Paul Templier

PhD Student, Engineer

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paul-templier

TemplierPaul

Google Scholar

CAREER PROFILE

Hi, I'm a PhD student specializing in the use of evolutionary methods for the optimization of neural networks as intelligent agents. I recently graduated as an ISAE-SUPAERO engineer, and have been honing my coding skills on multiple side projects for the last decade.

EDUCATION

MSc in Aerospace Engineering
2016-2020

ISAE-SUPAERO

Masters in general engineering, applied to aerospace problems. Specialized in Data Science (major) and Robotics (minor). Research projects:

- Deep Learning to solve NP-hard problems
- Deep Reinforcement Learning for human-machine cooperation.

MSc in Operations Research
2019-2020

ISAE-SUPAERO

Additional MSc coupled with the Data Science specialization with classes on:

- Optimization,
- Advanced combinatorial optimization
- Stochastic and evolutionary methods

CPGE PTSI / PT*
2014-2016

Lycée J-B Say, Paris

Preparation for national competitive exams leading to French "Grandes Ecoles".
Ranked (among 2556 candidates):

- 28th at "Concours Commun Mines-Pont PT"
- 33rd at "Concours Centrale-Supélec PT".

WORK EXPERIENCES

PhD in Machine Learning
2021-Present

Supervised by Emmanuel Rachelson, Dennis G. Wilson
ISAE-SUPAERO, Toulouse, France

PhD topic: Evolutionary strategies for neural policy search.
Application: game-playing, control tasks, Reinforcement Learning
Intern co-supervision: Tarek Kunze on GENE encoding extension.
Published work: *see Publications*

Visiting PhD Student
Mar-Jul 2023

Supervised by Antoine Cully
Imperial College London, UK

Visiting student at Antoine Cully's Adaptative & Intelligent Robotics Lab (AIRL) at Imperial College London to work on evolution strategies for policy search applied to robotics, and on the combination of evolutionary methods with reinforcement learning.

Research Intern
May-Nov 2020

Supervised by Dennis G. Wilson
ISAE-SUPAERO, Toulouse, France

Research internship on neuroevolution (evolution of neural networks with genetic algorithms)applied to video games.
Optimizing artificial neural networks with evolutionary algorithms

Ranked first in the GECCO 2020 competition on evolving a DOTA 2 bot.

Cybersecurity Consultant
Feb-Aug 2020

Wavestone, Paris, France

Internship subject: current and future uses of AI for cybersecurity intrusion detection & response. Developing a PoC of Machine Learning for anomaly detection in a Security Operation Center. Other missions: EBIOS risk analysis, impacts on cybersecurity of emerging technologies.

Member of the Board
2017-2020

ISAE-SUPAERO, Toulouse, France

Elected mandate as Students Representative on the ISAE-SUPAERO board.

CEO's Right Hand
Jul-Dec 2019

Pricemoov, Paris, France

Leading high-stake international projects with long-term implications in an AI-focused startup. Structuring internal processes and implementing management KPIs.

Quality-Audit analyst
2016-2018

SUPAERO Junior Conseil, Toulouse

Continuous improvement of ISAE-Supaero's Junior-Entreprise processes, developing tools in Excel / VBA. Member of the Strategic Guidance Board until 2021.

LANGUAGES

French (Native)

English (Certificate of Proficiency - C2)

Spanish (Independant - B2)

CODING

Python (Proficient, teaching experience)

Julia (Professional experience)

C / Java (Academic experience)

JS / HTML / CSS (Side projects)

Jax, pytorch, sklearn, pandas, MPI, Ray (Computing tools)

INTERESTS

Evolutionary computation

Machine Learning

Reinforcement Learning

Evolution Strategies

Open-ended evolution

Auto-ML

Robotics

HOBBIES

Cooking

Game development

Member of the Board 2015-2016
Lycée J-B Say, Paris

Elected mandate as CPGE Students Representative on the board of Lycée J-B Say.

PROJECTS

Here are some of the recent projects I worked on, either during my PhD or my Masters degree, or as personal side projects.

BERL - Benchmarking Evolutionary Reinforcement Learning: a python framework to test and evaluate Evolution Strategies for RL tasks, with MPI parallelism

GENE - A Geometric Encoding for Neural Network Evolution

NeuroEvolution.jl - A Julia implementation of NEAT-based neuroevolution algorithms (NEAT, CPPN, HyperNEAT)

Multidimensional GP for multiclass classification - Jupyter notebook implementing, presenting and explaining a research paper for Data Science specialization.

Genepy - Artificial life simulation in a 2D environment, with a custom implementation of NEAT for the brains.

Groinkbot - Multi-platform chatbot framework, based on a modular architecture and with a high-level interface.

Compute - Python tool to easily configure and run experiments on remote hosts with pre-defined configurations through SSH

Solvers - Bruteforce solvers for puzzle games like Minesweeper or Scrabble.

PUBLICATIONS

Peer reviewed:

- LUCIE: An Evaluation and Selection Method for Stochastic Problems
Erwan Lecarpentier, Paul Templier, Emmanuel Rachelson, Dennis G. Wilson (Paper) (Code)
GECCO 2022 (Genetic and Evolutionary Computation Conference)

- A Geometric Encoding for Neural Network Evolution
Paul Templier, Emmanuel Rachelson, Dennis G. Wilson (Paper) (Code)
GECCO 2021 (Genetic and Evolutionary Computation Conference)

- Evolving a Dota 2 bot: Illuminating search in CGP and NEAT
Paul Templier, Lucas Hervier, Dennis G. Wilson (Paper) (Code)
Competition at GECCO 2020

Blog articles:

- Detecting security incidents with Machine Learning (FR)
Hugo Moret, Paul Templier
RiskInsight blog (Wavestone)

- Security of instant messaging applications (FR)
Wajih Jmaiel, Paul Templier
RiskInsight blog (Wavestone)