

KAUSTUV CHAUDHURI

CURRICULUM VITAE

1 CONTACT

Inria CR Saclay – Île-de-France
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2 EMPLOYMENT

1. Institut National de Recherche en Informatique et en Automatique (Inria), Saclay, France
Chargé de recherche (research scientist, 1st class), November 2009 – present (tenured)
2. Department of Computer Science, École Polytechnique, Palaiseau, France
Chargé d’enseignement (lecturer), April 2014 – present
3. Microsoft Research–Inria Joint Center, Orsay, France
Post-doctoral fellow, November 2007 – October 2009
4. Inria and LIX, École Polytechnique, Palaiseau, France
Post-doctoral fellow, November 2006 – October 2007
5. Carnegie Mellon University, Computer Science Dept., Pittsburgh, USA
Doctoral research, August 2000 – October 2006
6. Microsoft Research, Redmond, USA
Research internship, June 2004 – September 2004

3 EDUCATION

1. Ph.D. in Computer Science
Carnegie Mellon University, Pittsburgh, USA. December 2006
Thesis: *The Focused Inverse Method for Linear Logic*
Supervisor: Frank Pfenning
2. B.S. in Computer Science
Carnegie Mellon University, May 2000 (university honors)
3. B.S. in Mathematics (Discrete Math. & Logic track)
Carnegie Mellon University, May 2000 (university honors)

4 RESEARCH INTERESTS

- Automated deduction; proof theory; logic programming; logical frameworks
- Specification and reasoning in stateful, concurrent and distributed systems
- Symbolic, temporal, stochastic, and probabilistic reasoning; constrained process calculi; formal security

