Michaël Cadilhac

Contact Information

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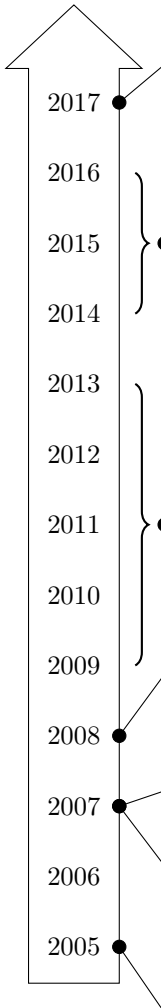
Research Interests

Automata theory, circuit complexity, formal logic, in relation with algebraic language theory, computational complexity, computability, model-checking

Research Background



University of Oxford, Oxford, UK

Postdoctoral researcher, current position since March 2017

- Topics: *algebraic theory of transducers [5], counting in descriptive complexity [6]*

Universität Tübingen, Tübingen, Germany

Postdoctoral researcher, February 2014–February 2017

- Topics: *algebraic theory of transducers [8], language-theoretic views of descriptive complexity [12], cost register automata [18], extreme uniformity in circuit complexity [10]*

Université de Montréal, Montréal, QC, Canada

Ph.D., Computer Science and Operations Research, March 2013

- Thesis topic: *Automata with a semilinear constraint* [20]
- Area of study: automata theory
- Advisers: Prof. Pierre McKenzie, Prof. Alain Finkel (@ ENS Cachan)

Research assistant, March–December 2008

- Task: Mathematica programming to test conjectures on Steiner systems
- Supervisor: Prof. Pierre McKenzie

Université Paris Diderot, Paris, France

M.Sc., Mathematical Logic and Theoretical Computer Science, July 2007

- Thesis topic: *Uniform guided random walks for conformance testing* [25]
- Area of study: model-checking
- Advisers: Ass. Prof. Fatiha Zaidi (@ LRI)

École pour l'Informatique et les Techniques Avancées, Paris, France

Engineer's degree, Scientific Computing and Image Processing, July 2007

- Main project: Vaucanson, a C++ library for weighted automata
- Areas of study: automata theory, generic programming
- Supervisors: Prof. Jacques Sakarovitch (@ Télécom ParisTech), Dr. Akim Demaille

B.S., July 2005

- Thesis topic: *Comparative study of thread usage in fault-tolerant message passing* [27]
- Area of study: grid computing
- Advisers: Ass. Prof. Thomas Hérault (@ LRI)

Teaching Experience

University of Oxford, Oxford, UK

Winter 2018 — T.A. for *Computer Architecture*
Topics: Low-level C programming, assembly, processor design

Autumn 2017 — Tutor for *Computability Theory* (@ St Catherine's College)
Topics: Recursive functions, Turing machines, incompleteness theorems, randomness

Summer 2017 — T.A. for *Computer Architecture*

Universität Tübingen, Tübingen, Germany

Winter 2016 — Organizer for *Seminar on advanced automata theory*
Topics: Recent research topics in automata theory

Summer 2015 — Lecturer for *Second course in formal language theory*
Topics: Logics on words, abstract families, bounded languages, rational sets

Winter 2014 — Lecturer for *Special chapters in theoretical computer science*
Topic: From power series to linear recurrence sequences: advances on Skolem's problem

