

# Curriculum Vitae

## Peter Michael Sewell

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### Contact

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### Professional History

(At the University of Cambridge Computer Laboratory unless otherwise noted.)

2023 – Fellow of the Royal Society

2018 – 2023 ERC Advanced Grant fellowship

2012 – Professor of Computer Science

2010 – 2014 EPSRC Leadership Fellow

2008 – 2012 Reader in Computer Science

2005 – 2008 University Senior Lecturer

2004 – 2005 University Lecturer

1999 – 2007 Royal Society University Research Fellow

1995 – 1999 Research Associate. Supported by the EPSRC grants *Action Structures and the Pi Calculus* and *Calculi for Interactive Systems: Theory and Experiment*, with Robin Milner as PI. Co-author of the latter grant.

1994 – 1995 Research Associate, half time. Department of Computer Science, University of Edinburgh. Supported by the ESPRIT grant *Concurrency and Functions: Evaluation and Reduction*, with Robin Milner as PI.

1998 – 2008 Director of Studies in Computer Science for Wolfson College

1998 – Fellow of Wolfson College, Cambridge.

1989 (3 mo.) Software design and coding, Pelican Systems

1986 (7 mo.) Assistant Scientific Officer, UKAEA Culham laboratory

1985 (5 mo.) Validation Assistant, ICL Bracknell

### Education/Qualifications

1990 – 1995 Ph.D. *The Algebra of Finite State Processes*, Department of Computer Science, University of Edinburgh. Supervised by Professor Robin Milner.

1989 – 1990 M.Sc. in Computation, Oxford University.

1986 – 1989 B.A. Hons. (1st), University of Cambridge. Part 2: Electrical and Information Sciences. Part 1: Natural Sciences (Physics, Mathematics, Biology of Cells, Materials)

## PhD Students

**Current:** Rini Banerjee (jointly supervised with Neel Krishnaswami), Thibaut Pérami, Dhruv Makwana (jointly supervised with Neel Krishnaswami), Angus Hammond, Ben Simmer, Mark Wassell (jointly supervised with Neel Krishnaswami), David Kaloper-Mersinjak (jointly supervised with Anil Madhavapeddy), Shaked Flur.

### Completed:

Kayvan Memarian, *The Cerberus C semantics*, 2023

Kyndylan Nienhuis, *Verified security properties for the capability-enhanced CHERI-MIPS architecture*, 2021

Conrad Watt, *Mechanising and Evolving the Formal Semantics of WebAssembly: the Web's new Low-level Language*, 2021

Christopher Pulte, *The Semantics of Multicopy Atomic ARMv8 and RISC-V*, 2018

Jean Pichon-Pharabod, *A no-thin-air memory model for programming languages*, 2018

Mark Batty, *The C11 and C++11 Concurrency Model*, 2014 (winner of the 2015 SIGPLAN John C. Reynolds Doctoral Dissertation award and the 2015 CPHC/BCS Distinguished Dissertation Competition)

Rok Strniša, *Formalising, improving, and reusing the Java Module System*, 2010 (jointly supervised with Matthew Parkinson)

Gareth Stoye, *A Theory of Dynamic Software Updates*, 2006 (jointly supervised with Gavin Bierman)

Moritz Becker, *Cassandra: flexible trust management and its application to electronic health records*, 2005

Andrei Serjantov, *On the anonymity of anonymity systems*, 2004

Asis Unyapoth, *Nomadic  $\pi$ -calculus: Expressing and verifying communication infrastructure for mobile computation*, 2001

Paweł Wojciechowski, *Nomadic Pict: language and infrastructure design for mobile computation*, 2000

