Arthur **Douillard**

ENGINEER, SCIENTIST, AND TEACHER IN DEEP/MACHINE LEARNING

Paris, France

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Education

PhD in Computer Science	*Paris, France*
SORBONNE UNIVERSITY (LIP6) *Advisor: Pr. Matthieu Cord*	*Jul 2019 - June 2022*

- In-going 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	*Under review*
ARTHUR DOUILLARD, ALEXANDRE RAMÉ, GUILLAUME COUAIRON, MATTHIEU CORD	*2021*
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 Small-Tasks Incremental Learning	*ECCV*
ARTHUR DOUILLARD, MATTHIEU CORD, CHARLES OLLION, THOMAS ROBERT, EDUARDO VALLE	*2020*
CORE: Color Regression for Multiple Colors Fashion Garments	*arXiv*
ALEXANDRE RAME, ARTHUR DOUILLARD	*2019*

Experience

Heuritech	*Paris, France*
RESEARCH SCIENTIST *Advisor: Dr. Charles Ollion, Dr. Thomas Robert*	*July 2019 - Now*

- 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 plateform.
- 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.

ZebrIA	*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, United Kingdom*
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)

Teaching

EPITA · *Master level* · Deep Learning Lecturer for +60 students per year   2019 - Now
- Course with slides + google colab + anki cards used by more than 10,000 unique visitors per month [LINK]

Sorbonne Université · *Master level* · Deep Learning Teacher Assistant for +70 students per year   2019 - Now

EPITA · *Master level* · Deep Learning Teacher Assistant   2018
- Help Dr. Charles Ollion for CNN, Object Detection, and Segmentation

EPITA · *Bachelor level* · Computer Science Teacher Assistant   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

Personal Projects

- **Continual Learning data loaders** for easy research reproducibility [LINK]. Used by multiple research teams across the world and by the CVPR21 Continual competition organizers.
- Implementation of a dozen papers in Pytorch and Tensorflow cummulating to more than +700 ★ [LINK].
- **Blog** where I explain Deep Learning concepts [LINK] w/ 6k visitors per month
- Memory allocator on a **cluster of machines using MPI**.
- Minor contribution to **scikit-learn** fixing a bug in the RFECV algorithm [LINK].
- Efficient implementation of Damerau-Levenshtein distance with **Radix Trie** and mmap in C++.
- **Compiler front-end/back-end** for the language Tiger, coded in C++, YACC, Bison, and several flavors of ASM.

Skills

- **Programming Languages**:   Python C/C++ Shell SQL Java Scala Golang Prolog Haskell R Latex
- **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 (Very beginner)   Esperanto (notions)

Talks & Press

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 · Reviewer   *2021 - Now*
Computer Vision and Image Understanding (CVIU) · Reviewer   *2021 - Now*
ICIAP's CL4Real Workshop · Program Committee   *2022*