

Arthur Douillard

SENIOR RESEARCH SCIENTIST AT DEEPMIND (LONDON, UK)

Paris, France

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Education

PhD in Computer Science

Paris, France

SORBONNE UNIVERSITY (MLIA TEAM) *Advisor: Pr. Matthieu Cord*

Jul 2019 - June 2022

- PhD thesis on Continual Learning for Computer Vision.

M.S. in Computer Science (*Diplôme d'ingénieur*) Major GPA: 3.7 / 4.0

Paris, France

EPITA *Advisor: Pr. Reda Dehak*

2014 - 2018

- Machine Learning, Deep Learning, NLP, Python, C++, Golang, Scala/Kafka/Spark, Image processing, Text Mining
- Stats & Proba, Linear Algebra, Convex Optimization, Logic

Experience

DeepMind

London, UK

SENIOR RESEARCH SCIENTIST *Advisor: Dr. Marc'Aurelio Ranzato*

October 2023 - Now

- Research in the Continual Learning team, lead of the distributed modularity.

RESEARCH SCIENTIST

August 2022 - September 2023

- Research in the Continual Learning team.

Heuritech

Paris, France

RESEARCH SCIENTIST *Advisor: Dr. Charles Ollion, Dr. Thomas Robert*

July 2019 - June 2022

- Improving SotA models in production and advising the R&D team.

RESEARCH ENGINEER

Advisor: Alexandre Ramé

Sept 2018 - June 2019

- Developed novel attention mechanisms leading up to a new proposed vertical (logo detection in the wild).
- Developed hard negative mining for metric-based models, and multi-modal image retrieval.
- Speed up training time of DNNs by 10x and inference time by up to 5x.
- Implemented numerous research papers in production leading to better forecast our product.

Dataiku

Paris, France

RESEARCH ENGINEER INTERN *Advisor: Dr. Léo Dreyfus-Schmidt*

Feb - Aug 2018

- Implemented deep learning models for computer vision (transfer learning, detection, training schedules, fewshot, autoML, speech recognition, etc.) that were integrated to the Dataiku platform.
- Won the 1st & 2nd prize of the NATO Innovation Challenge as the lead scientist of my team with object detection on satellite imagery.
- Organized & presented internal conferences on deep learning.

ZebraIA

Paris, France

GRADUATE STUDENT RESEARCHER *Advisor: Dr. Guillaume Palacios*

Aug 2017 - Jan 2018

- Implemented Deep Learning NLP papers for a medical chatbot (word2vec, pos-tagging, sentence classification, data augmentation).

MyDrive Solutions

London, UK

DATA SCIENTIST INTERN *Advisor: Dr. Zoulficar S. Younes*

Sept 2016 - Jan 2017

- Migrated the mapping database from Here Maps to OpenStreetMaps reducing cost by 6 figures £
- Analyzed and applied Machine Learning models on driver and medical data in Python (Pandas, Scikit-Learn, Keras) and R for clients across the world (England, Italy, France, Indonesia)

Publications

Warp: On the benefits of weight averaged rewarded policies

arXiv

ALEXANDRE RAMÉ, JOHAN FERRET, NINO VIEILLARD, ROBERT DADASHI, LÉONARD HUSSENOT, PIERRE-LOUIS CEDOZ, PIER GIUSEPPE SESSA, SERTAN

2024

GIRGIN, ARTHUR DOUILLARD, OLIVIER BACHEM

A mechanism-based approach to mitigating harms from persuasive generative AI

arXiv

SELIM EL-SAYED, CANFER AKBULUT, AMANDA MCCROSKERY, GEOFF KEELING, ZACHARY KENTON, ZARIA JALAN, NAHEMA MARCHAL, ARIANNA MANZINI,

TOBY SHEVLANE, SHANNON VALLOR, DANIEL SUSSER, MATIJA FRANKLIN, SOPHIE BRIDGERS, HARRY LAW, MATTHEW RAHTZ, MURRAY SHANAHAN, MICHAEL

2024

HENRY TESSLER, ARTHUR DOUILLARD, TOM EVERITT, SASHA BROWN

DiPaCo: Distributed Path Composition

arXiv

ARTHUR DOUILLARD*, QIXUAN FENG*, ANDREI A. RUSU*, ADHIGUNA KUNCORO, YANI DONCHEV, RACHITA CHHAPARIA, IONEL GOG, MARC'AURELIO

2023

RANZATO, JIAJUN SHEN, ARTHUR SZLAM

Asynchronous Local-SGD Training for Language Modeling

ICML Workshop (Oral)

BO LIU, RACHITA CHHAPARIA, ARTHUR DOUILLARD, SATYEN KALE, ANDREI A RUSU, JIAJUN SHEN, ARTHUR SZLAM, MARC'AURELIO RANZATO

2024

DiLoCo: Distributed Low-Communication Training of Language Models

ICML Workshop

ARTHUR DOUILLARD*, QIXUAN FENG*, ANDREI A. RUSU*, RACHITA CHHAPARIA, YANI DONCHEV, ADHIGUNA KUNCORO, MARC'AURELIO RANZATO, ARTHUR