## Research Staff

Kayvan Memarian (2023–), Vadim Zaliva (2021–), Thomas Sewell (2020–), Thibaut Pérami (2020), Jean Pichon-Pharabod (2018–2021), Christopher Pulte (2018–), Thomas Bauereiss (2017–), Alasdair Armstrong (2017–), Jon French (2016–2019), Robert Norton-Wright (2015–2020), Victor Gomes (2016–2019), Hannes Mehnert (2015–2017), Anthony Fox (2014–2017), Ali Sezgin (2013–2016), Stephen Kell (2013–2018), Ohad Kammar (Jul. 2013–Feb. 2014), Thomas Tuerk (2013), Dominic Mulligan (2012–2017), Kathryn Gray (2012–2017), Gabriel Kerneis (2012–2014), Peter Boehm (2011), Mike Dodds (2011–2012), Jaroslav Ševčík (2009–2011), Viktor Vafeiadis (2009–2010), Rok Strniša (Oct.–Nov. 2008), Susmit Sarkar (2007–2010), Gilles Peskine (2007–2008), Scott Owens (2006–2012), Tom Ridge (2005–2008), Mark Shinwell (2005–2006), Adam Biltcliffe (2005–2006), Gareth Stoye (Oct. 2004–Feb. 2005), Matthew Parkinson (Oct. 2004–Feb. 2005), Matthew Fairbairn (2003–04), Mair Allen-Williams (2003–04), Michael Norrish (Oct–Nov 2002), Steven Bishop (2002–04), Keith Wansbrough (2000–03), Paweł Wojciechowski (2000–01),

## Grants

2024 – 2029 SAFER. *Secure Foundations: Verified Systems Software Above Full-Scale Integrated Semantics*. ERC Advanced Grant successful proposal under ERC-2023-ADG call; transfer to UKRI Horizon Europe funding guarantee in progress. £2.1m. PI.

2023 *Bowsprit*, Intel donation, \$135 000. PI, with Neel Krishnaswami.

- 2019 – 2024 Lead academic author (with Watson, Moore, and Arm) of what became the UKRI ISCF *Digital Security by Design* Challenge, a £ 70m government + £ 114m industry programme to “radically update the foundation of the UK’s insecure digital computing infrastructure”, including £ 36m for Arm, Linaro, U. Cambridge, and U. Edinburgh to build an industrial-scale CHERI-ARM prototype, and funding for associated EPSRC, ESRC, and Innovate UK calls [\[project page\]](#).
- 2019 – 2024 *Digital Security by Design Technology Platform Prototype*, Innovate UK, £ 2.7m. PI, joint with Robert Watson and Simon Moore.
- 2019 Google DeepMind donation, £ 250 000. Joint PI with Robert Watson.
- 2019 – 2023 *ARM System Semantics*, EPSRC/ARM Industrial CASE PhD studentship, ARM funding £ 35 000 + £ 84 900 EPSRC student maintenance and fees. PI.
- 2018 – 2023 *ELVER. Engineering with Logic and Verification: Mathematically Rigorous Engineering for Safe and Secure Computer Systems*, ERC Advanced Grant 789108, € 2 473 844. PI.
- 2018 – 2021 *CIFV: CHERI ISA Formal Verification*. DARPA/AFRL FA8650-18-C-7809, Cambridge/SRI International, \$ 828 648 at Cambridge. Joint with Robert Watson and Simon Moore at Cambridge, and Peter Neumann and Prashanth Mundkur at SRI.
- 2017 ARM donation, £ 370 000. Joint PI with Tim Jones, Simon Moore, Robert Watson.
- 2017 IBM Faculty Award, \$ 40 000. PI.
- 2013 – 2020 *REMS: Rigorous Engineering for Mainstream Systems*, EPSRC Programme Grant EP/K008528/1, with Imperial College and Edinburgh, £ 5 575 635. PI [\[project page\]](#).
- 2014 – 2018 *ARM Architectural Semantics*, EPSRC/ARM Industrial CASE PhD studentship, ARM funding £ 30 000 + EPSRC student maintenance and fees. PI.
- 2016 – 2017 *ARM Architectural Semantics Engineering*, EPSRC IAA KTF (Impact Acceleration Account Knowledge Transfer Fellowship for , Kathryn E. Gray). £ 51 276
- 2010 – 2014 *Semantic Foundations for Real-World Systems*. EPSRC Leadership Fellowship (EP/H005633/1), £ 1 522 106.
- 1999 – 2007 *Foundations of Distributed Programming: Wide-Area Systems and Semantics*. Royal Society University Research Fellowship. £ 264 515.
- 2008 – 2012 *Reasoning with Relaxed Memory Models* (PI). EPSRC standard grant EP/F036345/1. CIs Dr Kier Fraser and Dr Matthew Parkinson. £ 813 748.
- 2007 – 2010 *Applied Metarouting Project*. Tim Griffin (PI), Peter Sewell (CI). EPSRC standard grant EP/F002718. £ 404 009.
- 2005 – 2008 *NETSEM: Rigorous Semantics for Real Systems*. Peter Sewell (PI), Keith Wansbrough (CI), Richard Gibbens (CI). EPSRC standard grant EP/C510712. £ 282 163.
- 2005 – 2008 *Naming, Distribution, and Versioning: Programming Language Design and Implementation*. Peter Sewell (PI), Andrew Pitts (CI), Keith Wansbrough. EPSRC standard grant GR/T11715. £ 290 010.
- 2002 – 2005 *PEPITO: Peer-to-peer implementation and theory*. IST-2001-33234. This was a 6-site EC project, for which I was Cambridge site leader and Workpackage 1 manager. € 1 771 000 EC contribution (£ 180 060 at the Cambridge site).
- 2000 – 2003 *Wide-area programming: Language, Semantics and Infrastructure Design*. EPSRC standard grant GR/N24872. Peter Sewell (PI), Robin Milner (CI), James Leifer (co-author). £ 190 814.
- 1998 – 2001 *Calculi for Interactive Systems: Theory and Experiment*. Philippa Gardner (CI), Robin Milner (PI), Peter Sewell (co-author). EPSRC standard grant GR/L62290. £ 279 899.