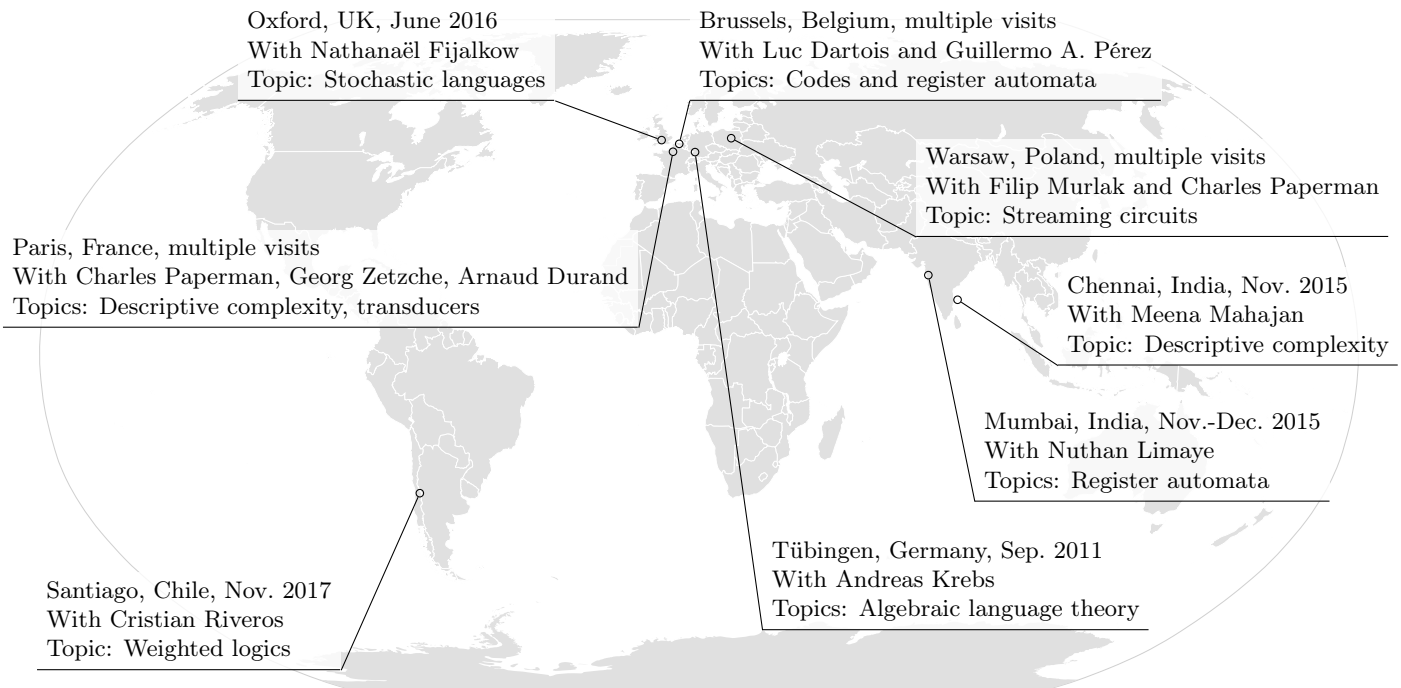
Université de Montréal, Montréal, QC, Canada

Summer 2011 — T.A. for *Introduction to theoretical computer science*
Winter 2011 — T.A. for *Introduction to theoretical computer science*
Summer 2010 — T.A. for *Introduction to theoretical computer science*
Summer 2009 — T.A. for *Introduction to theoretical computer science*
Topics: Finite automata, grammars, Turing machines, decidability, NP-completeness

École pour l'Informatique et les Techniques Avancées, Paris, France

Autumn 2006 — Lecturer for a crash course on computer architecture
Autumn 2006 — T.A. for *C/Unix programming classes*
Winter 2005 — T.A. for *M6800 assembly classes*

