about hijacking the broadcasting signals of surveillance cameras. This article addresses what is coined as the intuition machine shift, a transformation from artists hacking CCTV cameras as hardware to ways of tricking AI software. With this shift new types of art-hack tactics emerge, some of them specifically challenging the objectivity of machine vision by exposing harmful biases. From these art-hacks we can learn approaches to dispute machine vision biases, to provoke discourse and to renegotiate values and worldviews embedded in machine vision.

Kronman, Linda. 2023. 'Classifying Humans: The Indirect Reverse Operativity of Machine Vision'. *Photographies* 16 (2): 263–89. <https://doi.org/10.1080/17540763.2023.2189160>.

Machine vision is experienced differently depending on context and who is interacting with it. Artistic audits, artworks that test AI augmented machine vision products have been influential in communicating the harms these technologies cause. However, inequalities in AI do not solely emerge when these technologies are used. There are inequalities and power imbalances involved in how machine vision is developed and designed. This article looks more closely at the action of labelling images as operations which shape how machine vision operates back on us by classifying humans. Drawing on artistic research to design a speculative image annotation interface, the article demonstrates that both human and machine classifiers are entangled in amplifying stereotypes and inequalities cycles of image labelling coined as indirect reverse operativity.

2022

Rettberg, Jill Walker. 2022. 'Algorithmic Failure as a Humanities Methodology: Machine Learning's Mispredictions Identify Rich Cases for Qualitative Analysis'. *Big Data & Society* 9 (2): 20539517221131290. <https://doi.org/10.1177/20539517221131290>.

This paper tests a new method for using machine learning in qualitative research. I train a simple machine learning algorithm on our dataset of 500 creative works and ask it to predict whether actions are passive or active based on the age, gender, race and species of the characters involved in each action. The cases where the algorithm failed to make a correct prediction were the cases that are most interesting for qualitative analysis.

Solberg, Ragnhild. 2022. '(Always) Playing the Camera: Cyborg Vision and Embodied Surveillance in Digital Games'. *Surveillance & Society* 20 (2). <https://doi.org/10.24908/ss.v20i2.14517>.

This paper explores how games imagine and influence surveillance. Digital games often present the player's screen as in-game surveillance cameras, which has direct consequences for how players understand and interact with the virtual world. The article presents the term 'cyborg vision' to account for this human and non-human experience.

Solberg, Ragnhild. 2022. "'Too Easy' or 'Too Much'? (Re)Imagining Protagonistic Enhancement through Machine Vision in Video Games'. *Przegląd Kulturoznawczy*, no. 4 (54) (December), 548–69. <https://doi.org/10.4467/20843860PK.22.037.17091>.

This paper explores how digital games that valorize techno-masculine imaginaries of superhuman domination also present humans as depending on computational and non-human agencies to succeed. Through close readings of select games, the paper argues that sharing vision and agency with machines both enables and complicates fantasies of dominance in games.



2021

de Seta, Gabriele. 2021. 'Huanlian, or Changing Faces: Deepfakes on Chinese Digital Media Platforms'. *Convergence: The International Journal of Research into New Media Technologies* 27 (4): 935–53. <https://doi.org/10.1177/13548565211030185>.

I summarize the global emergence of deepfakes and the local history of huanlian ('changing faces') in China, discussing their development across consumer apps, commercial services, and communities of practice. Drawing on three case studies, I argue for the importance of situating specific applications of deep learning in their local contexts.

de Seta, Gabriele. 2021. 'APAIC Report on the Holocode Crisis'. *Surveillance & Society* 19 (4): 474–79. <https://doi.org/10.24908/ss.v19i4.15154>.

Through this short sci-fi story combining fictional fieldnotes, interview transcripts, OCR scans and intelligence reports, I imagine the near future development of data encoding patterns: after barcodes and QR codes, the invention of 'holocodes' will make it possible to store unprecedented amounts of data in a minuscule physical surface.

Gunderson, Marianne. 2021. 'Populærkulturelle Forestillinger Av Utvidet Virkelighet: Makt Og (u)Leselige Identiteter Når Verden Blir En Skjerm'. *Tidsskrift for Kjønnforskning* 45 (02–03): 89–104. <https://doi.org/10.18261/issn.1891-1781-2021-02-03-03>.

