

## Curriculum Vitae of **Robert Pollack**

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### Research Positions

**Research Associate** (02/11 – 09/15) Harvard University. Working in group of Prof. Greg Morrisett.

**Senior Research Fellow** (02/10 – 01/11) University of Edinburgh, U.K. Co-proposer and Edinburgh site leader of EU funded project *CerCo*.

**Research Associate** (10/09 – 02/10) University of Edinburgh, U.K. Working on EPSRC funded Platform Grant EPE/005713/1.

**Research Associate** (12/05 – 10/09) University of Edinburgh, U.K. Working on EU funded project *Mobius*, IST-15905.

**Research Associate** (06/05 – 11/05) Royal Holloway, University of London, U.K. Working on EPSRC funded project GR/R84092.

**Senior Research Fellow** (12/02 – 10/04) University of Edinburgh, U.K. Working with John Longley on EPSRC funded project GR/N64571.

**Senior Research Fellow** (8/99 – 10/02) University of Durham, U.K. Working with Prof. Zhaohui Luo on EPSRC funded project GR/M75518.

**Research Contract** (2/99 – 6/99) with the Computing Science Institute, University of Nijmegen; working at University of Edinburgh.

**Research Fellow** (2/98 – 1/99) at Computing Science Dept., University of Glasgow, U.K.

**Research Assistant Professor** (2/97 – 1/98) at BRICS, Computer Science Dept., University of Aarhus, Denmark.

**Research Contract** (4/96 – 1/97) with the Computing Science Institute, University of Nijmegen.

**Post-Doctoral Fellow** (5/94 – 3/96) in the Programming Methodology Group, Dept. of Computing Science, Chalmers University of Technology, Göteborg, Sweden.

**Research Associate** (10/87 – 4/94) at the Laboratory for Foundations of Computer Science, University of Edinburgh, U.K.

### Education

**Ph.D., Computer Science** (1994), University of Edinburgh, Scotland. Thesis supervisor: Rod Burstall; thesis title: *The Theory of LEGO: A Proof Checker for the Extended Calculus of Constructions*.

**M.S., Mathematics** (1977), Northeastern University, Boston, USA.

**B.S., Mathematics** (1972), Massachusetts Institute of Technology, USA.

**Other studies:** Univ. of Texas at Austin (1986–87); studied with Boyer and Moore. Part-time studies (while working) at Wang Institute of Software Engineering, Massachusetts (1983–85). Ph.D. student in mathematics (1972–74) at Univ. of Wisconsin, Madison.

**Research Interests** Theory and practice of mechanical proof checking; programming and reasoning with dependent types; specification and correctness of programs and algorithms; constructive type

theory; formal mathematics; logical frameworks and representation and reasoning about binding; dependently typed records and modules for dependently typed functional programming; representation of mathematics in type theory.

**Teaching Experience** Postgraduate courses in logic and type theory (Edinburgh Univ., 2004, 2002, 1993, 1992, 1991). M.Sc. course on logic and formal systems (Aarhus Univ., 1997). Postgraduate course on my own research (Chalmers Univ. of Technology, 1995). Undergraduate courses in elementary algebra, computer programming, and differential equations (Northeastern Univ, 1985–1987).

**Industrial Experience** Programming and software engineering during much of 1969–86. Specialized in real-time systems such as industrial process control, communications and air traffic control. Consultant to the Transportation Systems Center of the U.S. Dep't. of Transportation. Chief software engineer of a startup company building process control computers. Vice-president and co-founder of a software consulting company.