Research Visits



Para-Academic Duties

University of Oxford, Oxford, UK

2017 – 2019 — Coorganizer of the weekly *Verification Seminar*

2017 – 2019 — Representative for the CS Dept. at the *Research Staff Society*

2017 – 2019 — Social events committee member at the *Research Staff Society*

Université de Montréal, Montréal, QC, Canada

2011 – 2013 — PhD students representative at the *CS Student Council*

2009 – 2011 — Graduate social events organizer at the *CS Student Council*

École pour l'Informatique et les Techniques Avancées, Paris, France

2006 – 2007 — In charge of the badminton club

Nonacademic duties

Beer homebrewing

2017 – 2018 — Organizer of termly competitions for the *Oxford Brewers Group*

2014 – 2017 — Cofounder of the *Hobbybrauer Club Tübingen*

List of publications

Journal Publications

[1] Michaël Cadilhac, Andreas Krebs, and Pierre McKenzie. "The Algebraic Theory of Parikh Automata". In: *Theory Comput. Syst.* 62.5 (2018), pp. 1241–1268. DOI: 10.1007/s00224-017-9817-2.

[2] Michaël Cadilhac, Alain Finkel, and Pierre McKenzie. "Unambiguous constrained Automata". In: *Int. J. Found. Comput. Sci.* 24.7 (2013), pp. 1099–1116. DOI: 10.1142/S0129054113400339.

[3] Michaël Cadilhac, Alain Finkel, and Pierre McKenzie. "Bounded Parikh Automata". In: *Int. J. Found. Comput. Sci.* 23.8 (2012), pp. 1691–1710. DOI: 10.1142/S0129054112400709.

[4] Michaël Cadilhac, Alain Finkel, and Pierre McKenzie. "Affine Parikh automata". In: *RAIRO - Theor. Inf. and Applic.* 46.4 (2012), pp. 511–545. DOI: 10.1051/ita/2012013.

Conference Publications

[5] Michaël Cadilhac, Olivier Carton, and Charles Paperman. "Continuity and Rational Functions". In: *44th International Colloquium on Automata, Languages, and Programming, ICALP 2017, July 10-14, 2017, Warsaw, Poland*. 2017, 115:1–115:14. DOI: 10.4230/LIPIcs.ICALP.2017.115.

[6] Michaël Cadilhac and Charles Paperman. "A crevice on the Crane Beach: Finite-degree predicates". In: *32nd Annual ACM/IEEE Symposium on Logic in Computer Science, LICS 2017, Reykjavik, Iceland, June 20-23, 2017*. 2017, pp. 1–9. DOI: 10.1109/LICS.2017.8005148.

[7] Michaël Cadilhac, Andreas Krebs, and Klaus-Jörn Lange. "A Language-Theoretical Approach to Descriptive Complexity". In: *Developments in Language Theory - 20th International Conference, DLT 2016, Montréal, Canada, July 25-28, 2016, Proceedings*. 2016, pp. 64–76. DOI: 10.1007/978-3-662-53132-7_6.

[8] Michaël Cadilhac, Andreas Krebs, Michael Ludwig, and Charles Paperman. "A Circuit Complexity Approach to Transductions". In: *Mathematical Foundations of Computer Science 2015 - 40th International Symposium, MFCS 2015, Milan, Italy, August 24-28, 2015, Proceedings, Part I*. 2015, pp. 141–153. DOI: 10.1007/978-3-662-48057-1_11.

[9] Michaël Cadilhac, Andreas Krebs, and Nutan Limaye. "Value Automata with Filters". In: *Seventh Workshop on Non-Classical Models for Automata and Applications - NCMA 2015, Porto, Portugal, August 28-29, 2015. Short papers*. 2015, pp. 12–22.

[10] Michaël Cadilhac, Andreas Krebs, and Pierre McKenzie. "Extremely uniform branching programs". In: *Sixth Workshop on Non-Classical Models for Automata and Applications - NCMA 2014, Kassel, Germany, July 28-29, 2014. Proceedings*. 2014, pp. 73–83.

[11] Michaël Cadilhac, Andreas Krebs, and Pierre McKenzie. "The Algebraic Theory of Parikh Automata". In: *Algebraic Informatics - 5th International Conference, CAI 2013, Porquerolles, France, September 3-6, 2013. Proceedings*. 2013, pp. 60–73. DOI: 10.1007/978-3-642-40663-8_7.