5 PUBLICATIONS

All papers may be downloaded from: <http://chaudhuri.info/research/papers/>

Refereed International Journals and Conferences

1. Kaustuv Chaudhuri and Giselle Reis. *An adequate compositional encoding of bigraph structure in linear logic with subexponentials*. Logic for Programming, Artificial Intelligence, and Reasoning (LPAR-20), Suva, Fiji. November 2015.
2. Taus Brock-Nannestad and Kaustuv Chaudhuri. *Disproving Using the Inverse Method by Iterated Refinement of Finite Approximations*. Automated Reasoning with Analytic Tableaux and Related Methods (TABLEAUX-24), Wrocław, Poland. Springer LNCS 9323, pp. 153–168. September 2015.
3. Yuting Wang and Kaustuv Chaudhuri. *A Proof-Theoretic Characterization of Independence in Type Theory*. International Conference on Typed Lambda Calculi and Applications (TLCA-13), Warsaw, Poland. LIPIcs v.38, pp. 332–346. July 2015.
4. Kaustuv Chaudhuri, Matteo Cimini, and Dale Miller. *A lightweight formalization of the meta-theory of bisimulation-up-to*. ACM-SIGPLAN Conference on Certified Programs and Proofs (CPP-4), Mumbai, India. ACM Proceedings, pp. 157–166. January 2015. See also <http://abella-prover.org/upto/>.
5. David Baelde, Kaustuv Chaudhuri, Andrew Gacek, Dale Miller, Gopalan Nadathur, Alwen Tiu, and Yuting Wang. *Abella: A System for Reasoning about Relational Specifications*. Journal of Formalized Reasoning. Volume 7(2). 2014.
6. Mary Southern and Kaustuv Chaudhuri. *A Two-Level Logic Approach to Reasoning about Typed Specification Languages*. International Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS-34), New Delhi, India. LIPIcs, v. 29, pp. 557–569. December 2014. See also <http://abella-prover.org/lf/>.
7. Olivier Savary-Bélanger and Kaustuv Chaudhuri. *Automatically Deriving Schematic Theorems for Dynamic Contexts*. Logical Frameworks and Meta-languages: Theory and Practice (LFMTP-9), Vienna, Austria. ACM Proceedings. July 2014.
8. Kaustuv Chaudhuri and Nicolas Guenot. *Equality and Fixpoints in the Calculus of Structures*. Joint meeting of the 23rd Computer Science Logic and the 29th Logic in Computer Science (CSL-LICS), Vienna, Austria (reviews). ACM Proceedings. July 2014.
9. Kaustuv Chaudhuri, Stefan Hetzl, and Dale Miller. *The Isomorphism Between Expansion Proofs and Multi-Focused Sequent Proofs*. Journal of Logic and Computation. Available online (advance access) from 2014. To appear in print. Oxford University Press
10. Joëlle Despeyroux and Kaustuv Chaudhuri, *A Hybrid Linear Logic for Constrained Transition Systems*, Types for Proofs and Programs, post-proceedings of TYPES 2013. LIPIcs v. 26, pp. 150–168. 2014.
11. Yuting Wang, Kaustuv Chaudhuri, Andrew Gacek, and Gopalan Nadathur, *Reasoning about Higher-Order Relational Specifications*, Symposium on Principles and Practice of Declarative Programming (PPDP-15), Madrid, Spain. ACM Proceedings, pp. 157–168. September 2013.
12. Kaustuv Chaudhuri, *Subformula Linking as an Interaction Method*. Conference on Interactive Theorem Proving (ITP-4), Rennes, France. Springer LNCS 7998, pp. 386–401. July 2013.
13. Kaustuv Chaudhuri, *Compact Proof Certificates for Linear Logic*. Certified Programs and Proofs (CPP-2), Kyoto, Japan. Springer LNCS 7679, pp. 208–223. December 2012.
14. Kaustuv Chaudhuri, Stefan Hetzl, and Dale Miller, *A Systematic Approach to Canonicity in the Classical Sequent Calculus*, EACSL Annual Conferences on Computer Science Logic (CSL-21), Fontainebleau, France. LIPIcs v. 16, pp. 183–197. September 2012.
15. Kaustuv Chaudhuri, Nicolas Guenot, and Lutz Straßburger, *The Focused Calculus of Structures*, EACSL Annual Conference on Computer Science Logic (CSL-20), Bergen, Norway. LIPIcs v. 13 pp. 159–173. September 2011.
16. Kaustuv Chaudhuri, *Magically Constraining the Inverse Method Using Dynamic Polarity Assignment*. International Conference on Logic for Programming, Artificial Intelligence, and Reasoning (LPAR-17), Yogyakarta, Indonesia. Springer LNCS 6397, pp. 202–216. October 2010.
17. Kaustuv Chaudhuri, *Classical and Intuitionistic Subexponential Logics are Equally Expressive*. EACSL Annual Conference on Computer Science Logic (CSL-19), Brno, Czech Republic. Springer LNCS 6247, pp. 185–199, August 2010.
18. Kaustuv Chaudhuri, Damien Doligez, Leslie Lamport, and Stephan Merz, *Verifying Safety Properties With the TLA+ Proof System*. International Joint Conference on Automated Reasoning (IJCAR-5), Edinburgh, Scotland. Springer LNAI 6173, pp. 142–148, July 2010.
19. Kaustuv Chaudhuri, *Focusing Strategies in the Sequent Calculus of Synthetic Connectives*. Logic for Programming, Artificial Intelligence and Reasoning (LPAR-15), Doha, Qatar. Springer LNCS 5330, pp. 467–481. November 2008.
20. Kaustuv Chaudhuri, Dale Miller, and Alexis Saurin, *Canonical Sequent Proofs via Multi-Focusing*. IFIP International