# Publications

Papers are listed reverse-chronologically by category (journal, refereed conference, technical reports, ISO C/C++ standards committee papers, the RISC-V specification, PhD thesis, book chapters, software, short papers, and non-computer-science journal papers). A by-topic listing can be found at <https://www.cl.cam.ac.uk/~pes20/>.

Computer Science does not follow a uniform author ordering convention. In most of the following, the lead PhD student or postdoc authors are first, with myself last; others are alphabetical or by contribution. My group has also produced a number of other papers, not listed here, for which I provided advice and support but did not contribute as an author; they can be found on the group or lead-author web pages.

## Journal Papers (Computer Science)

- [1] The Arm Morello Evaluation Platform—Validating CHERI-Based Security in a High-Performance System. Richard Grisenthwaite, Graeme Barnes, Robert N. M. Watson, Simon W. Moore, Peter Sewell, and Jonathan Woodruff. **IEEE Micro**, 43(3):50–57, 2023. [[url](#)].
- [2] Isla: Integrating full-scale ISA semantics and axiomatic concurrency models (extended version). Alasdair Armstrong, Brian Campbell, Ben Simner, Christopher Pulte, and Peter Sewell. **Formal Methods in System Design**, May 2023. [[pdf](#)].
- [3] Engineering with Logic: Rigorous Test-Oracle Specification and Validation for TCP/IP and the Sockets API. Steve Bishop, Matthew Fairbairn, Hannes Mehnert, Michael Norrish, Tom Ridge, Peter Sewell, Michael Smith, and Keith Wansbrough. **J. ACM**, 66(1):1:1–1:77, December 2018. [[project page](#)]. [[pdf](#)].
- [4] CompCertTSO: A Verified Compiler for Relaxed-Memory Concurrency. Jaroslav Ševčík, Viktor Vafeiadis, Francesco Zappa Nardelli, Suresh Jagannathan, and Peter Sewell. **J. ACM**, 60(3):22:1–22:50, June 2013. [[project page](#)]. [[pdf](#)].
- [5] Fences in Weak Memory Models (Extended Version). Jade Alglave, Luc Maranget, Susmit Sarkar, and Peter Sewell. **Formal Methods in System Design**, 40(2):170–205, April 2012. [[pdf](#)].
- [6] Nomadic Pict: Programming Languages, Communication Infrastructure Overlays, and Semantics for Mobile Computation. Peter Sewell, Paweł Wojciechowski, and Asis Unyapoth. **ACM Transactions on Programming Languages and Systems (TOPLAS)**, 32(4):1–63 (and electronic appendix, 33pp), 2010. [[project page](#)]. [[pdf](#)].
- [7] x86-TSO: A Rigorous and Usable Programmer’s Model for x86 Multiprocessors. Peter Sewell, Susmit Sarkar, Scott Owens, Francesco Zappa Nardelli, and Magnus O. Myreen. **Communications of the ACM**, 53(7):89–97, July 2010. (Research Highlights). [[pdf](#)].
- [8] Acute: High-level programming language design for distributed computation. Peter Sewell, James J. Leifer, Keith Wansbrough, Francesco Zappa Nardelli, Mair Allen-Williams, Pierre Habouzit, and Viktor Vafeiadis. **Journal of Functional Programming**, 17(4–5):547–612, July 2007. Invited submission for an ICFP 2005 special issue. [[project page](#)]. [[pdf](#)].
- [9] Ott: Effective Tool Support for the Working Semanticist. Peter Sewell, Francesco Zappa Nardelli, Scott Owens, Gilles Peskine, Thomas Ridge, Susmit Sarkar, and Rok Strniša. **Journal of Functional Programming**, 20(1):70–122, January 2010. Invited submission from ICFP 2007, which was awarded the ACM SIGPLAN Most Influential ICFP 2007 Paper, in 2017. [[project page](#)]. [[pdf](#)].

