# Curriculum Vitae

# Maxence Faldor

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I am a first year PhD student at Imperial College London in the Adaptive and Intelligent Robotics lab. I am interested in Artificial Intelligence, Open-endedness, Robotics and Artificial Life, with a particular focus on the ability of intelligence to adapt to unforeseen situations in open-ended environments.

## Education

**PhD in Computer Science**     **Imperial College London**, London, United Kingdom     2022 – Present
- PhD studies in Artificial Intelligence, Open-endedness and Robotics
- Supervision: Antoine Cully

**MSc in Computer Science**     **ISAE-SUPAERO**, Toulouse, France     2016 – 2020
- Sector: Data Science, Domain: Robotics, degree obtained with honors *Very Good*, GPA: 4.02
- Supervision: Emmanuel Rachelson, Dennis Wilson, Master's thesis graded A+

**MSc in Operations Research**     **Paul Sabatier University**, Toulouse, France     2018 – 2020
- Advanced optimization, Specialization: Machine Learning, degree obtained with honors *Very Good*
- Supervision: Alain Haït

**BSc in Mathematics**     **Lycée Faidherbe**, Lille, France     2014 – 2016
- Advanced course in Mathematics and Physics for intensive preparation to the national competitive exams for entry into *Grandes Écoles* (CPGE MPSI/PSI$^\star$)
- National competitive exam "Mines-Ponts" final rank: 129 / 5,180

## Certificates

**Deep Learning**     **Udacity**     2020
A 4-month course by Udacity, AWS and Facebook AI     Credential ID: SX4KP5DM

**Machine Learning**     **Standford University**     2019
A 11-week course by Standford University earned on May 11, 2019     Credential ID: JMZ4EYACEYTK

## Experience

**Data Scientist**     **Amazon**, Luxembourg, Luxembourg     Dec 2020 – Aug 2022
- Improved inventory buying and placement systems driving 3% more one-day deliveries
- Built machine learning models to predict core metrics achieving 96% accuracy
- Evaluated the impact of perfect inventory placement on network speed by solving linear programming problems with more than 300,000 variables

**Operations Research intern**     **Amazon**, Paris, France     Apr 2020 – Oct 2020
- Worked in the Delivery Acceleration team to fulfill customers faster across Europe
- Integrated the air network in an Operations Research project in Java used for network design, optimizing speed under operational constraints
- Increased the air network speed by 5% by implementing optimization and automation scripts using Python and Redshift to fine-tune network configurations
- Used ETL and Redshift to automate data analysis, enabling insight on inventory placement opportunities

**Data Scientist intern**     **elseco Limited**, Dubai, United Arab Emirates     Apr 2019 – Aug 2019
- Leveraged machine learning to build models that help underwriting activities and give insights to the company
- Populated databases by web scraping data from multiple sources

**Software Developer intern**     **Airbus**, Toulouse, France     Sep 2018 – Feb 2019
- Developed tools in Python to spare hundreds of hours of manual work while collaborating with my co-workers using Git in an Agile team with regular scrum meetings
- Implemented unit testing and sanity checks for simulation software, ensuring reliability and accuracy in modeling and simulations

## Teaching

**Teaching Scholar**     **Imperial College London**, London, United Kingdom     2022 – Present

Alongside my PhD studies, I teach both undergraduate and postgraduate students, totaling 300 hours/year. My responsibilities include lecturing, conducting tutorials and workshops, developing and grading coursework, and managing modules.

- **Deep Learning** – 70010
  - Run lab sessions and answer questions
  - Manage and mark coursework
- **Mathematical Methods Tutorials** – 40016/40017
  - Lead tutorial sessions for correction of exercises
  - Mark student coursework and exams
- **Principles and Practices of Programming** – 70083
  - Run lab sessions and answer questions
  - Mark student coursework
- **Python Programming** – 70053
  - Course support leader: organise and lead a team of 10 Teaching Assistants
  - Design and improve coursework material
  - Lead tutorial sessions in lab
  - Mark student coursework and exams
  - Give lecture to a large audience on Python deep learning libraries and PyTorch

**Associate Fellow**     **Advance HE**, London, United Kingdom     2023 – Present

Follow the Supporting Learning and Teaching Pathway to prepare to apply for the Associate Fellowship, recognizing individuals who teach and support in higher education.