**Personal** Joint U.S. and U.K. nationality.

**Refereed publications** Most available from <http://homepages.inf.ed.ac.uk/rpollack/>.

- A Verified Information-Flow Architecture. (With Azevedo de Amorim, Collins, DeHon, Demange, Hrițcu, Pierce and Tolmach.) *Principles of Programming Languages, POPL 2014*.
- Viewing  $\lambda$ -terms Through Maps. (With Masahiko Sato, Helmut Schwichtenberg and Takafumi Sakurai.) *Indagationes Mathematicae* 24(4), Nov. 2013.
- A Theory of Information-Flow Labels. (With Benoît Montagu and Benjamin C. Pierce.) *IEEE Computer Security Foundations Symposium, CSF 2013*.
- A Canonical Locally Named Representation of Binding. (With Masahiko Sato and Wilmer Ricciotti.) *J. Automated Reasoning* (2012) 49:185–207 (DOI 10.1007/s10817-011-9229-y).
- External and Internal Syntax of the Lambda-calculus. (With Masahiko Sato.) *J. Symbolic Computation* 45 (2010) pp. 598-616
- Engineering Formal Metatheory. (With Brian Aydemir, Arthur Charguéraud, Benjamin C. Pierce and Stephanie Weirich.) *Principles of Programming Languages, POPL 2008*.
- A logical framework with dependently typed records. (With Thierry Coquand and Makoto Takeyama.) *Fundamenta Informaticae*, 65(1–2), 2005.
- Reasoning about CBV functional programs in Isabelle/HOL. (With John Longley.) *Theorem Proving in Higher Order Logics, TPHOLs 2004*. Springer-Verlag LNCS 3223.
- A logical framework with dependently typed records. (With Thierry Coquand and Makoto Takeyama.) *Typed Lambda Calculus and Applications, TLCA 2003*. Springer-Verlag LNCS 2701.
- Dependently typed records in type theory. *Formal Aspects of Computing*, 13:386-402, 2002.
- A constructive algebraic hierarchy in Coq. (With Herman Geuvers, Freek Wiedijk and Jan Zwanenburg.) *J. Symbolic Computation*., 34:271–286, 2002.
- Dependently typed records for representing mathematical structure. *Theorem Proving in Higher Order Logics, TPHOLs 2000*. Springer-Verlag LNCS 1869.

- Some lambda calculus and type theory formalized. (With James McKinna.) *J. Automated Reasoning*, 23(3–4), Nov. 1999.
- How to believe a machine-checked proof. *Twenty Five Years of Constructive Type Theory*, Oxford University Press. Aug. 1998.
- A verified typechecker. *International Conference on Typed Lambda Calculi and Applications, TLCA'95, Edinburgh*. Springer-Verlag LNCS 902.
- On extensibility of proof checkers. *Types for Proofs and Programs, TYPES'94, Båstad: Selected papers*. Springer-Verlag LNCS 996.
- Checking algorithms for Pure Type Systems. (With L. van Benthem Jutting and James McKinna.) *Types for Proofs and Programs, TYPES'93, Nijmegen: Selected papers*. Springer-Verlag LNCS 806.
- Closure under alpha-conversion. *Types for Proofs and Programs, TYPES'93, Nijmegen: Selected papers*. Springer-Verlag LNCS 806.
- Pure Type Systems formalized. (With James McKinna.) *International Conference on Typed Lambda Calculi and Applications, TLCA'93, Utrecht*. Springer-Verlag LNCS 664.
- Using typed lambda calculus to implement formal systems on a machine. (With Arnon Avron, Furio Honsell and Ian Mason.) *J. Automated Reasoning* 9:309–354, 1992.
- Type checking with universes. (With Robert Harper.) *Theoretical Computer Science* 89:107–136, 1991.
- Type checking, universe polymorphism, and typical ambiguity in the Calculus of Constructions. (With Robert Harper.) In *TAPSOFT'89, Barcelona*. Springer-Verlag LNCS 352.