- Conference on Theoretical Computer Science (TCS-5), Milan, Italy. IFIP 273, pp. 383–396. September 2008.
21. Kaustuv Chaudhuri, Frank Pfenning and Greg Price, *A Logical Characterization of Forward and Backward Chaining in the Inverse Method*. Journal of Automated Reasoning, 40(2–3), pp. 133–177. 2008.
 22. Kaustuv Chaudhuri, Frank Pfenning and Greg Price, *A Logical Characterization of Forward and Backward Chaining in the Inverse Method*. International Joint Conference on Automated Reasoning (IJCAR-3), Seattle, Washinton. Springer LNCS 4130, pp. 97–111. August 2006.
 23. Kaustuv Chaudhuri and Frank Pfenning, *Focusing the Inverse Method for Linear Logic*. Computer Science Logic (CSL-19), Oxford, UK. Springer LNCS 3634, pp. 200–215. August 2005.
 24. Kaustuv Chaudhuri and Frank Pfenning, *A Focusing Inverse Method Theorem Prover for First-Order Linear Logic*. Conference on Automated Deduction (CADE-20), Tallinn, Estonia. Springer LNCS 3632, pp. 69–83. July 2005.

International Workshops

25. Kaustuv Chaudhuri. *Undecidability of Multiplicative Subexponential Logic*. 3rd International Workshop on Linearity, Vienna, Austria, July 2014. Extended version available as *EPTCS*, v. 176, pp. 1–8, February 2015.
26. Joëlle Despeyroux and Kaustuv Chaudhuri, *A Hybrid Linear Logic for Constrained Transition Systems*. Types for Proofs and Programs (TYPES-19), Toulouse, France. April 2013.
27. Kaustuv Chaudhuri, Damien Doligez, Leslie Lamport and Stephan Merz, *A TLA+ Proof System*. Workshop on Knowledge Exchange: Automated Provers and Proof Assistants (KEAPPA). CEUR Workshop Proceedings 418, pp. 17–37. November 2008.

Theses and Technical Reports

28. Kaustuv Chaudhuri and Joëlle Despeyroux, *A Logic for Constrained Process Calculi with Applications to Molecular Biology*. Inria. Technical Report. May 2009.
29. Kaustuv Chaudhuri, *The Focused Inverse Method for Linear Logic*. Carnegie Mellon University. Ph.D. thesis, available as technical report CMU-CS-06-162. December 2006.
30. Kaustuv Chaudhuri and Frank Pfenning, *Focusing the Inverse Method for Linear Logic*. Carnegie Mellon University. Technical Report CMU-CS-05-106. July 2005.
31. Kaustuv Chaudhuri, *The Inverse Method for Intuitionistic Linear Logic (The Propositional Fragment)*. Carnegie Mellon University. Technical Report CMU-CS-03-140. November 2003.
32. Bor-Yuh Evan Chang, Kaustuv Chaudhuri, and Frank Pfenning, *A Judgemental Analysis of Linear Logic*. Carnegie Mellon University. Technical Report CMU-CS-03-131R. April 2003.

Miscellaneous

33. Iliano Cervesato and Kaustuv Chaudhuri (editors). *Proceedings of the 10th International Workshop on Logical Frameworks and Meta-Languages: Theory and Practice (LFMTP)*. EPTCS v.185. August 2015.
34. Kaustuv Chaudhuri, Damien Doligez, Leslie Lamport, and Stephan Merz, *The TLA+ Proof System: Building a Heterogeneous Verification Platform*. Invited paper to the International Colloquium on Theoretical Aspects of Computing (ICTAC-7), Natal, Rio Grande do Norte, Brazil. Springer LNCS 6256, p. 44. September 2010.
35. Kaustuv Chaudhuri, *Polarities in Theorem Proving and Logic Programming*. Association of Logic Programming. Newsletter. May 2007.

