# REUBEN N. S. ROWE

Lecturer, Department of Computing, Royal Holloway University of London, Egham, TW20 0EX
Tel: +44 (0)1784 276827 Email: reuben.rowe@rhul.ac.uk Nationality: British


## RESEARCH INTERESTS

- Program logics and (automatic) verification
- Separation Logic, Transitive Closure Logic
- Infinitary and cyclic proof theory
- Refactoring and Program Synthesis
- Semantics and type systems for programming languages (intersection types, guarded recursive types)
- New programming paradigms, foundational models of computation

## EDUCATION

**PhD (Computer Science)** **Imperial College London** **2008 - 2012**
Thesis: Semantic Types for Class-based Objects Supervisor: Dr Steffen Van Bakel
Examiners: Prof. Mariangiola Dezani, Prof. Luca Cardelli

**MSc in Advanced Computing** **Imperial College London** **2007 - 2008**
Distinguished Dissertation: Intersection Types for Class-based Object-Oriented Programming

**BA (Hons) Computer Science** **University of Cambridge** (Fitzwilliam College) **2001 - 2004**

## EMPLOYMENT (ACADEMIC)

**Lecturer** **Royal Holloway, University of London** **Aug 2019 –**

**Research Associate** **University of Kent, School of Computing** **Dec 2016 – Aug 2019**
Employed on EPSRC Grant EP/N028759/1 “Trustworthy Refactoring”

**Research Associate** **UCL, Department of Computer Science** **May 2014 – Nov 2016**
Employed on EPSRC Grant EP/K040049/1 “Boosting Automated Verification Using Cyclic Proof”

**Teaching Fellow** **Imperial College London, Department of Computing** **Aug 2012 – May 2014**
Responsible primarily for teaching duties and course organisation of MSc in Computing Science

## PUBLICATIONS

- Liron Cohen and Reuben N. S. Rowe. Integrating Induction and Coinduction via Closure Operators and Proof Cycles. IJCAR 2020 (to appear).
- Liron Cohen, Reuben N. S. Rowe, and Yoni Zohar. Automated Reasoning in Herbrand Structures. Journal of Logic and Computation 29(5): 693-721 (2019)
- Simon Docherty, Reuben N. S. Rowe. A Non-wellfounded, Labelled Proof System for Propositional Dynamic Logic. TABLEAUX 2019: 335-352
- Reuben N. S. Rowe, Hugo Férée, Simon J. Thompson, Scott Owens. Characterising Renaming Within OCaml's Module System: Theory and Implementation. PLDI 2019: 950-965
- Reuben N. S. Rowe, Hugo Férée, Simon J. Thompson, Scott Owens. Rotor: A Tool for Renaming Values in OCaml's Module System. IWOR@ICSE 2019: 27-30
- Liron Cohen, Reuben N. S. Rowe: Uniform Inductive Reasoning in Transitive Closure Logic via Infinite Descent. CSL 2018: 17:1-17:16
- Steven Cheung, Victor Darvariu, Dan R. Ghica, Koko Muroya, Reuben N. S. Rowe: A Functional Perspective on Machine Learning via Programmable Induction and Abduction. FLOPS 2018: 84-98
- Reuben N. S. Rowe, James Brotherston: Realizability in Cyclic Proof: Extracting Ordering Information for Infinite Descent. TABLEAUX 2017: 295-310
- Reuben N. S. Rowe, James Brotherston: Automatic Cyclic Termination Proofs for Recursive Procedures in Separation Logic. CPP 2017: 53-65

