

# Arthur Douillard

RESEARCH SCIENTIST IN DEEP LEARNING

Paris, France

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## Education

### PhD in Computer Science

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

Paris, France

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

## Publications

### 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, CVPR Workshop

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

Under review at 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

## Experience

### DeepMind

London, UK

RESEARCH SCIENTIST *Advisor: Dr. Marc'auelio. Ranzato*

August 2022 - Now

- 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

GRADUATE STUDENT RESEARCHER *Advisor: Dr. Guillaume Palacios*

Paris, France

Aug 2017 - Jan 2018

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

## MyDrive Solutions

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

London, United Kingdom

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)

## Teaching

EPITA · *Master level* · LECTURER FOR +(0 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 [\[LINK\]](#)

EPITA · *Master level* · TEACHER ASSISTANT FOR +60 STUDENTS PER YEAR

2018

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

EPITA · *Bachelor level* · TEACHER ASSISTANT FOR +300 STUDENTS PER YEAR

2016 - 2018

- 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

- 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  
**CVPR CONTINUAL LEARNING WORKSHOP** · REVIEWER

2021 - Now  
2022

**ESANN** · REVIEWER

2022