**Teaching Assistant**     **Lycée Saliège**, Balma, France     2015 – 2016

- Provided support in Mathematics for CPGE students, preparing the competitive exams for entry into *Grandes Écoles*
- Helped students in optimizing their exam preparation through targeted question resolution
- Guide students through step-by-step corrections of exercises and past exam
- Gave students learning and working methods to study more efficiently

**Private Tutoring**     **Lille**, France     2012 – 2020

Provided private lessons in Mathematics, Physics and Computer Science to high-school students

## Awards

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|---|---|
| **Invitation** – Invitation to extend a GECCO paper that received Best Paper Award for ACM TELO journal | 2023 |
| **Award** – GECCO conference Best Paper Award | 2023 |
| **Grant** – GECCO conference student grant ($\approx$ $200) | 2023 |
| **Award** – machine learning hackathon winner organized by Capgemini | 2020 |
| **Scholarship** – tuition fee waiver granted by the French Ministry of Defense | 2016 – 2020 |
| **Award** – fee waiver for competitive exams granted by the French Government | 2016 |

## Outreach

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|---|---|
| **Poster** at the Agent Learning in Open-Endedness (ALOE) workshop at NeurIPS | 2023 |
| **Talk** at GECCO conference in Lisbon | 2023 |
| **Talk** at UCL DARK lab during a workshop on Open-endedness | 2023 |

## Academic Activities

**Organizer** of the Imperial College Autonomous Reasoning & Learning (ICARL) seminar series     2023 – Present

- Each month, ICARL hosts a seminar series at Imperial College London, where we invite Artificial Intelligence researchers to give a presentation about their work
- I am responsible for the setup of the lecture theatre and technical equipment (microphones, video cameras) to ensure high-quality recordings for wider dissemination on our YouTube channel

**Organizer** of the Imperial College Reinforcement Learning reading group     2023 – Present

**Contributor** of QDax, a Python framework for Accelerated Quality-Diversity algorithms     2023

**Reviewer** for the Agent Learning in Open-Endedness (ALOE) workshop at NeurIPS     2023

**Reviewer** for the ALIFE conference     2023

## Skills

- **Languages**: French (native), English (fluent), Spanish (basic)
- **General computer science**:
  - Proficient with Unix-like operating systems and Shells
  - Container platforms Docker, Singularity, Apptainer
- **Programming Languages**: Advanced with Python, C/C++, Java, MATLAB, Git
- **Cloud Computing** with GCP/AWS

## Journal Publications

**Maxence Faldor**\*, Luca Grillotti\*, Borja G. León, and Antoine Cully. 2023. *Synergizing Quality-Diversity and Descriptor-Conditioned Reinforcement Learning*. Under review at ACM TELO.

Hannah Janmohamed, **Maxence Faldor**, Thomas Pierrot and Antoine Cully. 2023. *Preference-Conditioned Gradient Variations for Multi-Objective Quality-Diversity*. Under review at IEEE TEVC.

## Conference Publications

**Maxence Faldor**, Félix Chalumeau, Manon Flageat, and Antoine Cully. 2023. *MAP-Elites with Descriptor-Conditioned Gradients and Archive Distillation into a Single Policy*. In Proceedings of the Genetic and Evolutionary Computation Conference (GECCO '23). Association for Computing Machinery, New York, NY, USA, 138–146.
[Paper | Code | Best Paper Award | Kudos]

**Maxence Faldor**\*, Luca Grillotti\*, Borja G. León, and Antoine Cully. 2023. *Skill-Conditioned Optimal Policy with Successor Features Representations*. Under review at ICLR.
[Website]

## Workshop Publications & Preprints

**Maxence Faldor**\*, Luca Grillotti\*, Borja G. León, and Antoine Cully. 2023. *Skill-Conditioned Optimal Policy with Successor Features Representations*. Poster presentation at ALOE workshop NeurIPS 2023.
[Paper | Website]