- James Brotherston, Nikos Gorogiannis, Max I. Kanovich, Reuben Rowe: Model Checking for Symbolic-Heap Separation Logic with Inductive Predicates. In POPL 2016 , pages 84-96
- Reuben N. S. Rowe: Encoding the Factorisation Calculus. In EXPRESS/SOS 2015, EPTCS 190, 2015, pages 76-90
- Reuben N. S. Rowe, Steffen van Bakel: Semantic Types and Approximation for Featherweight Java. Theoretical Computer Science, Volume 517, pages 34-74 (2014)
- Steffen van Bakel, Reuben N. S. Rowe: Functional Type Assignment for Featherweight Java - To Rinus Plasmeijer, in Honour of His 61st Birthday. The Beauty of Functional Code 2013, pages 27-46
- Reuben N. S. Rowe. Safe, Flexible Recursive Types for Featherweight Java. In Proceedings of ICCSW'11, pages 80-86, Imperial College London Technical Report DTR11-9
- Reuben N. S. Rowe and Steffen van Bakel. Approximation Semantics and Expressive Predicate Assignment for Object-Oriented Programming (Extended Abstract). In TLCA 2011, pages 229- 244.
- Steffen van Bakel and Reuben N. S. Rowe. Semantic Predicate Types for Class-based Object Oriented Programming. In FTfJP'09, 2009.

## PRESENTED ABSTRACTS

- Reuben Rowe and Liron Cohen. Transitive Closure Logic: Infinitary and Cyclic Proof Systems. Presented at Programming And Reasoning on Infinite Structures (PARIS), a workshop affiliated with FSCD@FLOC 2018, Oxford, UK, July 7th-8th, 2018
- Reuben N. S. Rowe and Simon Thompson. ROTOR: First Steps Towards a Refactoring Tool for OCaml. Presented at The OCaml Users and Developers Workshop, Oxford, UK, September 8th, 2017
- Reuben Rowe and James Brotherston. Automatic Cyclic Termination Proofs for Recursive Procedures in Separation Logic. Presented at The Seventh Workshop on Tools for Automatic Program Analysis (TAPAS 2016), Edinburgh, UK, September 7th, 2016

## PAPERS UNDER SUBMISSION

- Liron Cohen and Reuben N. S. Rowe. Non-well-founded Proof Theory of Transitive Closure Logic. Submitted to ACM Transactions on Computational Logic (Oct 2018)

## TALKS & SEMINAR PRESENTATIONS

- February 2020, **UCL PPLV Cyclic Proof Reading Group**,
  (A Non-wellfounded, Labelled Proof System for Propositional Dynamic Logic)
- December 2019, **TU Delft Programming Languages Seminar**,
  (Characterising Renaming Within OCaml's Module System)
- December 2018, **University of Kent, PLAS Research Group Seminar**
  (Characterising Renaming Within OCaml's Module System)
- November 2018, **Cornell University, Programming Languages Seminar**
  (Characterising Renaming Within OCaml's Module System)
- October 2018, **Birmingham University, Theoretical Computer Science Seminar**
  (Towards a Formal Theory of Renaming in OCaml)
- September 2018, **10th South of England Regional Programming Language Seminar (Birkbeck)**
  (Uniform Inductive Reasoning in Transitive Closure Logic via Infinite Descent)
- July 2018, **Queen Mary University of London, Joint Theory Seminar**
  (Uniform Inductive Reasoning in Transitive Closure Logic via Infinite Descent)
- July 2018, **PARIS Workshop @ FloC** (Demo of the Cyclist automatic verification tool)
- October 2017, **University of Kent, PLAS Research Group Seminar**
  (Realizability in Cyclic Proof: Extracting Ordering Information for Infinite Descent)
- October 2017, **University of Birmingham, Theoretical Computer Science Seminar**
  (Realizability in Cyclic Proof: Extracting Ordering Information for Infinite Descent)

- May 2016, **University of Cambridge, Programming Research Group Seminar**
  (Program Verification Using Cyclic Proof)
- April 2015, **UCL, Resource Reasoning Project Meeting**
  (Verifying Heap-manipulating Recursive Procedures Using Cyclic Proof)
- March 2015, **Chalmers University, Second Workshop on Automated Inductive Theorem-proving**
  (short presentation on Program Verification using Cyclic Proof)

