

Emmanuel Filiot – FNRS Research Associate

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Personal

31 yo, born on March 18, 1982.

French Citizen.

1 Education

2008 (October 13) Ph.D. in Computer Science. INRIA Lille (France).

Title: *Logics for n-ary queries in trees.*

Committee:

Ms Laurence Duchien	Professor, USTL
Mr Giorgio Ghelli	Professeur, Pisa University
Mr Christof Löding	Assistant Professor, RWTH Aachen
Mr Luc Segoufin	Full-time researcher, INRIA, LSV Cachan
Mr Jean-François Raskin	Professor, Université Libre de Bruxelles
Ms Sophie Tison	Professor, Lille 1 University (Advisor)
Mr Jean-Marc Talbot	Professor, Université de Provence, Marseille (Advisor)

2005 Master's Degree in Computer Science (French Magistère), with honours. École Normale Supérieure de Lyon (last year at Lille University) .

2 Employment

Sep 2013 - now: FNRS¹ Research associate (“Chercheur Qualifié”), Université Libre de Bruxelles, Computer Science Department.

Sep 2012 - Aug 2013: Assistant professor at Université Paris-Est Créteil (Paris 12) in LACL lab (Algorithms, Complexity and Logic).

Oct 2010-Aug 2012: FNRS Post doctoral FNRS researcher (*Chargé de recherche*). Université Libre de Bruxelles (ULB). MOVE Team.

Oct 2008-Sep 2010: Post doctoral researcher. European Project [GASICS](#) (Games for Analysis and Synthesis of Interactive Computational Systems). Université Libre de Bruxelles (ULB).

Oct 2005-Sep 2008: Ph.D., INRIA Lille (Funded by INRIA and Région Nord-Pas de Calais), France.

¹FNRS: Fonds de la Recherche Scientifique, *The Fund for Scientific Research*

3 Research Stays and Grants

Research Stays

2011, 3 months (October-December) University of Pennsylvania. CS Department. Visit to Professor Rajeev Alur.

2009-2010 visits to Université de Provence (LIF Marseille), 6 weeks (cumulated).

Research Grants

FNRS Grant for a 3 months visit to UPenn. 4k€

Research grant for a project on “Synthesis”. Université Paris-Est Créteil. 5k€.

CNRS PEPS grant for a joined project with 2 members of Labri (Bordeaux) and 2 members of LIF (Marseille). 18k€.

4 Research Activities

Research Interests

Hardware and Software Verification and Synthesis, Game Theory for Computational Systems, Logics and Automata for (in)Finite Words and Trees, Transducer Theory, XML and Relational Databases.

Ph.D. students

co-advisor of Rodica Bozianu (Université Libre de Bruxelles and Université Paris-Est Créteil), started in Sep 2013. Subject: *Efficient Algorithms for Synthesis under Imperfect Information*.

co-advisor of Frédéric Servais (ULB) from October 2008 to October 2011 (now in post-doc in Hasselt University with Frank Neven). Subject: *Visibly Pushdown Transducers*.

Refereed Journal Publications

1. *Exploiting Structure in LTL Synthesis*. Emmanuel Filiot, Naiyong Jin, Jean-François Raskin. To appear in *International Journal on Software Tools for Technology Transfer*. 2012.
2. *Antichains and Compositional Algorithms for LTL Synthesis*. Emmanuel Filiot, Naiyong Jin, Jean-François Raskin. In *Journal of Formal Method in System Design*. 39(3): 261-296. 2011. Invited long version of CAV’09 and ATVA’10 articles.
3. *Tree Automata with Global Constraints*. Emmanuel Filiot, Jean-Marc Talbot, Sophie Tison. In *International Journal of Foundations of Computer Science*. 21(4): 571-596. 2010. Invited long version of DLT’08 article.

Refereed Conference Publications

4. *From Two-Way to One-Way Finite State Transducers*. Emmanuel Filiot, Olivier Gauwin, Pierre-Alain Reynier and Frédéric Servais. In *ACM/IEEE Logics in Computer Science (LICS)*. 2013.

