

# Émile Trotignon

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Born July 30th, 1999

As a master's student in Computer Science at ENS Paris-Saclay, I am very interested in OCaml, programming languages and compilation.

## Formation

- 2020 – 2022 **Master's degree in Computer Science Research (MPRI)**, *École Normale Supérieure Paris-Saclay*
- 2019 – 2020 **Bachelor in Computer Science**, *École Normale Supérieure Paris-Saclay*
- 2018 – 2019 **Second year of Bachelor in Computer Science and Mathematics**, *Université Lyon 1 Claude-Bernard*
- 2017 – 2018 **First year of Bachelor in engineering**, *Jean-Perrin preparatory school*
- 2016 – 2017 **High school diploma with science focus**, *Lycée La Trinité*

## Experience

- Spring 2022 **Research internship in computer science**, *OCamlpro, team Flambda*, Paris, France  
4.5-month internship tutored by Vincent Laviro and Pierre Chambart. Generalisation of recursive tail-call optimisation modulo constructor
- Spring 2021 **Research internship in computer science**, *Inria Paris, team Cambium*, Paris, France  
Five-month internship tutored by François Portier. Improvements the code generated by Menhir, the LR(1) parser generator for OCaml : Typing with GADTs for increased safety, allowing bolder optimisations. The number of allocations was divided by 4, and the speed increased by 10%, across various grammars.
- Summer 2020 **Research internship in computational geometry**, *LIRIS laboratory*, Lyon, France  
Six weeks internship tutored by David Coeurjolly and Vincent Nivoliens. My goal during this internship was to uniformly sample the surface of a potentially imperfect mesh. During the six weeks, I spent a good portion of my time programming in C++ and I used tools such as Polyscope and LIBIGL. My internship report is available here: <https://emiletrotignon.github.io/files/rapport.pdf>
- March 2020 **Fullstack Node.js developer**, *Junior entreprise of ENS Paris-Saclay*  
During a six week mission for the junior entreprise of ENS Paris-Saclay, I contributed to the website development of Expert People, a new freelancing platform. The technologies used were Node.js and Express.js. One of my achievements was parsing LinkedIn resumes in PDF format to auto-fill the resume form. Expert People's website (in french) : <https://expertpeople.co/>
- January 2020 **ICPC SWERC 2019-2020**, *Télécom Paris*  
University programming/algorithms competition. Participation in teams of three students. Ranked 37th of 95 teams representing universities from multiple european countries.
- Summer 2019 **Intern C# developer**, *Eternix Ltd.*, Tel Aviv, Israel  
Two month internship. HLSL shaders, introduction to DirectX and OpenCV, Windows Form development. Greatly rewarding experience abroad.
- July 2018 **Front end developer**, *École Nationale Supérieure des Sciences de l'Information et des Bibliothèques*, Lyon, France  
For a month, I contributed to the graphical integration of the new website for ENSIB, the French school for library curators. You can see their website here: <http://www.enssib.fr/>

## Languages

English    Fluent  
French    Native

## Technical skills

### Compilation

I am very interested in compilation. In this domain, for a M2 course, I have written a type checker for the f-omega type system. The code is available here: <https://github.com/EmileTrotignon/f-omega>. For a M1 course, I have written a compiler for an ML-style langage to X86. The code is available here: <https://github.com/EmileTrotignon/cours-compilation-p7>. I have also programmed a compiler for a subset of the C language to X86 in 2019: <https://github.com/EmileTrotignon/mcc>

### Fundamental Computer Science

I have studied different aspect of fundamental Computer Science : Programming languages semantics, theory of parallel computing with shared memory, formal languages, calculability, logic. This enhances my understanding of computer science in general, in addition to the particular skills acquired.

## Functionnal programming

I really enjoy functionnal programming languages, as well as advanced type systems. I have been programming in OCaml since my first year of university, and I am very passionate about this language. I have some experience with Scala and Rust, and I had a lot of fun exploring advanced C++ features. I also published a package on Opam, the Ocaml package manager : [https://github.com/EmileTrotignon/embedded\\_ocaml\\_templates](https://github.com/EmileTrotignon/embedded_ocaml_templates). It includes a PPX rewriter, and a small parser written with Menhir.

## Proof assistants and verification

I have taken a course on the Coq proof assistant, and one on the Why3 verification framework. I am not fluent with neither of this tools, but I would love to become more familiar with them.

## GUIs

I have experience with a few frameworks for programming GUIs : Qt and Dear ImGui with C++, WinForm with C#, Swing with Scala, Tkinter with Python.

## Web development

Front-end : Good knowledge of HTML and CSS. One month experience during the summer of 2018.

Back-end : Professional experience developing a Node.js web app.

## Miscellaneous

Use of a Unix system with the command line : file manipulation, Git, SSH. Image editing with GIMP and Inkscape. Typesetting with LaTeX.