

# James Cheney

Informatics Forum 5.29  
10 Crichton Street  
University of Edinburgh  
Edinburgh, EH8 9AB  
Scotland

Phone: +44 131 651 5658  
Email: [jcheney@inf.ed.ac.uk](mailto:jcheney@inf.ed.ac.uk)  
Homepage: <http://homepages.inf.ed.ac.uk/jcheney>  
United States citizen  
United Kingdom citizen

## Research interests

Programming languages, logic, scientific databases, provenance, security, verification.

## Education

**Doctor of Philosophy, Computer Science**, 2004, Cornell University, Ithaca, NY.

**Master of Science, Mathematics**, 1998, Carnegie Mellon University, Pittsburgh, PA.

**Bachelor of Science, Computer Science and Mathematics**, 1998, Carnegie Mellon University, Pittsburgh, PA.

## Experience

**Professor and Personal Chair of Programming Languages and Systems**, Laboratory for Foundations of Computer Science, University of Edinburgh. August 2022–present

**Turing Fellow**, The Alan Turing Institute, September 2018–present.

**Reader**, Laboratory for Foundations of Computer Science, University of Edinburgh. August 2015–August 2022

**Royal Society University Research Fellow**, Laboratory for Foundations of Computer Science, University of Edinburgh. October 2008–December 2016.

**Instructor**, Elements of Programming Languages, University of Edinburgh, 2015–2017.

**Instructor**, Logic Programming, University of Edinburgh, 2009–2011, 2014.

**Instructor**, Distributed Systems, University of Edinburgh, 2014.

**Instructor**, Querying and Storing XML, University of Edinburgh, 2013.

**Visiting researcher**, Toyota Technological Institute, Chicago, Summer 2009.

**Postdoctoral researcher**, Database Group, University of Edinburgh, 2004–2008.

## Awards

**2016 ACM SIGMOD Test-of-Time Award** for the paper “Provenance management in curated databases” (SIGMOD 2006) with P. Buneman and A. Chapman

## Funding

**Programming Foundations for Trusted Data Science**, £285,259, ISCF joint appointment funding with UK National Physical Laboratory.

**Probabilistic Property-based Testing** (PhD studentship), with Vaishak Belle, £128,788, Huawei Edinburgh Research Laboratory.

**Mechanising the Metatheory of SQL with Nulls**, with Wilmer Ricciotti, £65,893, *Research Institute on Verified Trustworthy Software Systems*, UK National Cyber Security Centre.

Small grant for research visit travel costs, £2300, GCHQ

**Skye: Bridging Theory and Practice for Scientific Data Curation**, €1,995,181, ERC Consolidator Grant. September 2016–August 2021.

**Declarative Programming for Data Science**, studentship in the Edinburgh Centre for Doctoral Training in Data Science, £80,000 co-funded by LogicBlox, Inc.

**A Diagnostics Approach to Advanced Persistent Threat Detection (ADAPT)**, \$720,102, Defense Advanced Research Projects Agency, with David Archer (Galois, Inc.), Hoda Eldardiry (Xerox PARC), and Alan Fern (Oregon State University). July 2015–June 2019.

**Foundations of Language-Based Provenance Security (renewal)**, £392,531, European Office of Aerospace Research and Development, US Air Force Office of Scientific Research. July 2014–June 2018.

**Google Faculty Research Award, *Language-Integrated Provenance***, \$56,925, with Paul Anderson. September 2014–August 2015.

**Royal Society University Research Fellowship (extension) *Nominal abstract syntax: automata, mechanised metatheory, and type theory***, £247,973, December 2013–December 2016.

**A Theory of Least Change for Bidirectional Transformations**, £395,170 (out of £704,188 total), EPSRC (EP/K020218/1), with Perdita Stevens (PI), James McKinna and Jeremy Gibbons (Oxford), March 2013–November 2016.

**Provenance-based Security for Configuration Languages**, with Paul Anderson, Microsoft Research PhD Studentship, awarded 2013.

**DIACHRON – Managing the Evolution and Preservation of the Data Web**, €435,837 (out of €4,989,996 total), with S. Viglas (Edinburgh PI) and P. Buneman, EU FP7 Integrating Project (601043), April 2013–March 2016.

**Foundations of Language-Based Provenance Security**, £72,942, European Office of Aerospace Research and Development, US Air Force Office of Scientific Research. January 2013–June 2014.

**Google Faculty Research Award, *Synchronized Database Wikis***, \$38,613, with S. Lindley. January–December 2012.

**Google Faculty Research Award, *Database Wikis***, \$81,679, with S. Lindley. January–December 2011.

**University of Edinburgh IDEA Lab Proof of Principle Prototyping Project, *Database Wiki***, £15,500, with P. Buneman and H. Müller and S. Lindley. April–July 2010.

**Royal Society University Research Fellowship, *Mechanising metatheory with nominal logic programming***, £415,068, October 2008–December 2013. (Success rate  $32/592 = 5.4\%$ )

**UK eScience Institute Theme Programme on *Principles of Provenance***, £54,060, with P. Buneman (University of Edinburgh) and B. Ludaescher (University of California, Davis). April 2008–May 2009.

## Consultancy

*Scoping study on provenance, curation, and data quality*, National Physical Laboratory, July 2017–March 2018. With A. Chapman (Southampton) and J. Davidson (Glasgow).

## Research Leadership

**PC co-chair**, 24th Symposium on Practical Aspects of Declarative Languages, 2022.

**PC co-chair**, 22nd Symposium on Principles and Practice of Declarative Programming, 2020.

**Co-organizer**, workshop on “Provenance, Security and Machine Learning”, The Alan Turing Institute, November 2019.

**Steering committee chair**, International Symposium on Principles and Practice of Declarative Programming (PPDP), 2019–present.

