Arthur **Ouaknine**

Postdoctoral researcher fellow

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Summary

I am a postdoctoral researcher fellow at McGill University and Mila (Quebec Artificial Intelligence Institute), in collaboration with Prof. David Rolnick and Prof. Etienne Laliberté. My research projects are focused on computer vision for biodiversity monitoring, in particular with multi-modal and multi-task deep learning for remote sensing applied to forest monitoring. I am co-founder and chief technical officer (CTO) of Rubisco AI, a Mila startup that aims to monitor forests at scale. I was also a volunteer and core team member of the non-profit organization Climate Change AI.

I hold the IVADO Postdoc Entrepreneur Fellowship, which supports my innovative work in forest monitoring. My expertise spans deep learning, computer vision, and remote sensing, with a strong emphasis on sustainability and environmental impact.

I completed my Ph.D. in March 2022 in collaboration between Institut Polytechnique de Paris (Telecom Paris; Image, Data and Signal department) and Valeo.ai (international research center in artificial intelligence applied to autonomous driving). The aim of my work was to use and adapt deep neural network architectures for scene understanding using automotive radar data and multi-sensor fusion.

Experience

McGill University & Mila

Montreal, Quebec, Canada

Postdoctoral researcher fellow — *Sep 2022 - Now*

- Topic: Deep learning and computer vision for multi-modal and multi-task learning for remote sensing applied to forest monitoring.
- Managing research projects of Master and Ph.D. students at Mila.
- Publications in **top-tier machine learning and computer vision conferences** (NeurIPS, AAAI) and journals (see Publications section).
- Active contributions on open access datasets and open source code, such as:
  - **OpenForest**: A review of datasets and machine learning methods for forest monitoring.
  - **FoMo-Bench**: A multi-modal, multi-task and multi-scale forest monitoring benchmark for remote sensing foundation models and a general method processing data from any spectral bands and resolutions.
  - **CanopyRS** & **geodataset**: A Python toolbox for raster preprocessing, inference, postprocessing and standardize for individual tree crown detection and segmentation.
- Former member of the sustainability committee of Mila.
- Granted with the **IVADO Postdoc Entrepreneur Fellowship** to support my innovative work in forest monitoring.

Rubisco AI

Montreal, Quebec, Canada

Co-founder & CTO — *May 2024 - Now*

- Topic: Monitoring of forest restoration projects with high resolution drone imagery and carbon stock estimation of individual trees.
- Deployment of individual tree instance segmentation models on AWS GPU instances through Docker containers.
- Development of the frontend and backend of our minimal viable product with Python, JavaScript, CSS and HTML. Work in progress.
- Visualization of a proof of concept is available at `https://rubisco.ai/demo/`.

Climate Change AI

Remote

Core team member (Volunteer - Non-profit) — *Feb 2023 - May 2025*

- Co-lead organizer of the 'Tackling Climate Change with Machine Learning' workshop at ICLR 2024 (Vienna, Austria).
  - Over 120 research articles submitted, 75 accepted including 7 spotlights and 3 best paper awards. All accepted works are available here.
  - Managing over 120 reviewers and 19 meta-reviewers.
  - Organizing the day-of event: 11 speakers (2 keynotes, 2 panels), 9 spotlights (including tutorials).
  - Audience of 150 people on-site and over 600 people online.
- Co-organizer of the 'Tackling Climate Change with Machine Learning' workshop at NeurIPS 2024 (Vancouver, Canada).
- Lead the webinars team. Average of one event per month with an audience of 50 to 100 people.

Valeo.ai

Paris, France

Ph.D. Student in Deep Learning — *Jan 2019 - Mar 2022*

- Creation of the CARRADA open source dataset for scene understanding with camera and radar data. Code and data are available at `https://github.com/valeoai/carrada_dataset`.
- Creation of deep neural network architectures with their associated loss functions for multi-view radar semantic segmentation. Code and pre-trained models are available at `https://github.com/valeoai/MVRSS`.
- Co-creation of a deep neural network architecture for HD radar preprocessing estimation and multi-task learning.
- Preliminary work on multi-sensor fusion for self-supervised learning.
- Accepted articles at **ICPR 2020, ICCV 2021 and CVPR 2022**. See publications section for further details.
- Teaching assistant in computer vision and machine learning. Co-supervisor of student projects (1 to 4 students): radar semantic segmentation, SAR image denoising, iceberg segmentation and tracking, deforestation detection (optical and SAR images). Details are available here.
- Co-organizer of the Deep Learning Working Group of the IMAGES team at Telecom Paris.

