

Clément Pit-Claudel

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MIT PhD candidate specializing in programming languages, extensible compilers, and verification.

Education

- 2014–now **Massachusetts Institute of Technology**, Cambridge, USA
MS 2016, PhD ongoing. PhD thesis: *Modular proof-producing extraction for end-to-end verification*. Advised by Adam Chlipala.
- 2011–14 **École Polytechnique**, Palaiseau, France (MSE specializing in computer science; undergraduate in mathematics and physics)
Diplôme d'ingénieur 2014, MSE 2016. GPA: 3.95.

Selected publications

- 2021 **ASPLOS** **Effective Simulation & Debugging for High-Level Hardware Languages Using Software Compilers**
Clément Pit-Claudel, Thomas Bourgeat, Stella Lau, Arvind, Adam Chlipala.
- 2020 **SLE** **Untangling Mechanized Proofs**
Clément Pit-Claudel.
- IJCAR** **Extensible Extraction of Efficient Imperative Programs with Foreign Functions, Manually Managed Memory, and Proofs**
Clément Pit-Claudel, Peng Wang, Benjamin Delaware, Jason Gross, Adam Chlipala.
- PLDI** **The Essence of Bluespec: A Core Language for Rule-Based Hardware Design**
Thomas Bourgeat, Clément Pit-Claudel, Adam Chlipala, Arvind.
- 2019 **ICFP** **Narcissus: Correct-by-Construction Derivation of Decoders and Encoders from Binary Formats**
Benjamin Delaware, Sorawit Suriyakarn, Clément Pit-Claudel, Qianchuan Ye, Adam Chlipala.
- 2017 **SNAPL** **The End of History? Using a Proof Assistant to Replace Language Design with Library Design**
Adam Chlipala, Benjamin Delaware, Samuel Duchovni, Jason Gross, Clément Pit-Claudel, Sorawit Suriyakarn, Peng Wang, Katherine Ye.
- 2016 **CAV** **Trigger Selection Strategies to Stabilize Program Verifiers**
K. Rustan M. Leino and Clément Pit-Claudel.
- CoqPL** **Company-Coq: Taking Proof General one step closer to a real IDE**
Clément Pit-Claudel, Pierre Courtieu. Workshop paper.
- 2015 **POPL** **Fiat: Deductive Synthesis of Abstract Data Types in a Proof Assistant**
Benjamin Delaware, Clément Pit-Claudel, Jason Gross, Adam Chlipala.

Teaching experience

- 2016 **Designed labs, taught recitations, prepared debriefings** for MIT's *Fundamentals of Programming* class (6.009); received an average rating of 6.8/7, 55 perfect reviews, and a departmental award for outstanding teaching. **MIT** – 4 month teaching assistantship
- 2011–12 **Designed AP-level STEM classes** and taught over 60 motivated teenagers from low-income neighborhoods. Over 95% of the students completed the program successfully. **Association Tremplin** – 7 months civil service in Seine-Saint-Denis, France

Research & industry experience

- 2017 Implemented **reflective pattern-matching tactics** for F^{*}; contributed to research on **effect erasure**; rewrote F^{*}'s **IDE protocol and state machine**. **INRIA (Prosecco team, supervised by Cătălin Hrițcu)** – 3 months internship in Paris, France
- 2015 **Improved the predictability of the Dafny program verifier**, generating custom triggers to prevent spurious quantifier instantiations and matching loops. **Microsoft Research (RISE group, supervised by K. Rustan M. Leino)** – 3 months internship in Redmond, WA

Entrepreneurship

- 2013–17 **Launched YiXué Chinese Dictionary**, a paid English-Chinese dictionary for Windows Phone. YiXué sold over 1000 copies, achieved a 4.7★ rating with over 200 reviews, and was featured three times on Microsoft's app store.
- 2009–now **Launched and maintained Create Synchronicity**, an open source backup & synchronization app (**450k downloads, 2k daily users**, translated to 30 languages). Featured in *PC Magazine's Best free software of 2011* and *Computer Bild's Open Source DVD*.

Community service, mentorship, and outreach

- Co-chairing CAV2021's artifact evaluation committee.**
- Served in the AECs of **POPL'16 and '18** and reviewed for **NASA's Formal Methods Symposium** and the **Journal of Functional Programming**.
- Co-organized the 26th French national session of the European Youth Parliament (2009)**, raising 20k€ and hosting 150 participants for 4 days.

Extra-curricular activities

- Blogged about mathematics, programming, and formal verification**; got featured in the *Code Project's Insider* daily newsletter.
- Launched or contributed to many free software projects** since 2012, including **documentation tools** for Coq and F^{*} and **Emacs packages** for bibliography management, syntax checking, and various research languages (wrote *biblio.el*, *ESH*, *company-coq*, *F^{*}-mode*, and *boogie-friends*; co-maintained *Flycheck* and *Proof-General*).

Selected awards

- Distinguished artifact**, *Untangling Mechanized Proofs*, ACM SIGPLAN Intl. Conf. on Software Language Engineering (2020).
- William A. Martin Memorial Thesis Award for Outstanding Thesis in CS**, *Compilation using Correct-by-Construction Synthesis*, MIT (2016).
- Frederick C. Hennie III Teaching Award in Recognition of Outstanding Contributions to Departmental Teaching**, 6.009 *Fundamentals of Programming*, MIT (2016).

Skills

- Software design & development:** Wrote professional software in C#, Emacs Lisp, Python, TypeScript, JavaScript, VB.Net, and C++. Other languages include OCaml, Coq, HTML+CSS, C, Java, Dafny, F^{*}, Racket, PHP.
- Languages:** **French** (mother tongue, French citizen), **English** (fluent), **Spanish**, **Chinese**, **Japanese** (basic).