5. *Synthesis for LTL Mean-Payoff Objectives*. Aaron Bohy, Véronique Bruyère, Emmanuel Filiot, Jean-François Raskin. In *Tools and Algorithms for the Construction and Analysis of Systems (TACAS)*, Springer, 2013.
6. *Regular Transformations of Infinite Strings*. Rajeev Alur, Emmanuel Filiot and Ashutosh Trivedi. In *ACM/IEEE Logics in Computer Science (LICS)*. 2012.
7. *Acacia+, a tool for LTL synthesis*. Aaron Bohy, Véronique Bruyère, Emmanuel Filiot, Naiyong Jin, Jean-François Raskin. In *Computer Aided Verification (CAV)*, Springer, 2012.
8. *Quantitative Languages Defined by Functional Automata*. Emmanuel Filiot, Raffaella Gentilini and Jean-François Raskin. In *International Conference on Concurrency Theory (CONCUR)*, Springer, 2012.
9. *Visibly Pushdown Transducers with Look-Ahead*. Emmanuel Filiot and Frédéric Servais. In *38th International Conference on Current Trends in Theory and Practice of Computer Science (SOFSEM)*, Springer, 2012.
10. *Streamability of Nested Word Transductions*. Emmanuel Filiot, Olivier Gauwin, Pierre-Alain Reynier, Frédéric Servais. In *Foundations of Software Technology and Theoretical Computer Science (FSTTCS)*, 2011.
11. *Efficient Enumeration for Conjunctive Queries over X-underbar Structures*. Guillaume Bagan, Arnaud Durand, Emmanuel Filiot, Olivier Gauwin. In *Computer Science Logic (CSL)*, 2010.
12. *Properties of Visibly Pushdown Transducers*. Emmanuel Filiot, Jean-François Raskin, Pierre-Alain Reynier, Frédéric Servais, Jean-Marc Talbot. In *Mathematical Foundation of Computer Science (MFCS)*, 2010.
13. *Iterated Regret Minimization in Game Graphs*. Emmanuel Filiot, Tristan le Gall, Jean-François Raskin. In *Mathematical Foundation of Computer Science (MFCS)*, 2010.
14. *Compositional Algorithms for LTL Synthesis*. Emmanuel Filiot, Naiyong Jin, Jean-François Raskin. In *Symposium on Automated Technology for Verification and Analysis (ATVA)*, 2010.
15. *An antichain algorithm for LTL Realizability*. Emmanuel Filiot, Naiyong Jin, Jean-François Raskin. In *Computer Aided Verification (CAV)*. 2009.
16. *Tree automata with global constraints*. Emmanuel Filiot, Jean-Marc Talbot and Sophie Tison. In *International Conference on Developments in Language Theory (DLT)*. 2008, LNCS, Springer Verlag.
17. *Regular n-ary queries in trees and variable independence*. Emmanuel Filiot and Sophie Tison. In *IFIP International Conference on Theoretical Computer Science (IFIP TCS)*. 2008.
18. *Polynomial time fragments of XPath with variables*. Emmanuel Filiot, Joachim Niehren, Jean-Marc Talbot and Sophie Tison. In *Proceedings of the ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems (PODS)*. 2007. ACM press, pp. 205–214.
19. *Satisfiability of a spatial logic with tree variables*. Emmanuel Filiot, Jean-Marc Talbot and Sophie Tison. In *Proceedings of the EACSL Annual Conference on Computer Science Logic (CSL)*. 2007. LNCS, Springer Verlag, pp. 130–145.

Refereed Workshop Publications

20. *Querying Regular Sets of XML Documents*. Slawomir Staworko, Emmanuel Filiot and Jan Chomicki. In *International Workshop on Logic in Databases (LiD)*. 2008.
21. *Composing monadic queries in trees*. Emmanuel Filiot, Joachim Niehren, Jean-Marc Talbot and Sophie Tison. In *PLAN-X International Workshop*. 2006. BRICS, pp. 61–70.

Tools

22. *Acacia+*, a tool for LTL synthesis (C/Python). With Aaron Bohy (UMons), Véronique Bruyère (UMons) and Jean-François Raskin. Last release: November 2011. Still maintained.
23. *Acacia*, a tool for LTL synthesis (Perl). With Naiyong Jin and Jean-François Raskin. Last release: 2010. No longer maintained.
24. *Ranked and Unranked Tree Automata Libraries for OCaml*. Last release: 2003. No longer maintained.