6 RESEARCH GRANTS

- Inria Equipe Associée “RAPT”, 2011-2013 (principal investigator)
- CPCFQ project “Promis”, 2010-2015 (partner member)
- ANR Blanc “STRUCTURAL”, 2011-2013 (partner member)
- ARC “Eternal”, 2010-2012 (partner member)

7 ACADEMIC SERVICE

- 2015: Program Committee member of the *1st International Workshop on Focusing*, Suva, Fiji
- 2015: Program Committee member of the *10th International Workshop on Fixed Points in Computer Science (FICS)*, Berlin, Germany
- 2015: Program Committee co-chair of the *International Workshop on Logical Frameworks and Meta-languages: Theory and Practice (LFMTP)*, Berlin, Germany
- 2014–2015: Program Committee member of the *4th ACM-SIGPLAN Conference on Certified Programs and Proofs*, Mumbai, India
- 2014: Program Committee member of the *9th International Workshop on Logical Frameworks and Meta-languages: Theory and Practice (LFMTP)*, Vienna, Austria.
- 2014: Program Committee member of the *Third International Workshop on Linearity*, Vienna Australia
- 2014: Co-chair of the *Third International Workshop on Structures and Deduction (SD)*, Vienna, Austria
- 2014: Program Committee member of the *30th International Conference on Logic Programming (ICLP)*, Vienna Austria
- 2013–2014: Publicity Chair for CSL-LICS 2014 (conference), Vienna, Austria
- 2013: Co-organizer of the *LIX Colloquium 2013: Theory and Application of Formal Proofs*, École Polytechnique, Palaiseau, France.
- 2012: Co-organizer of *Collegium Logicum 2012* (workshop), Paris, France.
- 2011: Co-organizer of *STRUCTURAL 2011* (workshop), Innsbruck, Austria

8 SUPERVISION AND MENTORING

- Hernán Vanzetto, Ph.D. defended at the University of Lorraine, December 2014
Co-supervised with Stephan Merz.
- Yuting Wang (Ph.D.), intern, summer 2012, 2014
- Mary Southern (Ph.D.), intern, summer 2014
- Olivier Savary-Bélanger (masters), intern, summer 2013
- Chris Martens (Ph.D.), intern, summer 2011
- Salil Joshi (Ph.D.), intern, summer 2011
- Andrew Cave (masters), intern, summer 2011
- Matteo Cimini, postdoc, 2013–2014
- Simon Zambrovski, postdoc/intern, summer 2008

9 TEACHING

- 2014 – INF 321 : Introduction to Programming Languages (École Polytechnique, France)
- 2015 – INF 431 : Parallel and Distributed Computation (École Polytechnique, France)
- June 2015 Tutorial Session on Relational Specifications in Abella at the 25th
Conference on Automated Deduction

10 SELECTED SYSTEMS AND SOFTWARE

- *Mætning*
A theorem prover for intuitionistic first-order logic that is designed to disprove non-theorems using sophisticated saturation techniques. Released under a BSD-style license.
<https://github.com/chaudhuri/maetning>

- *Abella*
An interactive theorem prover for reasoning about higher-order abstract syntax and for specifying and verifying the properties of higher-order logic programs. Released under the GPL.
<http://abella-prover.org>
- The *Proof Manager* for the *TLA+ Proof System (TLAPS)*
A proof development framework for the TLA+ specification language.
Written in OCaml. Released under a BSD-style license.
<http://tla.msr-inria.inria.fr/tlaps>
- *Linprover*
A certifying focused inverse method theorem prover for first-order intuitionistic linear logic
Written in Standard ML. Released under the GPL 2.0.
<http://chaudhuri.info/software/linprover>
- *Profound* (alpha release)
An interactive theorem prover based on the formula-linking approach.
Written in OCaml. Released under a MIT-style license.
<http://chaudhuri.info/software/profound>

11 INSTITUTIONAL RESPONSIBILITIES

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| 2009 – 2012 | Member, Committee for Technological Development
Inria Saclay, France |
| 2013 – 2014 | Scientific Review Panel, LIX-Qualcomm-Carnot PostDoc Selection Committee
École Polytechnique, France |

12 PERSONAL INFORMATION

- U.S. citizen; Indian overseas citizen; *Titre de résident* (long term resident), France.
- Languages: English (native), Bengali (native), Hindi, French (intermediate), Japanese (basic)