Charles Corbière

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Postdoctoral researcher in multimodal AI for safety-critical systems.

EDUCATION

Ph.D. in Computer Science   2019 – 2022
Conservatoire National des Arts et Métiers   *Paris, France*
- Advisors: Prof. Nicolas Thome (CNAM) and Dr. Patrick Pérez (valeo.ai).
- Manuscript: *Robust and multi-modal deep learning for autonomous driving.*
- Topics: uncertainty estimation, domain adaptation, robustness to distribution shift.

2 top-tier publications (NeurIPS, T-PAMI) + 2 workshops publications (ICML, ECCV).

M.Sc. in Applied Mathematics   2016 – 2017
École Polytechnique, Université Paris-Saclay   *Paris, France*

Coursework: machine learning, optimization, deep learning, big data analytics, graphical models, statistical learning, computer vision, compressed sensing. Full course list *here*.

M.Eng. in Computer Science   2012 – 2016
École Centrale de Lille   *Lille, France*
- Major: Software Engineering, Minor in Entrepreneurship.
- Solid foundations in mathematics and engineering (electronics, embedded systems).

Classe Préparatoire aux Grandes Ecoles - MPSI/MP   2010 – 2012
Lycée du Parc   *Lyon, France*

Two-year intensive program preparing for nationwide competitive exams to enter French's elite Grandes Ecoles in science. Coursework: mathematics, physics, chemistry, computer science.

WORK EXPERIENCE

Postdoctoral Researcher   Nov. 2022 – present
École Polytechnique Fédérale de Lausanne (EPFL)   *Lausanne, Switzerland*

Visual Intelligence for Transportation (VITA) Lab, led by Prof. Alexandre Alahi
- Collaborative project with the NLP Lab to leverage vision-language models for autonomous driving.
- Project lead for a 6-person team building a dataset for depth estimation from omnidirectional cameras.

2 on-going submissions to CVPR 2025

Junior Research Scientist   Jan. 2019 – Feb. 2022
valeo.ai   *Paris, France*
- CIFRE PhD fellow researching on reliability, domain adaptation and robustness.
- Published peer-reviewed papers in top-tier AI conferences and journals.
- Collaborated with internal industrial teams to integrate my research into automotive solutions.

Computer Vision Engineer   Oct. 2017 – Nov. 2018
Preligens   *Paris, France*
- Developed and deployed a semantic segmentation pipeline for detecting small and numerous objects in satellite imagery.
- Conducted exploratory research on semi-supervised and weakly supervised learning.

Research Intern   Apr. –Sept. 2017
Heuritech   *Paris, France*
Subject: build a learning scheme to improve feature representation for fashion and e-commerce images.
1 workshop publication (ICCV)

Publications

C. Corbière*, S. Roburin*, S. Montariol*, A. Bosselut, and A. Alahi, "Drivingvqa: Benchmarking visual chain-of-thought reasoning with driving theory tests," 2024. *Under submission at CVPR.*

M. Zayene, J. Endres, A. Havolli, **C. Corbière**, S. Cherkaoui, A. Kontouli, and A. Alahi, "Helvipad: A real-world dataset for omnidirectional stereo depth estimation," 2024. *Under submission at CVPR.*

C. Corbière, S. Roburin, S. Montariol, A. Bosselut, and A. Alahi, "Drivingvqa: Benchmarking visual chain-of-thought reasoning with driving theory tests," 2024. *Under submission at CVPR.*

S. Roburin*, **C. Corbière***, G. Puy, N. Thome, M. Aubry, R. Marlet, and P. Pérez, "Take one gram of neural features, get enhanced group robustness," in *ECCV Workshop on Out-Of-Distribution Generalization in Computer Vision*, 2022.

C. Corbière, M. Lafon, N. Thome, M. Cord, and P. Pérez, "Beyond first-order uncertainty estimation with evidential models for open-world recognition," in *ICML Workshop on Uncertainty and Robustness in Deep Learning*, 2021.

C. Corbière, N. Thome, A. Saporta, T.-H. Vu, M. Cord, and P. Pérez, "Confidence estimation via auxiliary models," in *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 2021.

C. Corbière, N. Thome, A. Bar-Hen, M. Cord, and P. Pérez, "Addressing failure prediction by learning model confidence," in *Advances in Neural Information Processing Systems 32 (NeurIPS)*, pp. 2902–2913, 2019.

C. Corbière, H. Ben-Younes, A. Rame, and C. Ollion, "Leveraging weakly annotated data for fashion image retrieval and label prediction," in *IEEE International Conference on Computer Vision Workshop (ICCVW)*, pp. 2268–2274, 10 2017.

Skills

Programming Languages: Python, Bash/Shell, SQL
Libraries: pytorch, tensorflow, keras, open-cv, scikit-learn, gdal, numpy, scipy, matplotlib
Tools: Linux, Docker, git, Jupyter, PyCharm, Notion
Languages: French (native), English (fluent), Spanish (conversational)

Teaching and Academic Services

o **Reviewer** at ICCV, ICLR, T-PAMI, Transportation Research Part C.
o **Project Supervisor** *(2022 – 2024)*: Supervised master's students for their semester projects.
o **Supervising Assistant** *(2023 – 2024)*: Guided master's students on group projects for Deep Learning for Autonomous Vehicles (DLAV) course at EPFL.

o **Teaching Assistant** *(2020 – 2022)*: Conducted practical sessions on Bayesian modeling for 60 students in the Master's program in Data Science (RDFIA) at Sorbonne Université, in collaboration with my supervisor Prof. Nicolas Thome.

Others Activities

o President of a 500-person electronic music festival, leading a core team of 15 and managing 80+ on-site staff.

o Active member of a theatre company, participating in performances and creative projects.

o Co-founder of a blog focused on ethics in artificial intelligence and data science, active until 2019.

o Travelling around the world – 2022: 5-months in South America

o Sports enthusiast: running, football player and former basketball playmaker.