Technical Reports

25. *On Functionality of Visibly Pushdown Transducers*. Emmanuel Filiot, Jean-François Raskin, Pierre-Alain Reynier, Frédéric Servais, et Jean-Marc Talbot. In *CoRR*, abs/1002.1443. 2010.
26. *Meet your expectations with guarantees: Beyond worst-case synthesis in quantitative games*. With Mickael Randour, Véronique Bruyère and Jean-François Raskin. In *CoRR*, abs/1309.5439. 2013. Submitted for publication.
27. *Doomsday Equilibria for Omega-Regular Games*. With Krishnendu Chatterjee, Laurent Doyen and Jean-François Raskin. <http://www.ulb.ac.be/di/ssd/filiot/doomsday.pdf>. Submitted for publication.

Thesis

28. *Logics for n-ary queries in trees*. PhD Thesis. 2008.
29. *Compositions de Requêtes Monadiques dans les Arbres* (Composing Monadic Queries in Trees). In French. Master Thesis. 2006.

Oral Communications

Logics and Automata for Words and Trees, Transducer Theory

- 2013 *From Two-Way to One-Way Finite State Transducers*. LIAFA seminar (Paris), conference **LICS'13** (New Orleans), conference *Highlights of Logics, Games and Automata* (Paris) and Dagstuhl seminar 13192 ("Tree Transducers and Formal Methods").
- 2012 *Quantitative Languages defined by Functional Automata*. ERC grant Workshop. Brussels.
- 2012 *Streamability of Nested Word Transductions*, Mons Days of Theoretical Computer Science, Belgium.
- 2011 *Visibly Pushdown Transducers*, University of Pennsylvania, Rajeev Alur's team seminar.
- 2011 *Streamability of Nested Word Transductions*, CFV Seminar, Brussels.
- 2008 *Polynomial-time fragments of XPath with Variables*: French ANR Project ENUM, Paris.
- 2008 *Regular n-ary queries and variable independence*: **IFIP TCS Conference** (Milano), INRIA Mostrare Seminar (Lille).
- 2008 *Tree Automata with Global Constraints*: **DLT Conference**, Kyoto.
- 2008 *TQL Logic*: CFV seminar, Brussels.
- 2007 *Satisfiability of a Spatial Logic with Tree Variables*: **CSL Conference** (Lausanne), INRIA Mostrare seminar (Lille), LIF seminar (Marseille), seminar at Paris 1.
- 2007 *Polynomial-time fragments of XPath with Variables*: **PODS Conference**, INRIA Mostrare seminar.

2006 *Composing Monadic Queries in Trees*: **PLAN-X Workshop**, Charleston (USA), INRIA Mostrare seminar, french ANR Project TraLaLA (XML Transformation Languages: logic and applications).

Synthesis of Reactive Systems and Games

2012 *Exploiting Structure in LTL Synthesis*. Seminar of LSV (ENS Cachan), LIF (Marseille), CRIL (Lens), LABRI (Bordeaux), LACL (Paris 12), Mefosyoma seminar (that gathers people working in software verification from ENS Cachan, Paris 12, Paris 7, Université d'Evry and Paris 6).

2011 *Antichains and Compositional Algorithms for LTL Synthesis*: CFV seminar, Brussels.

2010 *Compositional Algorithms for LTL Synthesis*: **ATVA Conference** (Singapore).

2010 *Iterated Regret Minimization in Game Graphs*: seminar at Université of Mons, ULB seminar (Brussels), meeting of the European project GASICS, **MFCS Conference**.

2009 *Towards Efficient Algorithms for LTL Synthesis*: FNRS Contact Day, Louvain-la-neuve, Belgium.

2009 *An Antichain Algorithm for LTL Realizability*: **Workshop GAMES** (Udine, Italy), **CAV Conference** (Grenoble), European Project Quasimodo (Brussels), European Project Gasics (Brussels), LIAFA seminar (Paris), INRIA Mostrare seminar (Lille), Annual Workshop of the ESF Networking Programme on Games for Design and Verification.