- [10] Dynamic Rebinding for Marshalling and Update, via Redex-time and Destruct-time Reduction. Peter Sewell, Gareth Stoye, Michael Hicks, Gavin Bierman, and Keith Wansbrough. **Journal of Functional Programming**, 18(4):437–502, 2008. [\[pdf\]](#).
- [11] Mutatis Mutandis: Safe and predictable dynamic software updating. Gareth Stoye, Michael Hicks, Gavin Bierman, Peter Sewell, and Iulian Neamtiu. **ACM Transactions on Programming Languages and Systems (TOPLAS)**, 29(4):70pp, August 2007. [\[pdf\]](#).
- [12] Passive-attack analysis for connection-based anonymity systems. Andrei Serjantov and Peter Sewell. **International Journal of Information Security**, 4(3):172–180, June 2005. Special issue on ESORICS 2003. [\[url\]](#).
- [13] Models for Name-Passing Processes: Interleaving and Causal. Gian Luca Cattani and Peter Sewell. **Information and Computation**, 190(2):136–178, May 2004. [\[url\]](#).
- [14] Secure Composition of Untrusted Code: Box- $\pi$ , Wrappers and Causality Types. Peter Sewell and Jan Vitek. **Journal of Computer Security**, 11(2):135–188, 2003. Invited submission for a CSFW 00 special issue. [\[pdf\]](#).
- [15] Nomadic Pict: Language and Infrastructure Design for Mobile Agents. Paweł T. Wojciechowski and Peter Sewell. **IEEE Concurrency**, 8(2):42–52, April–June 2000. Invited submission for ASA/MA 99. [\[project page\]](#). [\[url\]](#).
- [16] From Rewrite Rules to Bisimulation Congruences. Peter Sewell. **Theoretical Computer Science**, 274(1–2):183–230, March 2002. Invited submission for a CONCUR 98 special issue. [\[pdf\]](#).
- [17] Nonaxiomatisability of Equivalences over Finite State Processes. Peter Sewell. **Annals of Pure and Applied Logic**, 90:163–191, December 1997. Invited submission from LICS '94. [\[pdf\]](#).