2023

SZLAM, JIAJUN SHEN

Towards Compute-Optimal Transfer Learning

ICLR Workshop

MASSIMO CACCIA, ALEXANDRE GALASHOV, ARTHUR DOUILLARD, AMAL RANNEN-TRIKI, DUSHYANT RAO, MICHELA PAGANINI, LAURENT CHARLIN,

2023

MARC'AURELIO RANZATO, RAZVAN PASCANU

CoFormer: Continual Learning in Semantic and Panoptic Segmentation

CVPR

FABIO CERMELLI, MATTHIEU CORD, ARTHUR DOUILLARD

2023

Nevis'22: A Stream of 100 Tasks Sampled from 30 Years of Computer Vision Research

ICLR, JMLR

JÖRG BORNSCHEIN, ALEXANDRE GALASHOV, ROSS HEMSLEY, AMAL RANNEN-TRIKIM YUTIAN CHEN, ARSLAN CHAUDHRY, XU OWEN HE,

2022

ARTHUR DOUILLARD, MASSIMO CACCIA, QIXUAN FENG, JIAJUN SHEN, SYLVESTRE-ALVISE REBUFFI, KITTY STACPOOLE, DIEGO DE LAS CASAS, WILL

HAWKINS, ANGELIKI LAZARIDOU, YEE WHYI TEH, ANDREI A. RUSU, RAZVAN PASCANU, MARC'AURELIO RANZATO

DyTox: Transformers for Continual Learning with DYNAMIC TOKEN eXpansion

CVPR

ARTHUR DOUILLARD, ALEXANDRE RAMÉ, GUILLAUME COUAIROU, MATTHIEU CORD

2022

Foundation Models for Continual Learning: An Empirical Study of Latent Replay

CoLLAs (Oral)

OLEKSIY OSTAPENKO, TIMOTHÉE LESORT, PAU RODRIGUEZ, MD RIFAT AREFIN, ARTHUR DOUILLARD, IRINA RISH, LAURENT CHARLIN

2022

Multi-Head Distillation for Continual Unsupervised Domain Adaptation in Semantic Segmentation

CVPR Workshop

ANTOINE SAPORTA, TUAN-HUNG VU, ARTHUR DOUILLARD, PATRICK PÉREZ, MATTHIEU CORD

2022

Tackling Catastrophic Forgetting and Background Shift in Continual Semantic Segmentation

TPAMI

ARTHUR DOUILLARD, YIFU CHEN, ARNAUD DAPOGNY, MATTHIEU CORD

2021

PLOP: Learning without Forgetting for Continual Semantic Segmentation

CVPR

ARTHUR DOUILLARD, YIFU CHEN, ARNAUD DAPOGNY, MATTHIEU CORD

2021

Continuum: Simple Management of Complex Continual Learning Scenarios

CVPR Workshop

ARTHUR DOUILLARD*, TIMOTHÉE LESORT*

2021

Insights from the Future for Continual Learning

CVPR Workshop

ARTHUR DOUILLARD, EDUARDO VALLE, CHARLES OLLION, THOMAS ROBERT, MATTHIEU CORD

2021

PODNet: Pooled Outputs Distillation for tiny-Tasks Incremental Learning

ECCV

ARTHUR DOUILLARD, MATTHIEU CORD, CHARLES OLLION, THOMAS ROBERT, EDUARDO VALLE

2020

CORE: Color Regression for Multiple Colors Fashion Garments

CVPR Workshop

ALEXANDRE RAME, ARTHUR DOUILLARD, CHARLES OLLION

2019

Teaching & Mentoring

DEEPMIND · Master Student, scholarship · HERMAN FRANCLIN TESSO TASSANG

2024

- On going mentoring.

DEEPMIND · PhD Student Intern · BO LIU

2023

- Led to the publication of "Asynchronous Local-SGD for Language Modeling".

DEEPMIND · PhD Student Intern · MASSIMO CACCIA

2022

- Led to the publication of "Towards Compute-Optimal Transfer Learning" at ICLR Workshop 2023.