[12] Michaël Cadilhac, Alain Finkel, and Pierre McKenzie. "Unambiguous Constrained Automata". In: *Developments in Language Theory - 16th International Conference, DLT 2012, Taipei, Taiwan, August 14-17, 2012. Proceedings*. 2012, pp. 239–250. DOI: 10.1007/978-3-642-31653-1_22.

[13] Michaël Cadilhac, Alain Finkel, and Pierre McKenzie. "On the Expressiveness of Parikh Automata and Related Models". In: *Third Workshop on Non-Classical Models for Automata and Applications - NCMA 2011, Milan, Italy, July 18 - July 19, 2011. Proceedings*. 2011, pp. 103–119.

[14] Michaël Cadilhac, Alain Finkel, and Pierre McKenzie. "Bounded Parikh Automata". In: *Proceedings 8th International Conference Words 2011, Prague, Czech Republic, 12-16th September 2011*. 2011, pp. 93–102. DOI: 10.4204/EPTCS.63.13.

[15] Michaël Cadilhac, Thomas Hérault, Richard Lassaigne, Sylvain Peyronnet, and Sébastien Tixeuil. "Evaluating Complex MAC Protocols for Sensor Networks with APMC". In: *Proceedings of the 6th International Workshop on Automated Verification of Critical Systems*. Vol. 185. Electr. Notes Theor. Comput. Sci. 2007, pp. 33–46.

[16] Michaël Cadilhac, Thomas Hérault, and Pierre Lemarinier. "Message Relaying Techniques for Computational Grids and their Relations to Fault Tolerant Message Passing for the Grid". In: *Proceedings of the 2nd CoreGRID Workshop on GRID and Peer to Peer Systems Architecture (D.SA.02)*. 2005, pp. 43–63.

Other Writings

[17] Michaël Cadilhac. "Review of: The Golden Ratio and Fibonacci Numbers by Richard A. Dunlap". In: *SIGACT News* 47.4 (2016), pp. 15–17. DOI: 10.1145/3023855.3023861.

[18] Michaël Cadilhac, Andreas Krebs, and Nutan Limaye. "Value Automata with Filters". In: *CoRR* abs/1510.02393 (2015). arXiv: 1510.02393.

[19] Michaël Cadilhac. "Review of graph structure and monadic second-order logic: a language-theoretic approach by Bruno Courcelle and Joost Engelfriet". In: *SIGACT News* 45.3 (2014), pp. 24–25. DOI: 10.1145/2670418.2670426.

[20] Michaël Cadilhac. "Automata with a semilinear constraint". PhD thesis. 2013.

[21] Michaël Cadilhac. "Review of proofs and algorithms by Gilles Dowek (translation by Maribel Fernandez)". In: *SIGACT News* 44.4 (2013), pp. 35–37. DOI: 10.1145/2556663.2556670.

[22] Michaël Cadilhac. "Review of handbook of weighted automata, edited by Manfred Droste, Werner Kuich and Heiko Vogler". In: *SIGACT News* 43.3 (2012), pp. 32–37. DOI: 10.1145/2421096.2421103.

[23] Michaël Cadilhac. "Review of combinatorics: a guided tour by David R. Mazur". In: *SIGACT News* 42.3 (2011), pp. 34–36. DOI: 10.1145/2034575.2034583.

[24] Sebastiaan Terwijn. *Éléments de théorie de la calculabilité*. French translation of *Syllabus Computability Theory* by Michaël Cadilhac. 2008.

[25] Michaël Cadilhac. *Uniform guided random walks for conformance testing*. Master 2 and ÉPITA report. 2007.

[26] Michaël Cadilhac. *Cover automata for finite languages, a survey*. Tech. rep. LRDE seminar, Paris, France, 2005.

[27] Michaël Cadilhac. *Comparative study of programming methods regarding threads in fault-tolerant message passing*. Bachelor's degree report. 2005.