### Conference Papers (Refereed)

- [18] CN: Verifying systems C code with separation-logic refinement types. Christopher Pulte, Dhruv C. Makwana, Thomas Sewell, Kayvan Memarian, Peter Sewell, and Neel Krishnaswami. In **POPL 2023: Proceedings of the 50th ACM SIGPLAN Symposium on Principles of Programming Languages**. [\[project page\]](#). [\[pdf\]](#).
- [19] Islaris: Verification of Machine Code Against Authoritative ISA Semantics. Michael Sammler, Angus Hammond, Rodolphe Lepigre, Brian Campbell, Jean Pichon-Pharabod, Derek Dreyer, Deepak Garg, and Peter Sewell. In **PLDI 2022: Proceedings of the 43rd ACM SIGPLAN International Conference on Programming Language Design and Implementation**. [\[project page\]](#). [\[pdf\]](#).
- [20] Relaxed virtual memory in Armv8-A. Ben Simner, Alasdair Armstrong, Jean Pichon-Pharabod, Christopher Pulte, Richard Grisenthwaite, and Peter Sewell. In **ESOP 2022: Proceedings of the 31st European Symposium on Programming**. pages 143–173. [\[project page\]](#). [\[pdf\]](#).
- [21] Verified Security for the Morello Capability-enhanced Prototype Arm Architecture. Thomas Bauereiss, Brian Campbell, Thomas Sewell, Alasdair Armstrong, Lawrence Esswood, Ian Stark, Graeme Barnes, Robert N. M. Watson, and Peter Sewell. In **ESOP 2022: Proceedings of the 31st European Symposium on Programming**. pages 174–203. [\[project page\]](#). [\[pdf\]](#).



- [22] VIP: Verifying Real-World C Idioms with Integer-Pointer Casts. Rodolphe Lepigre, Michael Sammler, Kayvan Memarian, Robbert Krebbers, Derek Dreyer, and Peter Sewell. In **POPL 2022: Proceedings of the 49th ACM SIGPLAN Symposium on Principles of Programming Languages**. Proc. ACM Program. Lang. 6, POPL, Article 20. [[project page](#)]. [[pdf](#)].
- [23] Isla: Integrating full-scale ISA semantics and axiomatic concurrency models. Alasdair Armstrong, Brian Campbell, Ben Simner, Christopher Pulte, and Peter Sewell. In **CAV 2021: Proc. 33rd International Conference on Computer-Aided Verification**. pages 303–316. [[pdf](#)].
- [24] Rigorous engineering for hardware security: Formal modelling and proof in the CHERI design and implementation process. Kyndylan Nienhuis, Alexandre Joannou, Thomas Bauereiss, Anthony Fox, Michael Roe, Brian Campbell, Matthew Naylor, Robert M. Norton, Simon W. Moore, Peter G. Neumann, Ian Stark, Robert N. M. Watson, and Peter Sewell. In **Security and Privacy 2020: Proceedings of the 41st IEEE Symposium on Security and Privacy (SP)**. pages 1007–1024. [[project page](#)]. [[pdf](#)].
- [25] Cornucopia: Temporal Safety for CHERI Heaps. Nathaniel Wesley Filardo, Brett F. Gutstein, Jonathan Woodruff, Sam Ainsworth, Lucian Paul-Trifu, Brooks Davis, Hongyan Xia, Edward Tomasz Napierala, Alexander Richardson, John Baldwin, David Chisnall, Jessica Clarke, Khilan Gudka, Alexandre Joannou, A. Theodore Markettos, Alfredo Mazinghi, Robert M. Norton, Michael Roe, Peter Sewell, Stacey Son, Timothy M. Jones, Simon W. Moore, Peter G. Neumann, and Robert N. M. Watson. In **Security and Privacy 2020: Proceedings of the 41st IEEE Symposium on Security and Privacy (SP)**. pages 1507–1524. [[project page](#)]. [[pdf](#)].
- [26] ARMv8-A system semantics: instruction fetch in relaxed architectures. Ben Simner, Shaked Flur, Christopher Pulte, Alasdair Armstrong, Jean Pichon-Pharabod, Luc Maranget, and Peter Sewell. In **ESOP 2020: Proceedings of the 29th European Symposium on Programming**. [[project page](#)]. [[pdf](#)].
- [27] Cerberus-BMC: a Principled Reference Semantics and Exploration Tool for Concurrent and Sequential C. Stella Lau, Victor B. F. Gomes, Kayvan Memarian, Jean Pichon-Pharabod, and Peter Sewell. In **CAV 2019: Proc. 31st International Conference on Computer-Aided Verification**. [[project page](#)]. [[pdf](#)].
- [28] CheriABI: Enforcing Valid Pointer Provenance and Minimizing Pointer Privilege in the POSIX C Run-time Environment. Brooks Davis, Robert N. M. Watson, Alexander Richardson, Peter G. Neumann, Simon W. Moore, John Baldwin, David Chisnall, James Clarke, Nathaniel Wesley Filardo, Khilan Gudka, Alexandre Joannou, Ben Laurie, A. Theodore Markettos, J. Edward Maste, Alfredo Mazinghi, Edward Tomasz Napierala, Robert M. Norton, Michael Roe, Peter Sewell, Stacey Son, and Jonathan Woodruff. In **ASPLOS 2019: the 24th ACM International Conference on Architectural Support for Programming Languages and Operating Systems**. Best paper award. [[project page](#)]. [[pdf](#)].
- [29] ISA Semantics for ARMv8-A, RISC-V, and CHERI-MIPS. Alasdair Armstrong, Thomas Bauereiss, Brian Campbell, Alastair Reid, Kathryn E. Gray, Robert M. Norton, Prashanth Mundkur, Mark Wassell, Jon French, Christopher Pulte, Shaked Flur, Ian Stark, Neel Krishnaswami, and Peter Sewell. In **POPL 2019: Proceedings of the 46th ACM SIGPLAN Symposium on Principles of Programming Languages**. Proc. ACM Program. Lang. 3, POPL, Article 71. [[project page](#)]. [[pdf](#)].
- [30] Exploring C Semantics and Pointer Provenance. Kayvan Memarian, Victor B. F. Gomes, Brooks Davis, Stephen Kell, Alexander Richardson, Robert N. M. Watson, and Peter Sewell.

