Coen van den Elsen

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Academic Qualifications

University of Amsterdam — *Amsterdam, Netherlands*

Msc Major Artificial Intelligence — *Sept 2023 - present*

- GPA 8.1 (as per 15 heb 2025)

University of Amsterdam — *Amsterdam, Netherlands*

BSc Natural and Social Sciences - Specialization Artificial Intelligence — *Sept 2019 - july 2023*

- Honors program
- GPA 8.02/10

University of Cape Town — *Cape Town, South Africa*

Exchange program — *July 2022 - December 2022*

- **Courses:** Marine Recourses and Geography, Development and Sustainabilty

Work Experience

OceanOS — *London, UK*

Machine Learning Intern — *January 2025 - Present*

- Developing AI models leveraging geospatial data to enhance oceanic intelligence and support marine conservation
  - Created geospatial pretraining dataset
    - Preprocessed NetCDF files of different variables, resolutions, and locations in the cloud.
    - Learned to optimize memory usage: work with data in the cloud and stream data instead of downloading locally.
    - Learned to work with optimized object storage for streaming and I/O operations in the cloud: storage in Zarr format.
  - Designed novel foundation model DARWIN
    - Understands 3D spatiotemporal (marine) data.
    - Handles land vs ocean semantics.
    - Fully parallelized.
  - Implemented pre-training pipeline
    - PyTorch Lightning (with CLI).
    - Fully integrated automatic multi-GPU training.
    - Implemented unit tests with GitHub automated workflows.
    - Numerous failsafes such as intermediary uploads to the cloud during training and after model runs.
    - Monitoring integration with Weights Biases.
    - Environmental impact monitoring with CodeCarbon.
  - Docker
    - Learned to fully dockerize (multi-GPU) training pipeline for machine-agnostic deployment in the cloud.
    - Reduced image building time by 25% with multistage builds and using UV.
  - Using cloud compute providers AWS and Digital Ocean
    - Learned to set up cloud architecture from scratch.
    - S3 storage.
    - Instances for single- and multi-GPU training.
    - Learned when to use which GPU.
  - Optimized training pipeline, resulting in 70× faster training without loss in performance
    - Optimized data storage (massively reducing the number and size of chunks needed to be loaded into memory).
    - Optimized data streaming into training loop.
    - Profiled and optimized data loader.
    - Profiled and optimized model.
    - Used mixed-precision training.
  - Developing models for:
    - Forecasting.
    - Species distribution modeling.
    - Sediment prediction.

University of Amsterdam *Amsterdam, Netherlands*

Teaching Assistant at FNWI *September 2020 - January 2025*

- Teaching the following courses:
  - Programming in C and Python
  - Introduction to Programming (AI)
  - Introduction to Programming (Bèta-Gamma)
  - Linear Algebra
  - Calculus and Optimisation
  - Information Visualization
  - Orientation on study and career
  - Scientific Programming
- Leading tutorials for approx. 30 first- and second year students

University of Amsterdam *Amsterdam, Netherlands*

Mentor *September 2021 - July 2022*

- Mentoring 30 second year students

Relevant Research

Geometric Algebra Simplicial Transformer *Amsterdam, Netherlands*

University of Amsterdam *2023*

- Project for the masters course Deep Learning 2
- The project aims to develop a new class of equivariant transformers by leveraging simplicial complexes and Clifford algebra to achieve equivariance to the full symmetry group.

Predicting Perceived Attributes of Urban Images using Low-dimensional Holistic Image Representations *Amsterdam, Netherlands*

University of Amsterdam *2022*

- Bachelor Thesis
- In this study, research is done into to what extent can GIST features be used to cluster Amsterdam's street scenes in a manner that captures their perceived attributes.

Robustness against Label Noise in Road Defect Severity Estimation *Amsterdam, Netherlands*

University of Amsterdam *2021*

- Project for the bachelor course Learning and deciding
- This study researches the challenges of using CNN's for automating road defect severity estimation: combining severity estimation with road defect classification and robustness to label noise.

Languages

Dutch	Native
English	Fluent, CEFR level C1

Interests

Cooking	Creating a dinner and enjoying the food with my friends while sharing stories, is one of my favorite activities. Ottolenghi is my inspiration
Surfing	The sport as well as the surfing culture touched my heart and ever since I first surfed in Sri Lanka in 2019, it became a big part of my life and played a major role during my time in South Africa
Music	This is my biggest hobby and passion, everything from producing music to playing guitar, piano and scoring videos. The ability to create and work together with others is something that I enjoy most
Art	Next to my love for music, I am passionate about other forms of art as well. Over the last few years, especially in South Africa, I discovered other means of expressing creativity. I started with photography in 2021 and at this moment I am in the process of making a documentary on Madagascar and a Township in Cape Town