**PC co-chair**, 8th workshop on Bidirectional Transformations, 2019.

**General chair**, 18th International Symposium on Principles and Practice of Declarative Programming (PPDP 2016), September 5-7, 2016

**Local organizer**, 26th International Symposium on Logic-based Program Synthesis and Transformation (LOPSTR 2016), Edinburgh, September 6–8, 2016.

**Local organizer**, 23rd International Static Analysis Symposium (SAS 2016), September 8–11, 2016.

**Co-organizer**, Workshop on Provenance-Based Security and Transparent Computing, Washington, DC, June 6, 2016.

**Program committee co-chair**, 15th International Symposium on Database Programming Languages (DBPL 2015), Pittsburgh, Pennsylvania, October 27, 2015.

**Local organizer**, 7th USENIX Workshop on Theory and Practice of Provenance, in cooperation with ACM SIGPLAN and SIGMOD, Edinburgh, UK, July 8-9, 2015.

**Co-organizer**, Dagstuhl Seminar on Programming Languages for Big Data, December 15–19, 2014.

**Program committee co-chair**, First Workshop on Cross-model Language Design and Implementation (XLDI 2012), Copenhagen, Denmark, September 9, 2012.

**Co-organizer**, Dagstuhl Seminar on Principles of Provenance, February 27–March 2, 2012.

**Member**, W3C Provenance Incubator Group (co-author of final report) and W3C Provenance Interchange Working Group (contributor to PROV-O ontology and editor of PROV-CONSTRAINTS recommendation).

**Program committee co-chair**, 4th International Workshop on Logical Frameworks and Metalanguages, Theory and Practice (LFMTP 2009), August 2, 2009, Montreal, Canada.

**Program committee chair**, 1st Workshop on Theory and Practice of Provenance (TAPP 2009), February 23, 2009, San Francisco, CA.

**Steering committee chair**, Workshop on Theory and Practice of Provenance (TAPP), 2012–2020.

**Theme Leader**, UK eScience Institute Theme Programme on *Principles of Provenance*, 2008–2009.

## Professional Service

**PC member**, FSCD 2022, OOPSLA 2021, PPDP 2021, EuroSys 2020, ICDT 2020, CDKE 2020, CPP 2018, PADL 2018, POPL 2018, PPDP 2017, SIGMOD 2017, Haskell Symposium 2016, IPAW 2016, FOIKS 2016, APLAS 2015, BICOD 2015, POST 2015, ICALP 2015, IFIP 2014, CIKM 2014, POPL 2014, BNCOD 2013, LFMTP 2013, IEEE BigData 2013, CSF 2013, ICDT 2013, ICALP 2012, PODS 2012, ICLP 2011, Haskell Symposium 2010, ICFP 2010, WWW 2009, POPL 2009, CIKM 2008, WebDB 2007, DBPL 2005

**External review committee member**, ICFP 2019, ICFP 2016, POPL 2012

**Co-editor**, special issue of the Journal of Functional Programming on Programming Languages for Big Data

**Co-editor**, special issue of ACM Transactions on Internet Technology on provenance

**Co-editor**, special issue of the Journal of Functional Programming on ICFP 2010

**Referee**, Communications of the ACM, Information Processing Letters, Journal of Computer and System Sciences, Journal of Functional Programming, Journal of Logic and Computation, Journal of Logical and Algebraic Methods in Programming, Journal of Symbolic Logic, Journal of the ACM, Logical Methods in Computer Science, Mathematical Structures in Computer Science, Science of Computer Programming, Theoretical Computer Science, Theory and Practice of Logic Programming, Transactions on Computational Logic, Transactions on Database Systems, Transactions on Information Systems, Transactions on Internet Technology, Transactions on Programming Languages and Systems, Transactions on Software Engineering Methodology, VLDB Journal

**Reviewer**, Independent Research Fund Denmark, European Research Council, French National Research Agency; Icelandic Research Fund; Israeli Science Foundation; Royal Society International Exchanges Committee; UK Engineering and Physical Sciences Research Council; UK Research and Innovation

**LFCS Seminar organizer**, September 2011–August 2013

## Supervision

### Postdoctoral research assistants

Vashti Galpin, 2020–present

Simon Fowler, 2019–2020, now at University of Glasgow

Sidahmed Benabderrahmane, 2017–2019, now at NYU

Ghita Berrada, 2016–2019, now at King’s College, London

Adria Gascon, 2015–2016 (part time); now at Google

Jan Stolarek, 2015–2021

Wilmer Ricciotti, 2014–present

Roly Perera, 2013–14 (full time) and 2015–2018 (part time), now at The Alan Turing Institute

Sam Lindley, 2010–11; now at University of Edinburgh

### PhD students

**Supervisor**, Sándor Bartha (2018–present) with V. Belle (second supervisor).

**Supervisor**, Rudi Horn (2017–present) with S. Fowler (second supervisor). Submitted.

**Supervisor**, Frank Emrich (2017–present) with S. Lindley (second supervisor).

**Supervisor**, Ben Kavanagh, (2009–2021, part-time), with P. Wadler (co-supervisor). Exceeded allowed time to submit.

**Supervisor**, Sheung Chi (Arthur) Chan (2015–2020), with P. Bhatotia (second supervisor). Thesis: “Analysing system behaviour by automatic benchmarking of system-level provenance”, 2020.

**Supervisor**, Weili Fu (2014–2019), with P. Anderson (co-supervisor). Thesis: “Semantics and Provenance of Configuration Programming Language  $\mu$ Puppet”, 2019.