- In **POPL 2019**: *Proceedings of the 46th ACM SIGPLAN Symposium on Principles of Programming Languages*. Proc. ACM Program. Lang. 3, POPL, Article 67. Also available as ISO/IEC JTC1/SC22/WG14 N2311. [\[project page\]](#). [\[pdf\]](#).
- [31] Simplifying ARM Concurrency: Multicopy-atomic Axiomatic and Operational Models for ARMv8. Christopher Pulte, Shaked Flur, Will Deacon, Jon French, Susmit Sarkar, and Peter Sewell. In **POPL 2018**: *Proceedings of the 45th ACM SIGPLAN Symposium on Principles of Programming Languages*. [\[project page\]](#). [\[pdf\]](#).
- [32] Mixed-size Concurrency: ARM, POWER, C/C++11, and SC. Shaked Flur, Susmit Sarkar, Christopher Pulte, Kyndylan Nienhuis, Luc Maranget, Kathryn E. Gray, Ali Sezgin, Mark Batty, and Peter Sewell. In **POPL 2017**: *Proceedings of the 44th ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (Paris)*. pages 429–442. [\[project page\]](#). [\[pdf\]](#).
- [33] The missing link: explaining ELF static linking, semantically. Stephen Kell, Dominic P. Mulligan, and Peter Sewell. In **OOPSLA 2016**: *Proceedings of the ACM SIGPLAN International Conference on Object-Oriented Programming, Systems, Languages, and Applications*. [\[project page\]](#). [\[pdf\]](#).
- [34] An operational semantics for C/C++11 concurrency. Kyndylan Nienhuis, Kayvan Memarian, and Peter Sewell. In **OOPSLA 2016**: *Proceedings of the ACM SIGPLAN International Conference on Object-Oriented Programming, Systems, Languages, and Applications*. [\[pdf\]](#).
- [35] Into the depths of C: elaborating the de facto standards. Kayvan Memarian, Justus Matthiesen, James Lingard, Kyndylan Nienhuis, David Chisnall, Robert N.M. Watson, and Peter Sewell. In **PLDI 2016**: *Proceedings of the 37th ACM SIGPLAN conference on Programming Language Design and Implementation*. PLDI 2016 Distinguished Paper award. [\[project page\]](#). [\[pdf\]](#).
- [36] Modelling the ARMv8 architecture, operationally: concurrency and ISA. Shaked Flur, Kathryn E. Gray, Christopher Pulte, Susmit Sarkar, Ali Sezgin, Luc Maranget, Will Deacon, and Peter Sewell. In **POPL 2016**: *Proceedings of the 43rd ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (St. Petersburg, FL, USA)*. pages 608–621. [\[project page\]](#). [\[pdf\]](#).
- [37] A concurrency semantics for relaxed atomics that permits optimisation and avoids thin-air executions. Jean Pichon-Pharabod and Peter Sewell. In **POPL 2016**: *Proceedings of the 43rd ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (St. Petersburg, FL, USA)*. pages 622–633. [\[project page\]](#). [\[pdf\]](#).
- [38] An integrated concurrency and core-ISA architectural envelope definition, and test oracle, for IBM POWER multiprocessors. Kathryn E. Gray, Gabriel Kerneis, Dominic P. Mulligan, Christopher Pulte, Susmit Sarkar, and Peter Sewell. In **MICRO 2015**: *Proceedings of the 48th International Symposium on Microarchitecture (Waikiki)*. pages 635–646. [\[pdf\]](#).
- [39] SibylFS: formal specification and oracle-based testing for POSIX and real-world file systems. Tom Ridge, David Sheets, Thomas Tuerk, Andrea Giugliano, Anil Madhavapeddy, and Peter Sewell. In **SOSP 2015**: *Proceedings of the 25th Symposium on Operating Systems Principles, Monterey, CA, USA*. pages 38–53. [\[project page\]](#). [\[pdf\]](#).
- [40] The Problem of Programming Language Concurrency Semantics. Mark Batty, Kayvan Memarian, Kyndylan Nienhuis, Jean Pichon-Pharabod, and Peter Sewell. In **ESOP 2015**: *Programming Languages and Systems – 24th European Symposium on Programming, European Joint Conferences on Theory and Practice of Software (ETAPS) (London)*. pages 283–307. [\[pdf\]](#).

