Alya ZOUZOU

+337 49 07 98 97 | alyasltd@gmail.com

 Linkedin | GitHub | Google Scholar

EDUCATION

- **University Paul Valéry, Montpellier III** *September 2025*
  Master's Degree in Mathematics & Computer Science Applied to Human and Social Sciences — Montpellier, France
  ◦ GPA: 3.7/4.00 Ranked: 2/17
  ◦ *Master Thesis: Trustworthy AI for Autonomous Visual Based Landing : Assessing Robustness, Explainability and Conformal Prediction for Runway Detection.*
- **University Paul Valéry, Montpellier III** *June 2023*
  Bachelor's Degree in Mathematics & Computer Science Applied to Human and Social Sciences — Montpellier, France
  ◦ Grade: 3.7/4.00 Ranked: 4/71

SKILLS

- **Machine Learning & Computer Vision:** YOLO, Conformal Prediction, Pose Estimation, mAP/C-mAP, Quantization-Aware Training (QAT), Model Explainability
- **Frameworks:** PyTorch, TensorFlow, Keras, Hugging Face
- **Data Engineering & Cloud:** AWS (S3, EC2), SQL, NoSQL, Alteryx, Data Visualization
- **Programming Languages:** Python, Java, R, Spark
- **Development Tools:** Git, GitHub, VS Code, Jupyter Notebook, Colab, Conda, Linux CLI
- **Web Technologies:** HTML, CSS, JavaScript

EXPERIENCE

- **Airbus AI Research []** *Sept 2024 - Sept 2025*
  Research Intern in Computer Vision & Trustworthy AI — Toulouse, France
  ◦ Achieved **99.5% mAP@0.5** for runway detection on LARD by fine-tuning YOLO variants and automating hyperparameter search; developed **Conformal-mAP** for robustness assessment.
  ◦ Used conformal prediction to increase robustness by **+55 pts C-mAP** (from $< 2\%$ to ~ 53–57%) while maintaining standard $\text{mAP} > 92\%$.
  ◦ Applied calibrated conformal bounding boxes to ensure **73–77%** full-coverage reliability at $\alpha = 0.3$ (IoA=1).
  ◦ Prototyped toward End-to-end pose-aware models with **YOLO-NAS-POSE**; improved mean keypoint confidence $0.27 \rightarrow$ **0.76** (+180%) using COCO-POSE transfer learning and halved training time.
  ◦ Built a reproducible PyTorch training stack (dataset conversion, S3/ingestion, Optuna sweep runner, model bank) to scale experiments on AWS.
- **Airbus []** *Sept 2023 - Sept 2024*
  Intern in Natural Language Processing (NLP) — Toulouse, France
  ◦ Fine-tuned BART to generate **schema-valid JSON** from ATIS aviation messages; evaluated exact-match and structural validity for downstream integration.
  ◦ Benchmarked parameter-efficient vs. full fine-tuning.
- **PricewaterhouseCoopers (PwC)[]** *April 2023 - July 2023*
  Data Analyst Intern — Montpellier, France
  ◦ Designed interactive dashboards for audit-mission oversight, applying visualization best practices.
  ◦ Streamlined reporting by aggregating and processing internal data in Alteryx to improve reliability and efficiency.

PROJECTS

- **FootCVision: A Computer Vision App applied to Football** *December 2024*
  Tools: Python, Pytorch, OpenCV, YOLO []
  ◦ Built a modular pipeline (detection $\rightarrow$ tracking $\rightarrow$ team-ID) with optional conformal ensembling to surface uncertainty alongside predictions.
- **StreamiManga: A Dive into Anime Data, Quizzes, Recommendations, and Creativity!** *October 2024*
  Tools: Streamlit, Python, HuggingFace, PySpark []
  ◦ Integrated data analysis, ML, and diffusion-based generation into an interactive Streamlit app for trend exploration, quizzes, and personalized recommendations.

RESEARCH PUBLICATIONS C=CONFERENCE, J=JOURNAL, P=PATENT, S=IN SUBMISSION, T=THESIS

[C.1] ZOUZOU, et al. (2025). **Robust Vision-Based Runway Detection through Conformal Prediction and Conformal mAP**. In *Proceedings of Machine Learning Research*, pp. 266:1–20. Conformal and Probabilistic Prediction with Applications. Selected for Oral Presentation in London.

[C.1] ZOUZOU, et al. (2024). **INM-Explain – Explaining Medical Controversies: Application to the Case of Non-Drug Interventions**. Presented at *Health and AI Day @ PFIA2024 Conference* on 07/01/24, La Rochelle, France.

ADDITIONAL INFORMATION

Languages: English (C1), French (Native)
Interests: Sport, Writing, Travelling