[English translation: Visions of augmented reality in popular culture: Power and (un)readable identities when the world becomes a screen. <https://doi.org/10.48550/arXiv.2306.04434>]

This paper analyses the representation of augmented reality in three works of dystopian science fiction in visual media. Reading visions of augmented reality through feminist theory, I argue that augmented reality technologies enter into assemblages of people, discourses, and technologies, by forming a grid of intelligibility that codifies identities, structures hierarchical relationships, and scripts social interactions.

Solberg, Ragnhild. 2021. 'Hologrammer i Grenseland: Ikke-menneskelige Aktørers Tilstedeværelse Og Handlingsrom i Spill [Holograms in the Borderlands: Non-Human Presence and Agency in Games]'. *Norsk Medietidsskrift* 28 (4): 1–20. <https://doi.org/10.18261/issn.0805-9535-2021-04-03>.

This paper tracks a broad cultural understanding of hologram technology and identifies holographic representations in digital games. I argue that holograms in games have aesthetic, narrative, and mechanical functions that challenge binary conceptualizations of presence and agency, which helps us see how machines and humans are connected in complex posthuman assemblages.

2020

Gunderson, Marianne, Wester Coenraads, Marc Tuters, Gaurish Thakkar, Diego Alves, and Hana Marčetić. "Machine Vision Creepypasta: Surveillance Devices in Digital Horror." Report for Digital Methods Summer School 2020, 2020. <https://docs.google.com/document/d/1qnALNhhjryyFmIU6pPWRRmoZxP-2G7yyozfUIRKiYjrR8/edit#>.

This report explores the representation of machine vision technologies in vernacular horror stories posted to the NoSleep community on reddit. Using a combination of computational methods and qualitative analysis, we analyse the way different technologies are imagined to become sources of, or vehicles for, horror.

Kronman, Linda. "Intuition Machines: Cognizers in Complex Human-Technical Assemblages." *A Peer-Reviewed Journal About* 9, no. 1 (August 4, 2020): 54–68. <https://doi.org/10.7146/aprja.v9i1.121489>.

What can we learn about machine vision bias from art? This article addresses artworks which expose that assembling machine learning datasets is fundamentally about creating worldviews. Thus, rather than assuming machine vision predictions to be objective or true, the article suggests approaching these technologies as intuition machines, technologies that produce technical intuitions reflecting biases and values of those who create them.

Kronman, Linda, and Andreas Zingerle. 2020. 'Munster Erkennen Und Die Zukunft Vorhersagen/ Recognizing Patterns and Predicting Futures'. In *ML IM NETZ DER SINNE*, edited by J Hofmüller, R Hofmüller, D Jakely, and M Maierhofer-Lischka. Graz: mur.at.

This book chapter discusses different approaches to machine vision and machine learning in digital art (in English and German).

## 2019

Rettberg, Jill Walker. 2019. 'Et algoritmisk blikk: Algoritmers rolle i produksjonen av hverdagsfotografier.' *Norsk medietidsskrift* 26, no. 01 (March 22, 2019): 1–20. <https://doi.org/10.18261/ISSN.0805-9535-2019-01-03>.

Algorithms generate and interpret images not just by sorting and ranking images on social media platforms, but also by determining which photographs to take in the first place through the aesthetic inference algorithms built into our cameras. This paper examines how these algorithms work, and what kinds of aesthetic criteria are programmed into them. As the algorithms themselves are blackboxed, the material analysed includes three groups of photographs: the Instagram account @Insta\_repeat, NRK's hashtag campaign #nrksommer, and the twenty most popular images on Instagram. The paper also discusses a selection of articles on the development of aesthetic inference algorithms written by computer scientists, analyses marketing materials for cameras, and presents a historical comparison of the aesthetics of camera clubs and in pictorialism with the data sets used in the development of aesthetic inference algorithms today. The main argument of the paper is that aesthetic inference algorithms and ranking algorithms lead to less diversity in our photographs, and that the algorithms are driven by a commercial rationale aimed at increasing the consumption of images and cameras.

## PUBLISHED CONFERENCE PAPERS

Kronman, Linda, and Andreas Zingerle. 2022. 'Suspicious Behavior: A Fictional Annotation Tutorial'. In Nordic Human-Computer Interaction Conference, 1–3. NordiCHI '22. New York, NY, USA: Association for Computing Machinery. <https://doi.org/10.1145/3546155.3547288>.

This paper addresses the role of instructive interface design in data annotation of image datasets drawing on artistic research for the artwork *Suspicious Behavior*.

