

Alexandre Ramé

RESEARCH SCIENTIST AT GOOGLE DEEPMIND. PHD IN DEEP LEARNING AT SORBONNE UNIVERSITÉ.

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

Paris, France

SORBONNE UNIVERSITY (ISIR, MLIA) Advisor: Pr. Matthieu Cord

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

New York, USA

COLUMBIA UNIVERSITY

Sep 2014 - May 2015

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

Diplôme d'Ingénieur Polytechnicien GPA: 3.7 / 4.0

Palaiseau, France

ECOLE POLYTECHNIQUE

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

Versailles, France

LYCÉE SAINTE-GENEVIÈVE

Sep 2009 - Jul 2011

Mathematics, physics and computer science.

Experience

Google DeepMind

Paris, France

RESEARCH SCIENTIST Advisor: Dr. Olivier Bachem

Mar 2023 -

- RLHF Alignment of Gemini LMMs for improved quality and safety.
- Reward modeling and reinforcement learning.

Google DeepMind

Paris, France

STUDENT RESEARCHER Advisor: Dr. Johan Ferret

Oct 2023 - Jan 2024

- Improving the robustness of reward models for RLHF.

FAIR Meta AI

Paris, France

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

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

Paris, France

RESEARCH SCIENTIST IN DEEP LEARNING Advisor: Dr. Charles Ollion

Jan 2016 - Nov 2019

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

Flaminem

Paris, France

RESEARCH SCIENTIST IN MACHINE LEARNING

Sep 2015 - Dec 2015

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

Selected Publications

WARM: On the Benefits of Weight Averaged Reward Models

ALEXANDRE RAMÉ, NINO VIEILLARD, LÉONARD HUSSENOT, ROBERT DADASHI, GEOFFREY CIDERON, OLIVIER BACHEM, JOHAN FERRET

arXiv

2024

Beyond task performance: Evaluating and reducing the limitations of large multimodal models with in-context-learning?

MUSTAFA SHUKOR, ALEXANDRE RAMÉ, CORENTIN DANCETTE, MATTHIEU CORD

ICLR

2024

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

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

MUSTAFA SHUKOR, CORENTIN DANCETTE, ALEXANDRE RAMÉ, MATTHIEU CORD

TMLR

2023

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

ALEXANDRE RAMÉ, KARTIK AHUJA, JIANYU ZHANG, MATTHIEU CORD, LÉON BOTTOU, DAVID LOPEZ-PAZ

ICML

2023

Diverse Weight Averaging for Out-of-Distribution Generalization

ALEXANDRE RAMÉ, MATTHIEU KIRCHMEYER, THIBAUD RAHIER, ALAIN RAKOTOMAMONJY, PATRICK GALLINARI, MATTHIEU CORD

NeurIPS

2022

DyTox: Transformers for Continual Learning with DYnamic TOken eXpansion

ARTHUR DOUILLARD, ALEXANDRE RAMÉ, GUILLAUME COUAIRON, MATTHIEU CORD

CVPR

2022

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

ALEXANDRE RAMÉ, CORENTIN DANCETTE, MATTHIEU CORD

ICML

2022

MixMo: Mixing Multiple Inputs for Multiple Outputs via Deep Subnetworks

ALEXANDRE RAMÉ, REMY SUN, MATTHIEU CORD

ICCV

2021

DICE: Diversity in Deep Ensembles via Conditional Redundancy Adversarial Estimation

ALEXANDRE RAMÉ, MATTHIEU CORD

ICLR

2021

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

ALEXANDRE RAMÉ, EMILIEN GARREAU, HEDI BEN-YOUNES, CHARLES OLLION

arXiv

2018

Leveraging Weakly Annotated Data for Fashion Image Retrieval and Label Prediction

CHARLES CORBIERE, HEDI BEN-YOUNES, ALEXANDRE RAMÉ, CHARLES OLLION

ICCVW

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) · ICML · ICLR · CVPR · CoLLAs · IJCV

Main Talks

GOOGLE DEEPMIND, PARIS EFFICIENT, RELIABLE AND ROBUST REWARD MODELS WITH WEIGHT AVERAGING	<i>Dec 2023</i>
ENPC IMAGINE, PARIS DIVERSE AND EFFICIENT ENSEMBLING OF DEEP NETWORKS	<i>Nov 2023</i>
INRIA SIERRA, PARIS DIVERSE AND EFFICIENT ENSEMBLING OF DEEP NETWORKS	<i>Nov 2023</i>
VALEO.AI, PARIS DIVERSE AND EFFICIENT ENSEMBLING OF DEEP NETWORKS	<i>Sept 2023</i>
INRIA THOTH, GRENOBLE WEIGHT AVERAGING FOR GENERALIZATION AND ALIGNMENT	<i>July 2023</i>
SAMSUNG SAIL, MONTRÉAL (CANADA) WEIGHT AVERAGING AND DIVERSITY FOR GENERALIZATION	<i>June 2023</i>
ECML KDD, GRENOBLE A BIAS-VARIANCE ANALYSIS OF OUT-OF-DISTRIBUTION GENERALIZATION	<i>Sep 2022</i>
FACEBOOK AI RESEARCH, PARIS FISHR FOR DOMAIN GENERALIZATION	<i>Oct 2021</i>
VALEO.AI, PARIS DICE FOR DIVERSITY IN DEEP ENSEMBLES	<i>Mar 2021</i>
PARIS DEEP LEARNING MEETUP #16, PARIS OMNIA FASTER R-CNN FOR SEMI-SUPERVISED OBJECT DETECTION	<i>Jan 2019</i>
PARIS DEEP LEARNING MEETUP #6, PARIS CORRELATIONAL NEURAL NETWORKS FOR MULTILINGUAL EMBEDDINGS	<i>Feb 2017</i>