**Supervisor**, Stefan Fehrenbach, PhD (2014–2019), with P. Buneman (second supervisor). Thesis: “Language-integrated provenance”, 2019.

**Second supervisor**, Alessandro Spinuso, PhD, (2011–2018, part-time), with M. P. Atkinson (lead supervisor). Thesis: “Active Provenance for Data Intensive Research”, 2018.

## Habilitation examination

**Jury member**, Dr. Slawomir Staworko, Habilitation a diriger des recherches, Université de Lille, December 2015

## PhD examination

**External examiner**, Julien Lopez, PhD. Computer science, Université Paris-Sud, 2019. Topic: “Au-delà des frontières entre moteurs d’exécution langages de programmation et bases de données”.

**Internal examiner**, Jack Williams, PhD. Computer Science, University of Edinburgh, 2019. Topic: “Design and Evaluation of Contracts for Gradual Typing”.

**External examiner**, Angshuman Jana, PhD. Computer Science, IIT Patna, 2018. Topic: “Semantics-based Dependency Analysis of Database Applications by Abstract Interpretation”

**External examiner**, Francisco Ferreira Ruiz, PhD. McGill University, 2018. Topic: “Proofs and programs about open terms”.

**Internal examiner**, Fabian Peternek, PhD. Computer Science, University of Edinburgh 2017. Topic: “Graph Compression using Graph Grammars”.

**Internal examiner**, Danel Ahman, PhD. Computer Science, University of Edinburgh 2017. Topic: “Fibred Computational Effects”.

**External examiner**, Jesus Dominguez, PhD. Computer Science, King’s College London 2016. Topic: “Comparing Combinatory Reduction Systems and Nominal Rewrite systems with atom substitution”.

**Internal examiner**, YuHui Lin, PhD. Computer Science, University of Edinburgh 2015. Topic: “The Use of Rippling to Automate Event-B Invariant Preservation Proofs”.

**Internal examiner**, Gavin Keighren, PhD. Computer Science, University of Edinburgh 2014. Topic: “Restricting Information Flow in Security APIs by Typing”.

**Internal examiner**, John Hewson, PhD. Computer Science, University of Edinburgh 2013. Topic: “Constraint-Based Specifications for System Configuration”.

**External examiner**, Gareth Smith, PhD. Computer Science, Imperial College, London, 2011. Topic: “Local Reasoning about Web Programs”.

**Internal examiner**, Ezra Cooper, PhD. Computer Science, University of Edinburgh, 2009. Topic: “Programming Language Features for Web Application Development”.

## MSc students

Sándor Bartha, MRes (distinction). Centre for Doctoral Training in Data Science, University of Edinburgh, 2018. Topic: “Meta-interpretive learning of programming language semantics”.

Himan Mookherjee, MRes (merit). Centre for Doctoral Training in Data Science, University of Edinburgh, 2018. Topic: “Evaluation of unsupervised anomaly detectors using operating system level application data”.

Rudi Horn, MRes (distinction). Centre for Doctoral Training in Pervasive Parallelism, University of Edinburgh, 2017. Topic: “Language integrated incremental relational lenses”.

Osama Almurshed, MSc. Computer Science, 2017. Topic: “Survey Management Application LinksSurvey: Evaluating Links Web Programming Language”.

Jie Li, MSc. Computer Science, 2017. Topic: “Evaluating Web Programming Languages”.

Jiehua Zeng, MSc. Computer Science, 2017. Topic: “Evaluating Links, a Web Programming Language”.

Valentin Caloean, MSc. Computer Science (merit), 2016. Topic: “Parsing And Interpreting The Puppet Configuration Language”.

Wen Shi, MSc. Informatics (distinction), University of Edinburgh, 2015. Topic: “Evaluating XML/tree constraint solving algorithms”

Zhuowei Yang, MSc. Informatics, University of Edinburgh, 2015. Topic: “Database Wiki: Role-based access control model”.

Mingjun Han, MSc. Informatics, University of Edinburgh, 2014. Topic: “Improving access control policies for DBWiki”.

Shasha Song, MSc. Informatics, University of Edinburgh, 2013. Topic: “Database Wiki: Bidirectional synchronization”.

Danlin Gu, MSc. Artificial Intelligence, University of Edinburgh, 2013. Topic: “DBWiki: Image Annotation”.

Rustam Aliyev, MSc. Computer Science, University of Edinburgh, 2012. Topic: “Database Wiki: Query Optimization”.

Mindaugas Tvaronavicius, MSc. Informatics, University of Edinburgh, 2012. Topic: “Update History Visualization in a Database Wiki”.

Jiayan Qin, MSc. Informatics, University of Edinburgh, 2012. Topic: “Data visualization based on embedded query for Database Wiki”.

Haoli Qu, MSc. Informatics, University of Edinburgh, 2011. Topic: “Chart/graph-based visualization and geospatial visualization for Database Wiki data”.

Hui Li, MSc. Informatics, University of Edinburgh, 2011. Topic: “Query optimization for a Database Wiki”.

Snehal Waychal, MSc. Informatics, University of Edinburgh, 2011. Topic: “Database Wiki: provenance, querying and visualization”.

Tom Bo Liu, MSc. Informatics, University of Edinburgh, 2010. Topic: “Design and implementation of XML access control for a Web database”.