**Some other publications and talks** Some available from <http://homepages.inf.ed.ac.uk/rpollack/>.

- $\beta$  reduction without rule  $\xi$ . (With Masahiko Sato.) In *Liber Amicorum Henk Barendregt*, Radboud Universiteit, 2015.
- Preliminary Design of the SAFE Platform (With DeHon *et al.*) *Workshop on Programming Languages and Operating Systems, PLOS 2011*. ACM Digital Library.
- A Canonical Locally Named Representation of Binding. (With Masahiko Sato.) *Workshop on Mechanized Metatheory (WMM 2009), colocated with ICFP 2009*.
- External and Internal Syntax of the Lambda-calculus. (With Masahiko Sato.) *Workshop on Theory and Applications of Abstraction, Substitution and Naming (TAASN 2009)*, colocated with ETAPS 2009.
- Strong Induction Principles in the Locally Nameless Representation of Binders. With Christian Urban. *2nd ACM SIGPLAN Workshop on Mechanizing Metatheory*, colocated with ICFP 2007.
- Invited talk *Local Representations of Binding* at Workshop on Logical Frameworks and Meta-Languages: Theory and Practice (LFMTP) 2007.
- *Types for Proofs and Programs, International Workshop, TYPES 2000*. (Editor, with Callaghan, Luo and McKinna.) Springer LNCS 2277.
- The algebraic hierarchy of the FTA project. (With Herman Geuvers, Freek Wiedijk and Jan Zwanenburg.) In *Proceedings of Calculemus 2001*.

- Dependently typed records for representing mathematical Structure. In *Workshop on Subtyping and Dependent Types in Programming, DTP'2000*. INRIA Technical Report.
- *Informal Proceedings of the Joint CLICS–TYPES Workshop on Categories and Type Theory*. (Edited with Peter Dybjer.) Report 85, Programming Methodology Group, Göteborgs University and Chalmers University of Technology, Göteborg, Sweden. May 1995.
- Polishing up the Tait–Martin-Löf proof of the Church–Rosser theorem. In *Proceedings of De Wintermöte '95*, Department of Computing Science, Chalmers University of Technology, Göteborg, Sweden, Jan. 1995.
- Are tactics feasible? In *CADE-12 Workshop on Correctness and Metatheoretic Extensibility of Automated Reasoning Systems*, Nancy, 1994.
- *The Theory of LEGO: A Proof Checker for the Extended Calculus of Constructions*. Ph.D. thesis, University of Edinburgh, 1994.

### Other professional activities

- Program committee of *Coq for Programming Languages (CoqPL 2016)*, affiliated with POPL 2016.
- Program committee of *Interactive Theorem Proving (ITP 2015)*.
- Co-chair of *Logical Frameworks and Meta-languages: Theory and Practice (LFMTP 2013)*, affiliated with ICFP 2013.
- Program committee of *Coq-5*, affiliated with ICFP 2013.
- Program committees of *Interactive Theorem Proving (ITP 2012)* and *Certified Programs and Proofs (CPP 2012)*.
- Program committees of *Workshop on Proof Search in Type Theories (PSTT'09)* and *Modules and Libraries for Proof Assistants (MLPA'09)* (both co-located with CADE'09, Montreal).
- Program committee of *Theorem proving in Higher Order Logics (TPHOLs 2009, Munich)*.
- Steering committee of EU Coordination Action 510996 (TYPES). Active in proposal and management of 4 previous European TYPES Actions.
- Program committee of *Workshop on Logical Frameworks and Meta-Languages: Theory and Practice (LFMTP'08)*.
- Program committee of *Workshop on Mechanizing Metatheory 2007*, co-located with ICFP.
- Organizer of EU-funded TYPES *Workshop on Math Wikis*, Oct. 2007.
- Program committee of *Types in Language Design and Implementation (TLDI) 2007*.
- Program committee of *Programming Languages meets Program Verification (PLPV) 2006*.
- Program committee of *Mathematically Structured Functional Programming (MSFP) 2006*.
- Co-organizer of by-invitation workshop *Binding Challenges* at JAIST (Kanazawa, Japan), Apr. 2005.
- Steering committee of *MEchanized Reasoning about Languages with variable biNding (MERLIN)*.