Misc

2013 *Invited to a Dagstuhl Seminar on Transducer Models and Theory* organized by Sebastian Maneth and Helmut Seidl.

2009 *Tutorial on Determinization of Büchi Automata*: ULB seminar (Brussels).

2008 *Extraction d'Information*: Journées Eurodoc/Info, Lille.

2008 *Tutorial on Logics for Querying Trees*: INRIA Mostrare seminar (Lille). With Olivier Gauwin, Slawomir Staworko, Jérôme Champavère, Édouard Gilbert.

2004 *Unranked tree automata representation for (k,l)-contextual tree languages*: Mini Workshop Tree Automata, K.U.Leuven.

5 Teaching Activities

Lecture (Total: 142h)

2012-2013 *Algorithms and Complexity*. Bachelor in Computer Science (third year). 36 hours. Université Paris-Est Créteil.

2012-2013 *Specification languages and Model-Checking*. Master in Computer Science (first year). 36 hours. Lecture on specification languages for hardware and software verification. Université Paris-Est Créteil.

2011-2012 / 2012-2013 *Foundations of Computer Science*. Bachelor of Computer Science (3rd year). 35 hours. Lecture on logics in computer science and undecidability. Université Libre de Bruxelles.

Exercices (Total: 242h)

- 2012-2013 *Algorithms and Complexity*. Bachelor in Computer Science (third year). 36 hours.
- 2012-2013 *Introduction to Algorithms*. Bachelor in Computer Science (second year). 18 hours.
- 2012-2013 *Specification languages*. Master in Computer Science (first year). 24 hours (50% on machines).
- 2010-2011 *Logic in Computer Science*. Université Libre de Bruxelles. Bachelor of Computer Science (3rd year). 22 hours (0% on machines). Lecturer: Jean-François Raskin.
- 2009-2010 *Logic in Computer Science*. Université Libre de Bruxelles. Bachelor of Computer Science (3rd year). 22 hours (0% on machines). Lecturer: Jean-François Raskin.
- 2006-2007 *Advanced Algorithmic and Complexity*. Lille 1 University. Master of CS (1st year). 28h (30% on machines). Lecturer: Sophie Tison.
- 2006-2007 *Data Mining*. Lille 1 University. Master of CS (1st year). 28h (30% on machines).
- 2005-2006 *Advanced Algorithmic and Complexity*. Lille 1 University. Master of CS (1st year). 28h (30% on machines). Lecturer: Sophie Tison.
- 2003-2004 *Introduction to Programming and Algorithms, with Maple*. Lycée La Martinière (Lyon). French “Classes Préparatoires PCSI”. 1st year. 32 hours (100% on machines).

6 Other Academic Activities

Program Committees

- 2013, October PC Member of the workshop TTATT’13: “Trends in Tree Automata and Transducers Theory”, Colocated with ATVA’13.

External Reviewer for Conferences

Conferences: ² RTA’07, FOSSACS’08, RTA’08, FOSSACS’09, CAV’09, RTA’09, RTA’10, STACS’10, FOSSACS’10, LATA’11, LICS’11, ACSD’11, TIME’11, TACAS’12, LATA’12, LATA’13, FOSSACS’13, LICS’13, DLT’13, CONCUR’13.

Reviewer for Journals

JSTTT (*International Journal on Software Tools for Technology Transfer*, 1 article in 2011), JCSS (*Journal of Computer and System Sciences*, 1 article in 2011), JAR (*Journal of Automated Reasoning*, 1 article in 2011), RAIRO, 2013 (*Theoretical Informatics and Applications*, LMCS (*Logical Methods in Computer Science*), 2013).

²RTA: *International Conference on Rewriting Techniques and Applications*; FOSSACS: *International Conference on Foundations of Software Science and Computation Structures*; CAV: *International Conference on Computer Aided Verification*; STACS: *International Symposium on Theoretical Aspects of Computer Science*; LATA: *International Conference on Language and Automata Theory and Applications*; LICS: *Annual IEEE Symposium on Logic in Computer Science*; ACSD: *International Conference on Application of Concurrency to System Design*; TACAS: *International Conference on Tools and Algorithms for the Construction and Analysis of Systems*; TIME: *International Symposium on Temporal Representation and Reasoning*;