## Publications

### Journal articles

1. Wilmer Ricciotti and James Cheney. Strongly normalizing higher-order queries. In press, *Logical Methods in Computer Science*. **Invited special issue on best papers of FSCD 2020.**
2. Wilmer Ricciotti and James Cheney. A formalization of SQL with nulls. Published online, *Journal of Automated Reasoning*.
3. Simon Fowler, Simon Harding, Joanna Sharman, and James Cheney. Cross-tier web programming for curated databases: a case study. *International Journal of Digital Curation*, 16(1), 2021.
4. Kwanghoon Choi, James Cheney, Simon Fowler and Sam Lindley. A Polymorphic RPC Calculus. *Science of Computer Programming*, 197:102499, October 2020.
5. Ghita Berrada, James Cheney, Sidahmed Benabderrahmane, William Maxwell, Himan Mookherjee, Alec Theriault, and Ryan Wright. A baseline for unsupervised advanced persistent threat detection in system-level provenance. *Future Generation Computer Systems*, 108:401–413, 2020.
6. Roly Perera and James Cheney. Proof-relevant  $\pi$ -calculus: a constructive approach to concurrency and causality. *Mathematical Structures in Computer Science*, 28(9):1541–1577, 2018. **Invited special issue on best papers of LFMTP 2015.**
7. Jan Stolarek and James Cheney. Language-integrated provenance in Haskell. *The Art, Science and Engineering of Programming*, 2(3):A11, 2018.
8. Stefan Fehrenbach and James Cheney. Language-integrated provenance. *Science of Computer Programming*, 155:103–145, 2018. **Invited special issue on best papers of PPDP 2016.**

9. James Cheney, Jeremy Gibbons, James McKinna, and Perdita Stevens. On principles of Least Change and Least Surprise for bidirectional transformations. *Journal of Object Technology*, volume 16, no. 1 (February 2017), 3:1–31, 2017. **Invited special issue on best papers of BX 2015.**
10. James Cheney and Alberto Momigliano.  $\alpha$ Check: A mechanized metatheory model-checker. *Theory and Practice of Logic Programming*, 17(3):311–352, 2017.
11. James Cheney. A simple sequent calculus for nominal logic. *Journal of Logic and Computation* 26(2):699–726, 2016.
12. Luc Moreau, Paul Groth, James Cheney, Simon Miles and Timothy Lebo. The rationale of PROV. *Journal of Web Semantics*, 35 (2015) 235–257, 2015.
13. Timothy McPhillips, Tianhong Song, Tyler Kolisnik, Steve Aulenbach, Khalid Belhajjame, R. Kyle Bocinsky, Yang Cao, James Cheney, Fernando Chirigati, Saumen Dey, Juliana Freire, Christopher Jones, James Hanken, Keith W. Kintigh, Timothy A. Kohler, David Koop, James A. Macklin, Paolo Missier, Mark Schildhauer, Christopher Schwalm, Yaxing Wei, Mark Bieda, and Bertram Ludäscher. YesWorkflow: A User-Oriented, Language-Independent Tool for Recovering Workflow Information from Scripts. *International Journal of Digital Curation*, 10(1):298–313, 2015.
14. Umut A. Acar, Amal Ahmed, James Cheney and Roly Perera. A core calculus for provenance. *Journal of Computer Security*, 21:919–969, 2013. **Invited special issue on best papers of POST 2012.**
15. James Cheney. Revisiting “Forward Node-Selecting Queries over Trees”. *Transactions on Database Systems* 38(2):13, 2013.
16. Loreto Bravo, James Cheney, Irini Fundulaki and Ricardo Segovia. Consistency and repair for XML write-access control policies. *VLDB Journal*, 21(6):843–867, 2012.
17. Paul Groth, Yolanda Gil, James Cheney and Simon Miles. Requirements for Provenance on the Web. *International Journal of Digital Curation*, 7:1:39–56, 2012.
18. James Cheney, Michael Norrish, and René Vestergaard. Formalizing adequacy for higher-order abstract syntax: a case study. *Journal of Automated Reasoning*, 49(2):209–239, 2012.
19. James Cheney. A dependent nominal type theory. *Logical Methods in Computer Science*, 8(1):A8, 2012.
20. James Cheney, Amal Ahmed, and Umut A. Acar. Provenance as dependency analysis. *Mathematical Structures in Computer Science*, 21(6):1301–1337, 2011.
21. Christian Urban, James Cheney and Stefan Berghofer. Mechanizing the Metatheory of LF. *ACM Transactions on Computational Logic*, 12(2):A15, 2011.
22. James Cheney. Equivariant unification. *Journal of Automated Reasoning*, 45(3):267–300, 2010.
23. James Cheney, Laura Chiticariu, and Wang-Chiew Tan. Provenance in databases: Why, how, and where. *Foundations and Trends in Databases*, 1(4):379–474, 2009.
24. Peter Buneman, James Cheney, and Stijn Vansummeren. On the expressiveness of implicit provenance in query and update languages. *ACM Transactions on Database Systems*, 33(4):28, November 2008. **Invited special issue on best papers of ICDT 2007.**
25. James Cheney and Christian Urban. Nominal logic programming. *ACM Transactions on Programming Languages and Systems*, 30(5):26, August 2008.
26. James Cheney. Completeness and Herbrand theorems for nominal logic. *Journal of Symbolic Logic*, 71(1):299–320, 2006.

