

# Pierre Vial

Software engineer, PhD

- I'm a software engineer, with a strong academic background, looking for a position, especially in **Machine Learning** and **program verification**.
- Expert in **functional programming** and in **formal methods**
- I took a recent turn toward Machine Learning, mainly through the **Fastai platform** and Andrew Ng's **Coursera Deep Learning specialization**, where I familiarized myself with TensorFlow and Numpy. In the years to come, I hope to dedicate most of my activities to ML.
- **ENS Paris** alumnus, *agrégation* in mathematics, **PhD** at Paris Diderot, former post-doc at **Inria Bretagne-Atlantique** and **ENS Paris-Saclay**.

## Experience

- 10/22 – 1/23 **Software verification engineer**, *Formal Land*
- As one of the 7 member of the company, I was in charge of verifying the **Tezos blockchain protocol** (written OCaml) using the **Coq proof assistant**.
  - We formally verified that internal error (= errors other than those caused by users) could not occur in the protocol.
- 2020 – 9/22 **Post-doc at Deducteam (Inria)**, *ENS Paris-Saclay*
- In a team of 4, I developed a **Coq plugin** called **Sniper**, which **automatized** some parts of proofs: actually, proof assistant, compared to automatic provers, such as SMT solvers, have a huge expressivity and can capture extremely rich specs, but they usually lack automation.
  - We implemented automated proofs using various **metaprogramming** tools.
- 2018 – 2022 **Teacher**, *Université de Nantes, IMT Atlantiques, Polytech'Saclay, IUT d'Orsay*, 212 h
- Teaching full classes and hands-on mostly in computer science and programming, and a bit in mathematics, mostly undergraduate level.
- 2018 – 2019 **Post-doc in the Gallinette Team**, *LS2N (Inria and CNRS)*, Nantes
- Within ERC grant CoqHott, working on the theoretical termination and quantitative properties of the Coq proof assistant
- 2017 **Teaching and research assistant (“A.T.E.R.”)**, *Paris Diderot*
- 2014 – 2017 **Phd student - teaching assistant**, *Paris Diderot — Paris 7*
- Giving some “hands-on” to undergraduate students. 64 hrs per year
- 2009 – 2012 **Colleur de mathématiques**
- Preparation to oral examination in mathematics for Management Schools.
- 2007 – 2014 **Maths professeur agrégé**
- Mathematic teacher in the french public education system, mostly in high school and in Académie de Versailles

## IT Skills

- Langages OCaml, Coq, JavaScript, Python, Rust
- As a teacher Java, C (incl. some system programming), compilers, MySQL
- Misc. L<sup>A</sup>T<sub>E</sub>X, emacs, shell, git, metaprogramming

## Software

- Sniper Coq plugin for automated reasoning (<https://github.com/smtcoq/sniper>)

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🌐 <https://pierrevial.github.io/> • Permis B

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## Education

- 2014 – 2017 **PhD**, *IRIF*, Paris Diderot, Advisor: Delia Kesner. Co-advisor: Damiano Mazza.  
2014 **M2 LMFI (Mathematical logic and computer science)**, *Paris Diderot*  
*Magna cum laude*  
2007 **Master Stochastic Processes**, *Paris 6*  
2005 **Agrégation de mathématiques**  
2001 – 2007 **Élève fonctionnaire stagiaire**, *ENS Ulm*, Paris  
Provisional civil-servant and student in ENS Paris  
1999 – 2001 **Classes préparatoires MPSI-MP\***, *Lycée Henri Poincaré*, Nancy  
Intensive preparation for the entrance exams of french Grandes Écoles  
1999 **High school graduation**, *Lycée E. Bichat*, Lunéville

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## Languages

- French Native  
English Fluent  
German Basic communication skills (~ B1+)  
Yiddish Medium communication skills  
Hebrew Notions

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## Personal interests

I try to be as curious as possible on my freetime! And to get as much as inputs from various domains and individuals. My interests include literature (19th and 20th century), helping reviving Yiddish culture, films (from Hollywood Golden Age to now), music (classical, minimalist, punk, rock), yoga, partner dancing (Forró, Samba de Gafieira), running, trekking, climbing (as a beginner)

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## Research and publications

My resarch has been focussed on typed functional programming languages, mainly through their archetypal model, the  $\lambda$ -calculus. A full list of my publications can be found there:

<https://dblp.org/pid/188/6177.html>

During my PhD, I worked on typing systems capturing quantitative aspects of functional programs and during my post-docs, I operated a thematic mobility towards the Coq proof assistant, notably by studying its termination (normalization) property and co-developping a plugin allowing Coq to call external solvers and thus enhancing its automated reasoning.

POPL and LiCS are A\* conferences, which are the two most important on logic applied to computer science (which in particular includes formal methods). FSCD does not have a ranking, but is the merge of two A conferences (RTA – TLCA). Two out of three of my papers accepted at LiCS were single-authored and one at FSCD.

- 2018 Invited speaker of HOR (Higher-order rewriting)  
2021 Member of the POPL Artifact Evaluation Committee  
The role of this committee is to evaluate the software developments submitted to POPL

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