- [41] Not-Quite-So-Broken TLS: Lessons in Re-Engineering a Security Protocol Specification and Implementation. David Kaloper-Mersinjak, Hannes Mehnert, Anil Madhavapeddy, and Peter Sewell. In **USENIX Security 2015: 24th USENIX Security Symposium (Washington D.C.)**. pages 223–238. [[project page](#)]. [[pdf](#)].
- [42] Lem: Reusable Engineering of Real-world Semantics. Dominic P. Mulligan, Scott Owens, Kathryn E. Gray, Tom Ridge, and Peter Sewell. In **ICFP 2014: Proceedings of the 19th ACM SIGPLAN International Conference on Functional Programming**. pages 175–188. [[project page](#)]. [[pdf](#)].
- [43] An Axiomatic Memory Model for POWER Multiprocessors. Sela Mador-Haim, Luc Maranget, Susmit Sarkar, Kayvan Memarian, Jade Alglave, Scott Owens, Rajeev Alur, Milo M. K. Martin, Peter Sewell, and Derek Williams. In **CAV 2012: Proceedings of the 24th International Conference on Computer Aided Verification**. pages 495–512. [[pdf](#)].
- [44] Synchronising C/C++ and POWER. Susmit Sarkar, Kayvan Memarian, Scott Owens, Mark Batty, Peter Sewell, Luc Maranget, Jade Alglave, and Derek Williams. In **PLDI 2012: Proceedings of the 33rd ACM SIGPLAN conference on Programming Language Design and Implementation (Beijing)**. pages 311–322. [[project page](#)]. [[pdf](#)].
- [45] Clarifying and Compiling C/C++ Concurrency: from C++11 to POWER. Mark Batty, Kayvan Memarian, Scott Owens, Susmit Sarkar, and Peter Sewell. In **POPL 2012: Proceedings of the 39th ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (Philadelphia)**. pages 509–520. [[project page](#)]. [[pdf](#)].
- [46] Lem: A Lightweight Tool for Heavyweight Semantics. Scott Owens, Peter Böhm, Francesco Zappa Nardelli, and Peter Sewell. In **ITP 2011: Proceedings of Interactive Theorem Proving – Second International Conference (previously TPHOLs) (Berg en Dal), LNCS 6898**. pages 363–369, (Rough Diamond). [[project page](#)]. [[url](#)].
- [47] Understanding POWER Multiprocessors. Susmit Sarkar, Peter Sewell, Jade Alglave, Luc Maranget, and Derek Williams. In **PLDI 2011: Proceedings of the 32nd ACM SIGPLAN conference on Programming Language Design and Implementation**. pages 175–186. [[project page](#)]. [[pdf](#)].
- [48] Litmus: running tests against hardware. Jade Alglave, Luc Maranget, Susmit Sarkar, and Peter Sewell. In **TACAS 2011: Proceedings of the 17th international conference on Tools and Algorithms for the Construction and Analysis of Systems**. pages 41–44. [[pdf](#)].
- [49] Relaxed-Memory Concurrency and Verified Compilation. Jaroslav Ševčík, Viktor Vafeiadis, Francesco Zappa Nardelli, Suresh Jagannathan, and Peter Sewell. In **POPL 2011: Proceedings of the 38th ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages**. pages 43–54. [[project page](#)]. [[pdf](#)].
- [50] Mathematizing C++ Concurrency. Mark Batty, Scott Owens, Susmit Sarkar, Peter Sewell, and Tjark Weber. In **POPL 2011: Proceedings of the 38th ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages**. pages 55–66. [[pdf](#)].
- [51] Fences in Weak Memory Models. Jade Alglave, Luc Maranget, Susmit Sarkar, and Peter Sewell. In **CAV 2010: Proceedings of the 22nd International Conference on Computer Aided Verification, LNCS 6174**. pages 258–272. [[pdf](#)].