## Conference papers

1. James Cheney and Maribel Fernández. Nominal matching logic. In *Proceedings of the 2022 International Symposium on Principles and Practice of Declarative Programming (PPDP 2022)*, to appear.
2. Frank Emrich, Jan Stolarek, James Cheney and Sam Lindley. Constraint-based type inference for FreezeML. In *Proceedings of the 2022 ACM International Conference on Functional Programming (ICFP 2022)*, to appear.
3. Sándor Bartha, James Cheney, and Vaishak Belle. One down, 699 to go; or, synthesizing compositional desugarings. In *Proceedings of the 2021 ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA 2021)*, PACM:PL 5(OOPSLA):122:1–122:29, 2021.
4. Sidahmed Benabderrahmane, Ghita Berrada, James Cheney, and Petko Valtchev. A Rule Mining-based Advanced Persistent Threats Detection System. In *Proceedings of the 30th International Joint Conference on Artificial Intelligence (IJCAI 2021)*, to appear, 2021.
5. Wilmer Ricciotti and James Cheney. Query lifting: language-integrated query for heterogeneous nested collections. In *Proceedings of the 30th European Symposium on Programming (ESOP 2021)*, p. 579–606, 2021.
6. Simon Fowler, Simon Harding, Joanna Sharman, and James Cheney. Cross-tier web programming for curated databases: a case study. In *Pre-proceedings of the 15th International Digital Curation Conference (IDCC 2020)*, published in volume 15(1) of the International Journal of Digital Curation, 2020.
7. Wilmer Ricciotti and James Cheney. Strongly normalizing higher-order relational queries. In *Proceedings of the 5th International Conference on Formal Structures for Computation and Deduction (FSCD 2020)*, 28:1–28:22, 2020.
8. Frank Emrich, Sam Lindley, Jan Stolarek, James Cheney, and Jonathan Coates. FreezeML: Complete and easy type inference for first-class polymorphism. In *Proceedings of the 41st ACM SIGPLAN conference on Programming Language Design and Implementation (PLDI 2020)*, 2020.
9. Rudi Horn, Simon Fowler and James Cheney. Language-integrated updatable views. In *Proceedings of the 31st symposium on Implementation and Application of Functional Languages (IFL 2019)*, 2019.
10. Sheung Chi Chan and James Cheney. Flexible graph matching and graph edit distance using answer set programming. *Proceedings of the 22nd International Symposium on Practical Aspects of Declarative Languages (PADL 2020)*, p. 20–36, 2020.
11. Sheung Chi Chan, James Cheney, Pramod Bhatotia, Thomas Pasquier, Ashish Gehani, Hassaan Irshad, Lucian Carata, and Margo Seltzer. ProvMark: A provenance expressiveness benchmarking system. In *20th ACM/IFIP International Middleware Conference (Middleware 2019)*, p.268–279, 2019.
12. Jan Stolarek and James Cheney. Verified self-explaining computation. In *Proceedings of the 13th International Conference on Mathematics of Program Construction (MPC 2019)*, p. 76–102, 2019.
13. Stefan Fehrenbach and James Cheney. Language-integrated provenance by trace analysis. In *Proceedings of the 17th ACM SIGPLAN International Symposium on Database Programming Language (DBPL 2019)*, p. 74–84, 2019.
14. Wilmer Ricciotti and James Cheney. Explicit auditing. *Proceedings of the 15th International Conference on Theoretical Aspects of Computing (ICTAC 2018)*, p. 376–395, 2018.
15. Rudi Horn, Roly Perera and James Cheney. Incremental relational lenses. *Proceedings of the 23rd International Conference on Functional Programming (ICFP 2018)*, PACM:PL 2(ICFP):74:1–74:30, 2018.
16. Wilmer Ricciotti and James Cheney. Strongly normalizing audited computation. *Proceedings of the 26th EACSL Annual Conference on Computer Science Logic (CSL 2017)*, p. 36:1–36:21, 2017.
17. Wilmer Ricciotti, Jan Stolarek, Roly Perera and James Cheney. Imperative functional programs that explain their work. *Proceedings of the 22nd International Conference on Functional Programming (ICFP 2017)*, PACM:PL 1(ICFP):14:1–14:28, 2017.
18. Weili Fu, Roly Perera, Paul Anderson and James Cheney.  $\mu$ Puppet: A declarative subset of the Puppet configuration language. *Proceedings of the 31st European Conference on Object-Oriented Programming (ECOOP 2017)*, p. 12:1–12:27, 2017.