Valeo.ai

Paris, France

Research Engineer — *Sep 2018 - Dec 2018*

- Lead discussions between Valeo and Telecom team members about radar theory and data.
- Creation of a radar simulator for data generation and classification of the simulated data using deep learning.

Faircast
Paris, France

Research Engineer (Freelance) *Jun 2018*

- Using Superpoint Graph (L. Landrieu & M. Simonovsky, CVPR 2018) for LiDAR 3D point cloud segmentation for object removal.

Zyl
Saint-Maur-des-Fossés, France

Computer Vision Engineer *Sep 2017 - Mar 2018*

- Application of deep learning methods for computer vision (object detection) embedded on smartphone (compression).
- Deep Learning modelling for Visual Sentiment Analysis (D. Borth et al., ACM 2013) and transfer learning.
- Reviews of deep learning methods for image classification, object detection and model compression. See publication section for further details.

Idemia
Paris, France

Data Science Project *Oct 2016 - Jun 2017*

- Facial keypoint detection using deep neural networks with a few number of labelled data.
- Active learning process with uncertainty quantification for training optimization using Monte Carlo Dropout (Y. Gal and Z. Ghahramani, ICML 2016).

Rexel
Paris, France

Data Scientist *Apr 2016 - Sep 2016*

- Machine learning modelling for client targeting (churn probability prediction, elasticity estimation, commercial visit optimisation).
- Text mining analysis to target clients discontent.
- Machine learning for attrition prediction: churn probability prediction covering a large part of sale revenues, churn cause analysis.

Enedis
Paris, France

Data Analyst *Apr 2015 - Sep 2015*

- Text mining analysis, database structuring and predictive modelling.

Education

Institut Polytechnique de Paris - Telecom Paris
Palaiseau, France

Ph.D. in Deep learning and computer vision *2019 - 2022*

- Supervised by P. Pérez (valeo.ai), F. Tupin (Telecom Paris) and A. Newson (Telecom Paris).
- *Subject*: "Scene understanding using deep learning algorithms applied to radar data for autonomous driving".
- Accepted articles at **ICPR 2020, ICCV 2021 and CVPR 2022**. See publications section for further details.
- *Keywords*: deep learning algorithms, signal processing, computer vision, Range-Angle-Doppler representations, semantic segmentation.

Telecom Paris
Palaiseau, France

Post M.Sc. Machine Learning (with Highest Honors) *2017- 2018*

- *Keywords*: Machine Learning, Big Data and Distributed Systems (Spark, Hadoop).
- *Data Science Project*: "Active learning for facial keypoint detection using deep learning".

