

Louis Jalouzot

Nantes/Lyon – France

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Education

- **Master's Degree in Fundamental Computer Science (ENS Lyon, France)** September 2021 - Present
 - **Optimization:** gradient/(quasi-)Newton methods, constrained optimization, polyhedral method, simplex
 - **Quantum Computing:** search algorithms, density operators, compression, error correcting codes
 - **Parallel Computing:** PRAM, distributed algorithms, scheduling
 - **Compilation:** typing, semantics, CFG, SSA, parallelism
 - **Performance Evaluation:** simulation, statistics, queuing theory, (continuous) Markov chains
 - **English:** thematic course
- **License's Degree in Computer Science (ENS Lyon, France)** September 2020 - May 2021
 - **Algorithmics:** data structures, complexity, classical paradigms, graphs, NP-completeness, string search
 - **Computability:** (pushdown) automata, Turing machines, decidability, P and NP, λ -calculus
 - **Semantics:** denotational/operational/axiomatic semantics, typing
 - **Programmation:** Python, OCaml, C/C++, L^AT_EX, bash, makefile, ssh, git
 - **Logic:** proof theory, Gödel's (in)completeness theorems, set theory
 - **Probability:** probabilistic methods, Monte Carlo, Markov Chains
 - **Algebra:** groups, rings, fields, Galois theory
 - **Topology:** connectivity, completeness, compactness, differential calculus, Banach/Hilbert spaces
 - **English:** preparation for the CAE
- **Scientific Preparatory Class MPSI and MP* (Rennes, France)** September 2018 - July 2020
 - Two-year intensive preparation courses for the entrance exams to top French Engineering schools (Grandes Écoles)
 - **Studied subjects:** Mathematics, Physics, Computer Science, French literature, English
- **High School diploma, equivalent to A Levels (Nantes, France)** July 2018
 - Scientific option, maths specialty, with honors

Experience

- **ML internship:** meta-learning, Python, PyTorch Summer 2021, 8 weeks
 - **Topic:** Program synthesis for the ARC dataset
 - **ARC dataset:** available in [this repository](#) and presented in [this article](#) by F.Chollet
 - set of similar tasks (meta-learning), each with a few examples (solved instances) and a test instance
 - **Goal:** build an algorithm that can learn to solve a new task only with its examples
 - Performances on one task (resp. globally) should improve with experience on this task (resp. with the number of tasks)
 - Approach by program synthesis: build an algorithm that generates programs which may be a solution to a task
 - My contributions (available with my internship report in [this repository](#)):
 - Modeling of ARC tasks
 - Formalization of *prior knowledge* and programs
 - Generation of solved tasks
 - Designing and training of neural networks
- **Reinforcement Learning introduction course (Alan Turing Institute)** Summer 2021, 1 week

Projects

- **Contributions to the Toposim Library (integrated project)** September 2021 - Present
 - Toposim is a 3D simulation library in C++ based on CGAL
 - **Goals of the project:**
 - Implement collisions, mesh cutting/refining
 - Study validity domains of several integration methods
 - Create a GUI to render a video from multiple mesh files
 - C++, Python, git, Qt, Blender, bash
- **Creation of a C compiler (course)** September 2021 - January 2022
 - Compiler for a simplified version of C into RISC-V assembly code
 - Implementation of code optimization techniques
 - Python, git, ANTLR, RISC-V
- **Creation of an OCaml interpreter (course)** January 2020 - May 2021
 - For interpreting a simplified version of OCaml, coded in OCaml
 - OCaml, git, bash

Technical Skills

- **Languages:** Python (advanced), C/C++ (advanced), OCaml (advanced), bash (intermediate)
- **Applications:** VSCode, Coq, SolidWorks
- **OS:** LINUX, Windows, Android
- **Other tools:** Qt (familiar with), git (intermediate), SQL (basic notions)

Additional Information

- I will attend more ML-related courses during the second semester of my Master's Degree:
 - Machine Learning
 - Data Bases and Data Mining
- I speak French (native language) and English (I will attend the CAE in January 2022).

References

- **Aurélien Garivier (ENS Lyon, UMPA, LIP)**
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- **Nathanaël Fijalkow (CNRS in LaBRI, The Alan Turing Institute)**
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