19. Stefan Fehrenbach and James Cheney. Language-integrated provenance. *Proceedings of the 18th International Symposium on Principles and Practice of Declarative Programming (PPDP 2016)*, p. 214–227, 2016.
20. Roly Perera, Deepak Garg and James Cheney. Causally consistent dynamic slicing. *Proceedings of the 27th International Conference on Concurrency Theory (CONCUR 2016)*, p. 18:1–18:15, 2016.
21. James Cheney, Alberto Momigliano and Matteo Pessina. Advances in Property-Based Testing for  $\alpha$ Prolog. *Proceedings of the 10th International Conference on Tests and Proofs, TAP 2016*, p. 37–56, 2016.
22. Faris Abou-Saleh, James Cheney, Jeremy Gibbons, James McKinna, and Perdita Stevens. Notions of bidirectional computation and entangled state monads. *Proceedings of the 2015 International Conference on Mathematics of Program Construction (MPC 2015)*, p. 187–214, 2015.
23. Harry Halpin and James Cheney. Dynamic provenance for SPARQL Update. *Proceedings of the 2014 International Semantic Web Conference (ISWC 2014)*, p. 425–440, 2014.
24. James Cheney, Amal Ahmed and Umut A. Acar. Database queries that explain their work. *Proceedings of the 2014 ACM SIGPLAN Conference on Principles and Practice of Declarative Programming (PPDP 2014)*, p. 271–282, 2014.
25. James Cheney, Sam Lindley and Philip Wadler. Query shredding: efficient relational evaluation of queries over nested multisets. *Proceedings of the ACM SIGMOD 2014 Conference on Management of Data (SIGMOD 2014)*, pages 1027–1038, 2014.
26. James Cheney, Sam Lindley, Gabriel Radanne and Philip Wadler. Effective quotation: relating approaches to language-integrated query. *Proceedings of the ACM SIGPLAN 2014 Workshop on Partial Evaluation and Program Manipulation (PEPM 2014)*, pages 15–26, 2014.
27. James Cheney, Sam Lindley and Philip Wadler. A practical theory of language-integrated query. *Proceedings of the 18th International Conference on Functional Programming (ICFP 2013)*, pages 403–416, 2013.
28. Roly Perera, Umut A. Acar, James Cheney, and Paul Blain Levy. Functional programs that explain their work. *Proceedings of the 17th International Conference on Functional Programming (ICFP 2012)*, pages 365–376, 2012.
29. Umut Acar, Amal Ahmed, James Cheney, and Roly Perera. A core calculus for provenance. *Proceedings of the 1st Conference on Principles of Security and Trust (POST 2012)*, pages 410–429, 2012.
30. James Cheney and Christian Urban. Mechanizing the metatheory of mini-XQuery. *Proceedings of the 1st Conference on Certified Programs and Proofs (CPP 2011)*, pages 280–295, 2011.
31. James Cheney. A formal foundation for provenance security. *Proceedings of the 24th IEEE Computer Security Foundations Symposium (CSF 2011)*, pages 281–293, 2011.
32. James Cheney. Satisfiability algorithms for conjunctive queries over trees. *Proceedings of the 14th International Conference on Database Theory (ICDT 2011)*, pages 150–161, 2011.
33. Michael Benedikt and James Cheney. Destabilizers and independence of XML updates. *Proceedings of the VLDB Endowment (VLDB 2010)*, 3(1):906–917, 2010.
34. James Cheney, Stephen Chong, Nate Foster, Margo Seltzer, and Stijn Vansummeren. Provenance: a future history. In *Proceedings of Onward! 2009*, p. 957–964, 2009.
35. Michael Benedikt and James Cheney. Schema-based independence analysis for XML updates. *Proceedings of the VLDB Endowment (VLDB 2009)*, 2(1):61–72, 2009.
36. Michael Benedikt and James Cheney. Semantics, types and effects for XML updates. In *Proceedings of the International Symposium on Database Programming Languages (DBPL 2009)*, pages 1–17, 2009.
37. Robert I. McKay, Xuan Hoai Nguyen, James R. Cheney, MinHyeok Kim, Naoki Mori, and Tuan Hao Hoang. Estimating the distribution and propagation of genetic programming building blocks through tree compression. In *Proceedings of the 11th Annual conference on Genetic and Evolutionary Computation (GECCO 2009)*, pages 1011–1018, New York, NY, USA, 2009. ACM.

38. James Cheney. FLUX: FunctionaL Updates for XML. In *Proceedings of the 13th ACM SIGPLAN International Conference on Functional Programming (ICFP 2008)*, pages 3–14, 2008.
39. Christian Urban, James Cheney, and Stefan Berghofer. Mechanizing the metatheory of LF. In *Proceedings of the 23rd Annual IEEE Symposium on Logic in Computer Science (LICS 2008)*, pages 45–56, 2008.
40. James Cheney. Regular expression subtyping for XML query and update languages. In *Proceedings of the 17th European Symposium on Programming (ESOP 2008)*, number 4960 in LNCS, pages 32–46, 2008.
41. James Cheney, Amal Ahmed, and Umut A. Acar. Provenance as dependency analysis. In *Proceedings of the 11th International Symposium on Database Programming Languages (DBPL 2007)*, number 4797 in LNCS, pages 139–153, Vienna, Austria, September 2007. Springer-Verlag.
42. Loreto Bravo, James Cheney, and Irini Fundulaki. Repairing inconsistent XML write-access control policies. In *Proceedings of the 11th International Symposium on Database Programming Languages (DBPL 2007)*, number 4797 in LNCS, pages 98–112, Vienna, Austria, September 2007. Springer-Verlag.
43. James Cheney and Alberto Momigliano. Mechanized metatheory model-checking. In *Proceedings of the 9th ACM SIGPLAN international symposium on Principles and practice of declarative programming (PPDP 2007)*, pages 75–86, New York, NY, USA, 2007. ACM Press.
44. Peter Buneman, James Cheney, and Stijn Vansummeren. On the expressiveness of implicit provenance in query and update languages. In *International Conference on Database Theory (ICDT 2007)*, number 4353 in Lecture Notes in Computer Science, pages 209–223. Springer-Verlag, 2007.
45. James Cheney. The semantics of nominal logic programs. In *Proceedings of the 22nd International Conference on Logic Programming (ICLP 2006)*, number 4079 in LNCS, pages 361–375. Springer-Verlag, 2006.
46. Peter Buneman, Adriane P. Chapman, and James Cheney. Provenance management in curated databases. In *Proceedings of the 2006 SIGMOD Conference on Management of Data (SIGMOD 2006)*, pages 539–550, Chicago, IL, 2006. ACM Press. **2016 ACM SIGMOD Test-of-Time award.**
47. James Cheney. Tradeoffs in XML compression. In *Proceedings of the 2006 IEEE Data Compression Conference (DCC 2006)*, pages 392–401. IEEE Press, 2006.
48. James Cheney. Scrap your nameplate (functional pearl). In Benjamin Pierce, editor, *Proceedings of the 10th International Conference on Functional Programming (ICFP 2005)*, pages 180–191, Tallinn, Estonia, September 2005. ACM Press.
49. James Cheney. A simpler proof theory for nominal logic. In *Proceedings of the 2005 Conference on Foundations of Software Science and Computation Structures (FOSSACS 2005)*, number 3441 in LNCS, pages 379–394. Springer-Verlag, 2005.
50. Christian Urban and James Cheney. Avoiding equivariant unification. In *Proceedings of the 2005 Conference on Typed Lambda Calculus and Applications (TLCA 2005)*, number 3461 in LNCS, pages 74–89. Springer-Verlag, 2005.
51. James Cheney. Equivariant unification. In *Proceedings of the 2005 Conference on Rewriting Techniques and Applications (RTA 2005)*, number 3467 in LNCS, pages 74–89, 2005.
52. Murdoch J. Gabbay and James Cheney. A sequent calculus for nominal logic. In *Proceedings of the 19th Annual IEEE Symposium on Logic in Computer Science (LICS 2004)*, pages 139–148, Turku, Finland, 2004.
53. James Cheney. The complexity of equivariant unification. In *Proceedings of the 31st International Colloquium on Automata, Languages and Programming (ICALP 2004)*, volume 3142 of LNCS, pages 332–344. Springer-Verlag, 2004.
54. James Cheney and Christian Urban. Alpha-Prolog: A logic programming language with names, binding and alpha-equivalence. In *Proceedings of the 20th International Conference on Logic Programming (ICLP 2004)*, number 3132 in LNCS, pages 269–283. Springer-Verlag, 2004.
55. James Cheney and Ralf Hinze. A lightweight implementation of generics and dynamics. In *Proceedings of the 2002 ACM SIGPLAN workshop on Haskell (Haskell Workshop 2002)*, pages 90–104, 2002.