Paris Pantheon-Sorbonne University
Paris, France

M.Sc. Statistical Modelling (with Honors) *2014 - 2016*

Paris Diderot University
Paris, France

B.S. Applied Mathematics *2011 - 2014*

Publications

Conferences & journals

- M. Teng, **A. Ouaknine**, E. Laliberté, Y. Bengio, D. Rolnick, H. Larochelle, **Bringing SAM to new heights: Leveraging elevation data for tree crown segmentation from drone imagery**, In NeurIPS 2025.
- E. Cherif, **A. Ouaknine**, L. A. Brown, P. D. Dao, K. R. Kovach, B. Lu, D. Mederer, H. Feilhauer, T. Kattenborn, D. Rolnick, **GreenHyperSpectra: A multi-source hyperspectral dataset for global vegetation trait prediction**, In NeurIPS 2025.
- N. I. Bountos, **A. Ouaknine**, Ioannis Papoutsis, D. Rolnick, **FoMo-Bench: a multi-modal, multi-scale and multi-task forest monitoring benchmark for remote sensing foundation models**, AAAI 2025.
- V. Ramesh, **A. Ouaknine**, D. Rolnick, **Tree semantic segmentation from aerial image time series**, In Environmental Data Science 2025.
- **A. Ouaknine**, T. Kattenborn, E. Laliberté, D. Rolnick, **OpenForest: A data catalogue for machine learning in forest monitoring**, In Environmental Data Science 2024.
- J. Rebut, **A. Ouaknine**, W. Malik and P. Pérez, **Raw High-Definition Radar for Multi-Task Learning**, In CVPR 2022.
- **A. Ouaknine**, A. Newson, P. Pérez, F. Tupin and J. Rebut, **Multi-View Radar Semantic Segmentation**, In ICCV 2021.
- **A. Ouaknine**, A. Newson, J. Rebut, F. Tupin and P. Pérez, **CARRADA: Camera and Automotive Radar Dataset with Semi-Automatic Range-Angle-Doppler Annotations**. In ICPR 2020.

Under review

- H. Baudchon, **A. Ouaknine**, M. Weiss, M. Teng, T. R. Walla, A. Caron-Guay, C. Pal, E. Laliberté, **SelvaBox: A high-resolution dataset for tropical tree crown detection**, In ArXiv 2025.

Thesis

- **A. Ouaknine**, **Deep Learning for Radar Data Exploitation of Autonomous Vehicle**, 2022.

Blog posts

- A. Ouaknine, **Review of Deep Learning Algorithms for Image Semantic Segmentation**, *Medium*, *December 2018*.
- A. Ouaknine, **Deep Learning Model Compression for Image Analysis: Methods and Architectures**, *Medium*, *March 2018*.
- A. Ouaknine, **Review of Deep Learning Algorithms for Object Detection**, *Medium*, *February 2018*.
- A. Ouaknine, **Review of Deep Learning Algorithms for Image Classification**, *Medium*, *January 2018*.

Invited talks

Conferences and workshops

- Φ-**lab** seminar, remote. To be announced.
- Keynote speaker at NAFGS conference, in Québec, Canada. June 2026.
- **Norlab** seminar, in Québec, Canada. March 2026.
- **LASTIG lab** seminar of the National Institute of Geographic and Forest Information (IGN), in Champs-sur-Marne, France. July 2025.
- Keynote speaker at **CMCC workshop on AI for Carbon** in Como, Italy. July 2025.
- Keynote speaker at **Yale Center for Natural Carbon Capture** Spring Symposium, in New Haven, USA. May 2025.

Others

- Mila Entrepreneurs' Night on AI for Climate, in Montréal, Canada. June 2024.

Skills

Languages

- French (native), English (fluent).

Coding & frameworks

- Languages: Python, Java, R, javascript, SQL, NoSQL, C++, Scala, VBA.
- Deep learning frameworks: PyTorch, Tensorflow, Keras.
- Software development: Linux, Docker, Github, CircleCI, Sphinx.

Interests

Research community

- Co-organizer of the 'Tackling Climate Change with Machine Learning' workshops at ICLR 2024 (co-lead) and NeurIPS 2024.
- Reviewer in machine learning conferences: NeurIPS, ICML, ICLR.
- Reviewer in computer vision conferences: CVPR, ICRA.
- Meta-reviewer at the 'Tackling Climate Change with Machine Learning' workshop at NeurIPS 2024.

Volunteering

- Volunteer as a core team member of Climate Change AI, a non-profit organization disseminating impactful work at the intersection of climate change and artificial intelligence.

Sports

- Running: 10km - 36:05 (Boucherville, Canada 2025); Half-marathon - 1:19:31 (Montréal, Canada 2025); Marathon - 2:52:47 (Montréal, Canada 2024).
- Others: Bouldering, hiking, english boxing.

Travels

- Western and Eastern Europe, Canada, Mexico, USA, Guatemala, Argentina, Bolivia, Colombia, Peru, Marocco, Cape Verde, Cambodia, Vietnam, Indonesia, Thailand.