EPITA · Master level · LECTURER FOR +90 STUDENTS PER YEAR

2019 - 2022

- Deep Learning for Computer Vision, from the basics, to the latest SotA in many domains
- Course with slides + google colab + anki cards used by more than 10,000 unique visitors per month [LINK]

SORBONNE UNIVERSITÉ · Master level · HEAD TEACHER ASSISTANT FOR +70 STUDENTS PER YEAR

2019 - 2022

- Course with google colab for Computer Vision [LINK]

- Helped Dr. Charles Ollion for CNN, Object Detection, and Segmentation

- C/C++ Programming, Unix, Shell, Algorithm theory, Java, SQL, Web Programming, Project Management
- Responsible of the course materials produced by 30 teacher assistants

Skills

- **Programming Languages:** Python Shell
- **Data Science:** Pytorch Tensorflow / Keras Jax/Haiku Scikit-Learn Numpy Pandas
- **Tools & OS:** Linux MacOS Git Jupyter Vim VSCode
- **Languages:** French (native) English (TOEIC 965/990) Spanish Mandarin (notions) Esperanto (notions)

Talks & Press

INSAIT, DISTRIBUTED MODULAR ARCHITECTURE	Bulgaria June 2024
BUZZROBOT, DISTRIBUTED MODULAR ARCHITECTURE [VIDEO]	International June 2024
COHEREFORAI, DISTRIBUTED TRAINING OF LANGUAGE MODELS	International February 2024
ACTUIA, CONTINUAL LEARNING IS NEEDED FOR AGI	Newspaper January 2024
COMPUTER VISION MEETUP @ SICARA, NEVIS'22: A CONTINUAL LEARNING BENCHMARK [VIDEO]	France February 2023
BROWN UNIVERSITY, CONSTRAINING & CONDITIONING FEATURES FOR LARGE-SCALE CONTINUAL LEARNING	USA October 2022
SORBONNE, PHD DEFENSE: CONTINUAL LEARNING FOR COMPUTER VISION [VIDEO]	France June 2022
SICARA, CONSTRAINING VISUAL-FEATURES FOR CONTINUAL LEARNING	France June 2022
DEEPMIND, CONSTRAINING & CONDITIONING FEATURES FOR LARGE-SCALE CONTINUAL LEARNING	UK April 2022
CONTINUALAI, CONTINUAL TRANSFORMERS [VIDEO]	Italy April 2022
VALEO.AI, CONTINUAL LEARNING FOR COMPUTER VISION	France March 2022
PARIS MACHINE LEARNING MEETUP, CONTINUAL LEARNING FOR SEMANTIC SEGMENTATION	France October 2021
EEML, CONTINUAL LEARNING FOR SEMANTIC SEGMENTATION	Hungary July 2021
COMPUTER VISION TALKS, CONTINUAL LEARNING FOR SEMANTIC SEGMENTATION AND OBJECT REHEARSAL	India June 2021
CVPR DAILY JOURNAL, FEATURING OF MY WORK IN THE DAILY PICK OF CVPR	USA June 2021
CVPR WORKSHOP, INSIGHTS FROM THE FUTURE FOR CONTINUAL LEARNING	USA June 2021
CVPR, PLOP: LEARNING WITHOUT FORGETTING FOR CONTINUAL SEMANTIC SEGMENTATION	USA June 2021
CONTINUALAI, CONTINUAL LEARNING OUTSIDE FULL SUPERVISION [VIDEO]	Italy Apr 2021
CONTINUALAI, CONTINUUM: SIMPLE MANAGEMENT OF COMPLEX CONTINUAL LEARNING SCENARIOS [VIDEO]	Italy Apr 2021
DATAIKU, CONTINUAL LEARNING FOR SEMANTIC SEGMENTATION	France Jan 2021
EXTRALITY, CONTINUAL LEARNING FOR SEMANTIC SEGMENTATION	France Nov 2020
ECCV, PODNET: SMALL-TASKS INCREMENTAL LEARNING [VIDEO]	UK Aug 2020
CONTINUALAI, PODNET: SMALL-TASKS INCREMENTAL LEARNING [VIDEO]	Italy May 2020
SORBONNE, INCREMENTAL LEARNING	France Jun 2019
DATAIKU, LOWSHOT LEARNING	France Aug 2018
NATO, NATO INNOVATION CHALLENGE (IN FRONT OF THE SUPREME COMMANDER AND A SMALL DOZEN OF GENERALS ACROSS THE WORLD)	France May 2018
DATAIKU, OBJECT DETECTION WITH DEEP LEARNING	France April 2018
AGROPARISTECH, STATE OF THE FOODTECH IN FRANCE	France Jan 2018

Academic Services

NEUROCOMPUTING · REVIEWER	2021 - Now
INTELLIGENT TRANSPORTATION SYSTEMS SOCIETY · REVIEWER	2021 - Now
IEEE TRANSACTIONS ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE (TPAMI) · REVIEWER	2021 - Now
TRANSACTIONS ON KNOWLEDGE AND DATA ENGINEERING (TKDE) · REVIEWER	2021 - Now
COMPUTER VISION AND IMAGE UNDERSTANDING (CVIU) · REVIEWER	2021 - Now
CVPR CONTINUAL LEARNING WORKSHOP · REVIEWER	2022
CVPR, CoLLAs, ESANN · REVIEWER	2023
ICCV · OUTSTANDING REVIEWER	2023
CONTINUALAI UNCONF · OUTREACH CHAIR	2023
JMLR · REVIEWER	2023
GOOGLE DEEPMIND: MODULARITY WORKSHOP · ORGANIZER & PRESENTER	2024