Achilleas Leivadiotis

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PROFESSIONAL SUMMARY

ML engineer specializing in evaluation systems for safety-critical AI. Designed novel metrics linking 2D visual detections to 4D aircraft trajectories, achieving 71.75% attribution accuracy under real-world uncertainty at EUROCONTROL. Built simulation-driven stress tests, implemented and benchmarked multi-object tracking systems (MOTA, IDF1), and currently support production ML pipelines with regression detection. Seeking to apply rigorous evaluation methodology to autonomous driving at scale.

WORK EXPERIENCE

Software Engineer | EUROCONTROL MUAC **Nov 2025 - Present**

- Support and monitor COAV (Contrail Avoidance) production system serving real-world aircraft trials
- Diagnose regressions in ML predictions through systematic data analysis and pipeline debugging
- Work with large-scale trajectory data, Redis streams, and distributed system infrastructure

AI Research & Development | EUROCONTROL MUAC | Computer Vision | Thesis Grade 9/10 Feb 2025 - July 2025

- **Breakthrough Achievement:** Engineered first validated end-to-end AI pipeline for ground-based contrail monitoring
- **Evaluation Innovation:** Designed novel 4D→2D geometric projection metrics to evaluate flight attribution accuracy under partial observability and trajectory ambiguity
- **Model Benchmarking:** Implemented and quantitatively compared multi-object tracking systems—Norfair (43.3% MOTA, 67.9% IDF1) vs DeepSORT (11.3% MOTA, 45.5% IDF1)—with detailed error analysis to diagnose failure modes
- **Edge Case Discovery:** Built simulation-driven stress tests surfacing occlusions, intersecting trajectories, and temporal misalignment
- **Segmentation Pipeline:** Optimized Detectron2 Mask R-CNN achieving ~65% mask mAP; classified contrail morphology types with >90% accuracy
- **Impact:** First validated end-to-end AI pipeline for ground-based contrail monitoring, enabling assessment of aviation's climate contribution

Full-stack Developer | Freelance | Kassandra Properties VIP (Preview) July 2025 - Nov 2025

- Built real estate platform with Next.js 15, React 19, TypeScript; implemented auth, CMS, and admin dashboard

Software Developer Intern | Next Generation Sensors B.V. June 2024 - August 2024

- Tech Stack: TypeScript, Angular, MongoDB: Built a new website including support pages, authentication systems, admin dashboards, and client messaging tools
- Implemented secure RESTful APIs and database schemas to handle user data efficiently

PROGRAMMING / AI PROJECTS (3 Main)

I've worked on diverse AI and software engineering initiatives, ranging from a 3D MEP Component Location Predictor and an AI Image Detector (flagging AI-generated images) to a UNO Bot (with Monte Carlo and neural-network strategies) and an Image Recognition Hackathon. I also developed a rocket simulation with physics engines and a Graph Chromatic Number solver (JAVA).

Multiplayer Card Game (Live Demo) Mar 2025 - April 2025

- Architected WebSocket server handling concurrent game state, player synchronization, and disconnect recovery

3D MEP Component Location/Type Predictor | Equans S.A.S (Group Project 3-1) Sep 2024 – Jan 2025

- Built a proof-of-concept AI system that automatically places MEP (Mechanical, Electrical, Plumbing) components in a 3D Revit building model, predicting both (x,y,z) coordinates and type.
- Designed distance-based loss functions to quantify 3D placement errors
- Implemented specialized training loops with distance-based loss functions to quantify placement errors, successfully demonstrating the feasibility of an AI-driven approach to MEP component placement

AI Image Detector | Maastricht University Group Project 2-2, Grade: 9.5/10 Mar 2024 - Jul 2024

- Developed CNN and ResNet architectures to classify AI-generated images
- Built interpretability interface with heatmap visualizations of detection results

EDUCATION

Maastricht University | Data Science & Artificial Intelligence | GPA: 7.16/10 Graduated

Completed Modules: Calculus (9), Computer Security (9), Data Structures and Algorithms (9), Databases (7), Human Computer Interaction & Affective Computing (10), Introduction to Bio-Informatics (8), Large Scale IT and Cloud Computing (8), Machine Learning (6), Probability and Statistics (7), Simulation and Statistical Analysis (7), Software Engineering (7) & More

Anatolia College High School Sep 2019 – July 2022

- IB Diploma Program (2020–2022) and Lyceum/MYP Program prior

OTHER

Programming: Python, TypeScript, JavaScript, Java, SQL, MATLAB

Frontend: React, Next.js 15, Angular, Tailwind CSS, Responsive Design

Backend: Node.js, Express.js, FastAPI, REST APIs, GraphQL, WebSockets

Data Science/AI Libraries: Pandas, NumPy, scikit-learn, PyTorch, TensorFlow, OpenCV

Databases: PostgreSQL, MongoDB, Supabase, Prisma ORM

Authentication: JWT, OAuth, NextAuth, Supabase Auth

Cloud/DevOps: Vercel, Docker, CI/CD, GitHub Actions, Azure ML, Docker, Model Deployment