Kronman, Linda, and Andreas Zingerle. 2022. 'Suspicious Behavior'. In *xCoAx 2022: Proceedings of the 10th Conference on Computation, Communication, Aesthetics & X*, edited by Miguel Carvalhais, Mario Verdicchio, Luísa Ribas, and André Rangel, 318–26. Coimbra, Portugal: i2ADS. [https://doi.org/10.24840/xCoAx\\_2022\\_53](https://doi.org/10.24840/xCoAx_2022_53).

A short art paper contextualising *Suspicious Behavior* in the fields of digital art and critical data set studies.

Kronman, Linda. 2019. 'The Deception of an Infinite View: Exploring Machine Vision in Digital Art'. In *Proceedings of POM Beirut 2019*, 70–77. Beirut. <https://doi.org/10.14236/ewic/POM19.11>.

Drawing on histories of aerial photography and examples of contemporary digital art the paper discusses Queryable Earth's visions to deploying pattern recognition on satellite images. It illustrates how Queryable Earth is limited to a singular aerial perspective and constrained by quality and selection of training data.

Kronman, Linda. 2019. 'Machine Vision in Digital Art'. In *xCoAx 2019: Proceedings of the Seventh Conference on Computation, Communication, Aesthetics and X*, 366–70. Milan, Italy. <http://2019.xcoax.org/xCoAx2019.pdf>.

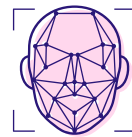
Presentation of PhD research in the Doctoral symposium of the xCoAx conference chaired by Simona Chiodo and Philip Galanter.

Kronman, Linda, and Andreas Zingerle. 2019. 'Panoptcities: Artwork Submission'. In *Proceedings of the 9th International Conference on Digital and Interactive Arts*, 1–4. ARTECH 2019. New York, NY, USA: Association for Computing Machinery. <https://doi.org/10.1145/3359852.3359957>.

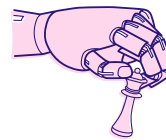
A short art paper contextualizing the artwork *Panoptcities* in an artistic practice of hacking surveillance cameras.

Rettberg, Jill Walker, Marianne Gunderson, Ragnhild Solberg, Linda Kronman, and Linn Heidi Stokkedal. 2019. 'Mapping Cultural Representations of Machine Vision: Developing Methods to Analyse Games, Art and Narratives'. In . Hof, Germany: ACM New York, NY, USA. <https://doi.org/10.33767/osf.io/fvwm8>.

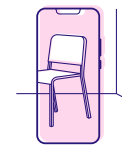
A work in progress paper on the Database of Machine Vision in Art, Games and Narratives.



Identifying  
Classifying  
Detecting



Analysing  
Scanning  
Communicating



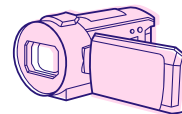
Displaying  
Informing  
Revealing



Identifying  
Scanning  
Analysing



Scanning  
Analysing  
Revealing



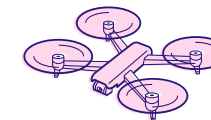
Capturing  
Recording  
Revealing



Capturing  
Recording  
Hacked



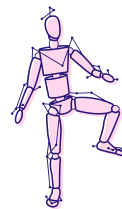
Scanning  
Revealing  
Reconstructing



Recording  
Killing  
Scanning



Analysing  
Classifying  
Detecting



Tracking  
Detecting  
Scanning



Classifying  
Detecting  
Analysing



Displaying  
Projecting  
Communicating



Filtering  
Overlaying  
Hiding



Zooming  
Revealing  
Targeting

60%, 42%, 80%, 16%

Critical: ■■■  
Inspired: ■■■  
Focused: ■■■  
Surprised: ■

Rettberg, Jill Walker, Linda Kronman, Gabriele de Seta, Marianne Gunderson and Ragnhild Solberg. 2024. "What Machine Vision Does: Final Report on Machine Vision in Everyday Life (2024)". <https://doi.org/10.5281/zenodo.12706336>

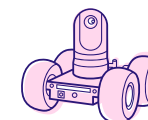
Layout: Linda Kronman  
Graphic Design: Maren Knudsen



Recording  
Capturing  
Transmitting



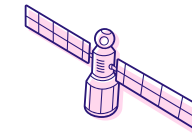
Simulating  
Generating  
Showing



Controlled  
Streaming  
Revealing



Recording  
Streaming  
Surveilling



Revealing  
Locating  
Mapping