Alexandre **Ramé**

STUDENT RESEARCHER AT GOOGLE DEEPMIND. PHD IN DEEP LEARNING.
INVESTIGATING HOW THE OUT-OF-DISTRIBUTION GENERALIZATION LITERATURE CAN HELP TO ALIGN MULTIMODAL AIS WITH THE WORLD *in all its diversity*.

Paris, France

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Education

PhD in Computer Science and Deep Learning
SORBONNE UNIVERSITY (ISIR, MLIA)   *Advisor: Pr. Matthieu Cord*

Paris, France
Mar 2020 - Oct 2023

- PhD title: *Diverse and Efficient Ensembling of Deep Networks*.
- Topics: ensembling, weight averaging, robustness, out-of-distribution generalization, continual learning and alignment.

Master of Science in Operations Research GPA: 3.9 / 4.0
COLUMBIA UNIVERSITY

New York, USA
Sep 2014 - May 2015

- Majors: optimization and machine learning.
- Minors: deep learning, statistics and programming.

Diplôme d'Ingénieur Polytechnicien GPA: 3.7 / 4.0
ECOLE POLYTECHNIQUE

Palaiseau, France
Sep 2011 - May 2014

- Major in applied mathematics: optimization, probability, statistics, stochastic finance and times series analysis.
- Minors: computer science, economics, physics, entrepreneurship and mathematics.

MPSI - MP* Info
LYCÉE SAINTE-GENEVIÈVE

Versailles, France
Sep 2009 - Jul 2011

Mathematics, physics and computer science.

Experience

Google DeepMind
STUDENT RESEARCHER   *Advisor: Dr. Johan Ferret*

Paris, France
Oct 2023 - Jan 2024

- Improving the robustness of reward models for RLHF.

FAIR Meta AI
RESEARCH SCIENTIST INTERN IN THE FAIRNESS AND ROBUSTNESS TEAM   *Advisor: Dr. David Lopez-Paz and Dr. Léon Bottou*

Paris, France
Sep 2022 - Feb 2023

- Investigating how weight averaging strategies can improve out-of-distribution generalization.
- Exploring how the updatable machine learning paradigm can help for embarrassingly simple parallelization of large-scale trainings.

Heuritech
RESEARCH SCIENTIST IN DEEP LEARNING   *Advisor: Dr. Charles Ollion*

Paris, France
Jan 2016 - Nov 2019

- Main contributor of the computer vision pipeline. Implementing and improving deep classification and detection models.

Flaminem
RESEARCH SCIENTIST IN MACHINE LEARNING

Paris, France
Sep 2015 - Dec 2015

- Big data challenges to predict long-term purchase decision.

Selected Publications

Rewarded Soups: Towards Pareto-Optimal Alignment by Interpolating Weights Fine-tuned on Diverse Rewards
ALEXANDRE RAMÉ, GUILLAUME COUAIRON, CORENTIN DANCETTE, JEAN-BAPTISTE GAYA, MUSTAFA SHUKOR, LAURE SOULIER, MATTHIEU CORD

NeurIPS

2023

Beyond task performance: Evaluating and reducing the limitations of large multimodal models with in-context-learning?
MUSTAFA SHUKOR, ALEXANDRE RAMÉ, CORENTIN DANCETTE, MATTHIEU CORD

arXiv

2023

UniVAL: Unified Model for Image, Video, Audio and Language Tasks   *TMLR*

Mustafa Shukor, Corentin Dancette, <u>Alexandre Ramé</u>, Matthieu Cord   *2023*

Model Ratatouille: Recycling Diverse Models for Out-of-Distribution Generalization   *ICML*

<u>Alexandre Ramé</u>, Kartik Ahuja, Jianyu Zhang, Matthieu Cord, Léon Bottou, David Lopez-Paz   *2023*

Diverse Weight Averaging for Out-of-Distribution Generalization   *NeurIPS*

<u>Alexandre Ramé</u>, Matthieu Kirchmeyer, Thibaud Rahier, Alain Rakotomamonjy, Patrick Gallinari, Matthieu Cord   *2022*

DyTox: Transformers for Continual Learning with DYnamic TOken eXpansion   *CVPR*

Arthur Douillard, <u>Alexandre Ramé</u>, Guillaume Couairon, Matthieu Cord   *2022*

Fishr: Invariant Gradient Variances for Out-of-distribution Generalization   *ICML*

<u>Alexandre Ramé</u>, Corentin Dancette, Matthieu Cord   *2022*

MixMo: Mixing Multiple Inputs for Multiple Outputs via Deep Subnetworks   *ICCV*

<u>Alexandre Ramé</u>, Remy Sun, Matthieu Cord   *2021*

DICE: Diversity in Deep Ensembles via Conditional Redundancy Adversarial Estimation *ICLR*

<u>Alexandre Ramé</u>, Matthieu Cord   *2021*

OMNIA Faster R-CNN: Detection in the Wild through Dataset Merging and Soft Distillation *arXiv*

<u>Alexandre Ramé</u>, Emilien Garreau, Hedi Ben-Younes, Charles Ollion   *2018*

Leveraging Weakly Annotated Data for Fashion Image Retrieval and Label Prediction   *ICCVW*

Charles Corbiere, Hedi Ben-Younes, <u>Alexandre Ramé</u>, Charles Ollion   *2017*

Teaching

Teacher Assistant

Sorbonne Université · *Master level* · Deep Learning for Computer Vision   *Fall 2020 / Fall 2021*

Teacher Assistant

Data Science l'X-Paris Saclay · *Master level* · Deep Learning   *Fall 2017 / Fall 2018*

Volunteer Teacher and Youth Leader

Fondation D'Auteuil Sannois · Mathematics   *Nov 2011 - Mar 2012*

Skills

- **Programming Languages**:   Python · Shell · Scala · R
- **Packages**:   PyTorch · JAX · Tensorflow / Keras · Theano · Scikit-Learn · Numpy · Pandas
- **Tools & OS**:   Linux · Latex · Git · Jupyter/Colab · Vim · VSCode
- **Languages**:   French (native) · English (fluent) · Spanish (beginner)
- **Reviewing**:   NeurIPS (top reviewer 2023) · ICLR · CVPR · CoLLAs · IJCV

Main Talks

ENPC Imagine, Paris Diverse and efficient ensembling of deep networks   *Nov 2023*

INRIA Sierra, Paris Diverse and efficient ensembling of deep networks   *Nov 2023*

Valeo.ai, Paris Diverse and efficient ensembling of deep networks   *Sept 2023*

INRIA THOTH, Grenoble Weight Averaging for Generalization and Alignment *July 2023*

Samsung (SAIL), Montréal (Canada) Weight Averaging and Diversity for Generalization *June 2023*

ECML KDD, Grenoble A Bias-Variance Analysis of Out-of-Distribution Generalization *Sep 2022*

Facebook AI Research, Paris Fishr for Domain Generalization *Oct 2021*

Valeo.ai, Paris Dice for Diversity in Deep Ensembles *Mar 2021*

Paris Deep Learning Meetup #16, Paris OMNIA Faster R-CNN for Semi-Supervised Object Detection *Jan 2019*

Paris Deep Learning Meetup #6, Paris Correlational Neural Networks for Multilingual Embeddings *Feb 2017*