- [52] A better x86 memory model: x86-TSO. Scott Owens, Susmit Sarkar, and Peter Sewell. In **TPHOLs 2009: Proceedings of Theorem Proving in Higher Order Logics**, LNCS 5674. pages 391–407. [pdf].
- [53] The Semantics of Power and ARM Multiprocessor Machine Code. Jade Alglave, Anthony Fox, Samin Ishtiaq, Magnus O. Myreen, Susmit Sarkar, Peter Sewell, and Francesco Zappa Nardelli. In **DAMP 2009: Proceedings of the 4th Workshop on Declarative Aspects of Multicore Programming**. [pdf].
- [54] The Semantics of x86-CC Multiprocessor Machine Code. Susmit Sarkar, Peter Sewell, Francesco Zappa Nardelli, Scott Owens, Tom Ridge, Thomas Braibant, Magnus Myreen, and Jade Alglave. In **POPL 2009: Proceedings of the 36th ACM SIGPLAN-SIGACT symposium on Principles of Programming Languages**. pages 379–391. [pdf].
- [55] A rigorous approach to networking: TCP, from implementation to protocol to service. Tom Ridge, Michael Norrish, and Peter Sewell. In **FM 2008: Proceedings of the 15th International Symposium on Formal Methods (Turku, Finland)**, LNCS 5014. pages 294–309. [project page]. [pdf].
- [56] Ott: Effective Tool Support for the Working Semanticist. Peter Sewell, Francesco Zappa Nardelli, Scott Owens, Gilles Peskine, Thomas Ridge, Susmit Sarkar, and Rok Strniša. In **ICFP 2007: Proceedings of the 12th ACM SIGPLAN International Conference on Functional Programming (Freiburg)**. pages 1–12, ACM SIGPLAN Most Influential ICFP Paper Award 2017 (for 2007). [project page]. [pdf].
- [57] The Java Module System: core design and semantic definition. Rok Strniša, Peter Sewell, and Matthew Parkinson. In **OOPSLA 2007: Proceedings of the 22nd ACM SIGPLAN International Conference on Object-Oriented Programming, Systems, Languages and Applications (Montréal)**. pages 499–514. [project page]. [pdf].
- [58] Rigorous Protocol Design in Practice: An Optical Packet-Switch MAC in HOL. Adam Biltcliffe, Michael Dales, Sam Jansen, Thomas Ridge, and Peter Sewell. In **ICNP 2006: Proceedings of the 14th IEEE International Conference on Network Protocols (Santa Barbara)**. pages 117–126, See also the SWIFT MAC Protocol: HOL Specification at <http://www.cl.cam.ac.uk/~pes20/optical/spec.pdf>. [project page]. [pdf].
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