56. Dan Grossman, Greg Morrisett, Trevor Jim, Michael Hicks, Yanling Wang, and James Cheney. Region-based memory management in Cyclone. In *Proceedings of the 2002 ACM Conference on Programming Language Design and Implementation (PLDI 2002)*, pages 282–293, Berlin, Germany, June 2002. ACM Press.
57. Trevor Jim, Greg Morrisett, Dan Grossman, Michael Hicks, James Cheney, and Yanling Wang. Cyclone: A safe dialect of C. In *Proceedings of the USENIX Annual Technical Conference (USENIX 2002)*, pages 275–288, Monterey, CA, June 2002. USENIX.
58. James Cheney, Carl Lagoze, and Peter Botticelli. Toward a theory of information preservation. In P. Constantopolous and I. T. Sølvsberg, editors, *Proceedings of the 5th European Conference on Research and Advanced Technology for Digital Libraries (ECDL 2001)*, volume 2163 of *Lecture Notes in Computer Science*, pages 340–351, Darmstadt, Germany, September 2001. Springer-Verlag.
59. James Cheney. Compressing XML with multiplexed hierarchical models. In *Proceedings of the 2001 IEEE Data Compression Conference (DCC 2001)*, pages 163–172, Snowbird, UT, March 2001. IEEE Press.

### Workshop, demonstration, and short papers

1. Nils Weidmann, Anthony Anjorin and James Cheney. VICToRy: Visual Interactive Consistency Management in Tolerant Rule-based Systems. In *Proceedings of the Eleventh International Workshop on Graph Computation Models (GCM 2020)*, 2020.
2. Sheung Chi Chan, Ashish Gehani, Hassaan Irshad, and James Cheney. Integrity Checking and Abnormality Detection of Provenance Records. In *Proceedings of the 12th USENIX Workshop on Theory and Practice of Provenance (TaPP 2020)*, 2020.
3. Sándor Bartha and James Cheney. Towards meta-interpretive learning of programming language semantics (short paper). In *Proceedings of the 29th International Conference on Inductive Logic Programming*, p. 16-25, 2019.
4. Anthony Anjorin and James Cheney. Provenance meets bidirectional transformations (short paper). In *Proceedings of the 11th USENIX Workshop on Theory and Practice of Provenance (TaPP 2019)*, 2019.
5. Ghita Berrada and James Cheney. Aggregating unsupervised provenance anomaly detectors. In *Proceedings of the 11th USENIX Workshop on Theory and Practice of Provenance (TaPP 2019)*, 2019.
6. Wilmer Ricciotti and James Cheney. Mixing set and bag semantics (short paper). in *Proceedings of the 17th ACM SIGPLAN International Symposium on Database Programming Language (DBPL 2019)*, 2019.
7. Junao Wu, Arek Mikolajczak, and James Cheney. TryLinks: an interactive tutorial system for a cross-tier web programming language. In *Conference Companion of the 3rd International Conference on Art, Science, and Engineering of Programming (ProWeb 2019)*, 16:1-16:6.
8. Sheung Chi Chan, James Cheney, Ashish Gehani, Ripduman Sohan, and Hassaan Irshad. Expressiveness benchmarking for system-level provenance. In *Proceedings of the 9th USENIX Workshop on Theory and Practice of Provenance (TaPP 2017)*, 2017.
9. Rui Abreu, Dave Archer, Erin Chapman, Hoda Eldardiry, James Cheney, and Adria Gascon. Provenance segmentation. In *Proceedings of the 8th USENIX Workshop on Theory and Practice of Provenance (TaPP 2016)*, 2016.
10. Roly Perera and James Cheney. Proof-relevant  $\pi$ -calculus. In *Proceedings of the 10th International Workshop on Logical Frameworks and Metalanguages, Theory and Practice (LFMTP 2015)*, 46–70, 2015.
11. James Cheney, Jeremy Gibbons, James McKinna, and Perdita Stevens. Towards a principle of least surprise for bidirectional transformations. In *Proceedings of the Fourth International Workshop on Bidirectional Transformations (BX 2015)*, CEUR-WS 1396:66-80, 2015.
12. Stefan Fehrenbach and James Cheney. Language-integrated provenance in Links. In *Proceedings of the 7th USENIX Workshop on Theory and Practice of Provenance (TaPP 2015)*, 2015.
13. James Cheney and Roly Perera. An analytical survey of provenance sanitization. In *Proceedings of the 2014 International Provenance and Annotation Workshop (IPAW 2014)*, LNCS 8628, pages 113–126, 2014.

