Thijmen **Nijdam**

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Homepage | GitHub | LinkedIn | Google Scholar

Education

M.Sc. in Artificial Intelligence **2023 - Present**

University of Amsterdam *Amsterdam*

- Grade: 8.2
- Relevant courses: Machine Learning I & II, Deep Learning I & II, Computer Vision, Reinforcement Learning, Information Retrieval I & II, Foundation Models
- Thesis: Affordance-centric world models for zero-shot model predictive control in articulated object manipulation

B.Sc. in Artificial Intelligence **2020 - 2023**

University of Amsterdam *Amsterdam*

- Grade: 8.1, graduated with honours
- Exchange at The University of Hong Kong (HKU), following computer science courses
- Thesis: Leak Failure Detection in Refrigeration and Cold Storage Systems

VWO Gymnasium **2013 - 2020**

Murmellius Gymnasium *Alkmaar*

Experience

AI Software Developer **Apr. 2022 - Present**

LeerLevels *Amsterdam*

- Designed and integrated LLM-powered components within the existing full-stack system for automated grading and content generation, including prompt design and traffic monitoring using Langfuse for observability
- Optimized the learning-objective dependency graph by leveraging LLMs to refine structure and relationships between educational concepts

Research Internship **Nov. 2024 - Mar. 2025**

VIS Lab, University of Amsterdam *Amsterdam*

- Worked on a benchmark testing physical reasoning in video generation models
- Built a segmentation and tracking pipeline for the physical objects and tested and set up video generation models for the benchmark
- Under review at ICML, preprint available on arXiv

Research Internship **Sep. 2024 - Dec. 2024**

The Netherlands Cancer Institute *Amsterdam*

- Explored the use of 3D diffusion models for CT scan data to improve radiotherapy treatment planning, supervised by Stefanos Achlatis

Machine Learning Engineer **Feb. 2023 - Jan. 2024**

Dutch Nao Team, University of Amsterdam *Amsterdam*

- Built Single Shot Detector (SSD) pipelines for ball and robot detection in robot soccer
- Implemented a whistle detection model to trigger match events in real time
- Competed in robotics competitions with the team, including German Open Replacement Cup and RoboCup in Bordeaux

Publications

Morpheus: Benchmarking Physical Reasoning of Video Generative Models with Real Physical Experiments **Under review**

International Conference on Machine Learning (under review) *2025*

- Developed a benchmark for evaluating physical reasoning in video generation models, building segmentation and tracking pipelines for physical objects
- Preprint

Reproducing NevIR: Negation in neural information retrieval **SIGIR**

48th International ACM SIGIR Conference on Research and Development in Information Retrieval *2025*

- Reproduced and extended the NevIR benchmark to evaluate negation understanding in IR models, introducing state-of-the-art architectures such as listwise LLM re-rankers, and further assessed model generalizability on the ExcluIR benchmark for exclusionary queries
- Paper | Code | Poster

HIVE: A Hyperbolic Interactive Visualization Explorer for Representation Learning **ICCV Workshop**

2nd Beyond Euclidean Workshop: Hyperbolic and Hyperspherical Learning for Computer Vision *2025*

- Developed HIVE, an interactive dashboard for exploring and interpreting hierarchical embeddings, featuring 2D projections, configurable dimensionality reduction, and interactive analysis modes to support intuitive understanding of hyperbolic representations
- Paper | Code | Demo

Conformal time series decomposition with component-wise exchangeability **COPA**

13th Symposium on Conformal and Probabilistic Prediction with Applications *2024*

- Developed a decomposition-based approach for uncertainty quantification in time series forecasting, extending conformal prediction methods to handle temporally correlated data
- Paper | Code | Slides

Reproducibility Study Of Learning Fair Graph Representations Via Automated Data Augmentations **TMLR**

Transactions on Machine Learning Research *2024*

- Conducted a reproducibility study of the Graphair framework for fair graph representation learning, verifying original claims on node classification and extending the evaluation to link prediction tasks to assess fairness–accuracy trade-offs across multiple datasets
- Presented at NeurIPS 2024 as part of the Machine Learning Reproducibility Challenge
- Paper | Code | Poster | Slides

Extracurricular Activity

AI Safety Reading Group Facilitator **Mar. 2024 - Jun. 2024**

Facilitated reading groups based on BlueDot Impact's AI Alignment course

Hackathons

- European Robotics Forum Hackathon (2022)
- AI Safety Hackathon (2024)

Robotics Competitions

- German Open Replacement Cup (2023)
- RoboCup (2023)