## PROFESSIONAL QUALIFICATIONS

- PG Certificate (University Learning and Teaching) Imperial College London 2014

## TEACHING EXPERIENCE

- Module Support, 1st year UG Programming Laboratory, 2019
- Lecturer, Object-Oriented Programming II (1st year UG), 2020
- Lecturer, Object-Oriented Design and Programming (half module), 2011, 2012, 2013
- Lecturer, Introduction to Java (half module), 2012, 2013, 2014
- Lecturer, Software Engineering Practice (half module), 2014
- Tutorial Supervision, Mathematical Structures & Machine Fundamentals (1st year UG), 2019-2020
- Tutorial Supervision, 1st year UG Programming, 2012-2014
- Project Supervision, MEng and MSc individual projects, 2013-2014, 2019-2020
- Project Supervision, MSc and Undergraduate group projects, 2012-2014
- Module Leader, Programming Laboratory (Conversion MSc), 2012-2013
- Coordinator, MSc group and individual projects, 2012-2014
- Personal Tutor, UG/PGT, 2012-2014, 2019-Present
- Tutorial/Lab support (2008-2016):
  - (UCL) Theory I, Theory II, Logic and Database Theory, Object-Oriented Programming
  - (Imperial College) Reasoning About Programs, Models of Computation, Advanced Issues in Object-Oriented Programming

## PROFESSIONAL ADMINISTRATION & ACTIVITIES

- Co-ordinator for Year in Industry Programmes (RHUL), 2020-Present
- Member of Departmental Academic Misconduct Panel (RHUL), 2019-Present
- Organisation of PPLV seminar series (UCL), 2015-2016
- Full responsibility for MSc admissions process (Imperial), 2012-2014
- Member of Imperial College Dept. of Computing Academic Committee (Teaching), 2012-2014
- Member of the Organising Committee for ICCSW 2011 (Imperial College Computing Students' Workshop)

## PROFESSIONAL SERVICE

- Organiser, Special Session on Proof Theory, ASL North American Annual Meeting 2020
- Reviewer for the following conferences and journals:
  - APLAS (Asian Symposium on Programming Languages and Systems)
  - CAV (Intl Conference on Computer-Aided Verification)
  - CL&C (Intl Workshop on Classical Logic and Computation)
  - CMCS (Intl Workshop on Coalgebraic Methods in Computer Science)
  - CPP (Intl Conference on Certified Programs and Proofs)
  - FLOPS (Intl Symposium on Functional and Logic Programming)
  - FoSSaCS (Intl Conference on Foundations of Software Science and Computation Structures)
  - I&C (Information and Computation)
  - ICALP (Intl Colloquium on Automata, Languages, and Programming)
  - IJCAR (Intl Joint Conference on Automated Reasoning)
  - JAR (Journal of Automated Reasoning)
  - JLC (Journal of Logic and Computation)

- LICS (Symposium on Logic in Computer Science)
- LMCS (Logical Methods in Computer Science)
- LSFA (Workshop on Logical and Semantic Frameworks with Applications)
- OOPSLA (Intl Conf. on Object-oriented Programming, Systems, Languages, and Applications)
- POPL (Symposium on Principles of Programming Languages)
- TACAS (Intl Conference on Tools and Algorithms for the Construction and Analysis of Systems)
- TLCA (Intl Conference on Typed Lambda Calculi and Applications)
- TFP (Symposium on Trends in Functional Programming)

## AWARDS

- EPSRC Doctoral Training Award (DTA)

## EMPLOYMENT (NON-ACADEMIC)

**Applications Developer** **Hyperspheric Solutions Ltd, Cambridge** **2005 - 2007**
Web 2.0 resource management and social networking systems, C# .NET

**Applications Developer** **TMR Digitial, London** **2004 - 2005**
Cold Fusion web development, programming for a bespoke children's game console