14. James Cheney, James McKinna, Perdita Stevens and Jeremy Gibbons. Towards a Repository of Bx Examples. In *Proceedings of the Third International Workshop on Bidirectional Transformations (BX 2014)*, pages 87–91, 2014.
15. James Cheney, James McKinna, Perdita Stevens, Jeremy Gibbons, Faris Abou-Saleh: Entangled State Monads. In *Proceedings of the Third International Workshop on Bidirectional Transformations (BX 2014)*, pages 108–111, 2014.
16. James Cheney, Umut A. Acar and Roly Perera. Towards a theory of self-explaining computation. In *search of elegance in the theory and practice of computation: a Festschrift in honour of Peter Buneman*, LNCS 8000, pages 193–216, 2013.
17. Eric Griffis, Paul Martin and James Cheney. Semantics and Provenance for Processing Element Composition in Dispel Workflows, WORKS 2013.
18. Alessandro Spinuso, James Cheney, Malcolm Atkinson. Provenance for seismological processing pipelines in a distributed streaming workflow. In *BigProv 2013*.
19. Raghu Rajkumar, Nate Foster, Sam Lindley, James Cheney: Lenses for Web Data. In *Proceedings of the Second International Workshop on Bidirectional Transformations (BX 2013)*, ECEASST 57, 2013.
20. James Cheney. Static Enforceability of XPath-Based access control policies. In *Proceedings of the 14th International Symposium on Database Programming Languages (DBPL 2013)*, available at <http://arxiv.org/abs/1309.1303>, 2013.
21. Paul Anderson and James Cheney. Toward provenance-based security for configuration languages. In *TAPP 2012*.
22. Peter Buneman, James Cheney, and Egor Kostylev. Hierarchical models of provenance. In *TAPP 2012*.
23. Sam Lindley and James Cheney. Row-based effect types for database integration. In *Proceedings of the 7th ACM SIGPLAN Workshop on Types in Language Design and Implementation (TLDI 2012)*, pages 91–102, ACM.
24. James Cheney, Sam Lindley and Heiko Mueller. Using Links to prototype a Database Wiki. In *Proceedings of the 2011 Symposium on Database Programming Languages*. Informal proceedings.
25. Harry Halpin and James Cheney. Dynamic provenance for SPARQL updates using named graphs. *Proceedings of the 3rd Workshop on the Theory and Practice of Provenance (TaPP 2011)*, USENIX, 2011.
26. Peter Buneman, James Cheney, Sam Lindley and Heiko Mueller. DBWiki: A Structured Wiki for Curated Data and Collaborative Data Management. In *Proceedings of the 2011 SIGMOD Conference on Management of Data (SIGMOD 2011)*, pages 1335–1338, ACM, 2011. Demonstration.
27. James Cheney. Causality and the semantics of provenance. In *Proceedings of the 6th Workshop on Developments in Computational Models: Causality, Computation and Physics (DCM)*, EPTCS volume 26, pages 63–74, 2010.
28. Umut A. Acar, Peter Buneman, James Cheney, Natalia Kwasnikowska, Stijn Vansummeren, and Jan van den Bussche. A graph model for data and workflow provenance. In *Proceedings of the 2nd Workshop on the Theory and Practice of Provenance (TaPP 2010)*, USENIX, 2010.
29. James Cheney. A simple nominal type theory. In *Logical Frameworks and Meta-Languages: Theory and Practice (LFMTP 2008)*, pages 90–104, 2008.
30. James Cheney and Morten Dahl. Resource bound analysis for database queries. In *Proceedings of the 2008 ACM SIGPLAN Workshop on Programming Languages and Security (PLAS)*, pages 67–78, 2008.
31. Loreto Bravo, James Cheney, and Irini Fundulaki. ACCOn: Checking consistency of XML write-access control policies. In *Proceedings of the 11th International Conference on Extending Database Technology (EDBT 2008)*, pages 715–719, 2008. Demonstration.
32. James Cheney. LUX: A lightweight, statically typed XML update language. In *ACM SIGPLAN Workshop on Programming Language Technology and XML (PLAN-X 2007)*, pages 25–36, 2007.

33. Peter Buneman, Adriane P. Chapman, James Cheney, and Stijn Vansummeren. A provenance model for manually curated data. In *International Provenance and Annotation Workshop (IPAW 2006)*, number 4145 in LNCS, pages 162–170. Springer-Verlag, 2006.
34. James Cheney. Towards a general theory of names, binding, and scope. In *Proceedings of the 2005 Workshop on Mechanizing Reasoning about Languages with Variable Binding (MERLIN 2005)*, pages 33–40, 2005.
35. James Cheney. Relating nominal and higher-order pattern unification. In *Proceedings of the 19th International Workshop on Unification (UNIF 2005)*, pages 104–119, 2005.
36. James Cheney. An empirical evaluation of simple DTD-conscious compression techniques. In *Proceedings of the Eighth Workshop on the Web and Databases (WebDB 2005)*, pages 43–48, 2005.
37. James Cheney and Christian Urban. System description: Alpha-Prolog, a fresh approach to logic programming modulo alpha-equivalence. In J. Levy, M. Kohlhase, J. Niehren, and M. Villaret, editors, *Proceedings of the 17th International Workshop on Unification (UNIF 2003)*, pages 15–19, Valencia, Spain, June 2003. Departamento de Sistemas Informaticos y Computacion, Universidad Politecnica de Valencia. Technical Report DSIC-II/12/03.