CURRICULUM VITÆ

Personal Information

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DIPLOMAS

Ph.D. (2005):

- Ph.D. Thesis at the *Laboratoire d'Informatique de l'École Normale Supérieure*, *Analysis of mobile systems by Abstract Interpretation*, PhD advisor: Patrick COUSOT; defended in February 2005.

Master's Degree (2000):

- Master's Degree in Pure and Applied Mathematics and in Computer Science at the École Normale Supérieure, Major: Abstract Interpretation, Mention: 'very good'.

CURRENT PROFESSIONAL STATUS

Current position: Research Fellow (CR2), Oct 2008 – present
Institution: INRIA Paris-Rocquencourt, France

Education

- 2000-2004: PhD studies. Thesis at the *Laboratoire d'Informatique de l'École Normale Supérieure*, *Analysis of mobile systems by Abstract Interpretation*, PhD advisor: Patrick COUSOT. Defended in February 2005;
- 1997-2000: Master's Degree in Pure and Applied Mathematics and in Computer Science Major: Abstract Interpretation, Mention: 'very good';
- 1997-2001: École Normale Supérieure.

Professional Experience

- Oct 2008 - present: Research Fellow (CR2) at INRIA ;
- Oct 2007 - Sept 2008: Research Fellow at Harvard Medical School – static analysis of biological networks;
- Jun 2007 - Sept 2007: Developer and Systems Designer at Plectix Biosystems Inc., Cambridge, MA, USA (design and implementation of algorithms for trace minimization in biological networks);

- Jan 2005 - Dec 2007: Research Fellow at École Normale Supérieure – ASTRÉE project;
- Sept 2004 - Dec 2004: Research Fellow at École Polytechnique – ASTRÉE project;
- Sept 2001 - Aug 2004: Université Paris-Dauphine – teaching assistant during my graduate studies;
- Jan 1999 - Jan 2000: Laboratoire d'Informatique de l'École Polytechnique (Palaiseau, France) – intern (design and implementation of a static analyzer for the π-calculus);
- Sept 1997 - Aug 2001: École Normale Supérieure – civil servant (university student in the Grandes Écoles system).

Research visits and collaborations

- 2009, École Polytechnique Fédérale de Lausanne (Switzerland);
- 2009, Seoul National University (Korea);
- 2007, Microsoft Research Redmond (WA, USA);
- 2006-2009, Harvard Medical School (MA, USA);
- 2005, Università degli Studi di Verona (Italy).

Awards and distinction

- Best paper award of the *Sixth International Conference on Verification, Model Checking and Abstract Interpretation* (VMCAI'05);
- Laureate of the Long-term Junior Chair of Excellence "AbstractCell" (ANR, Dec 2009-Dec 2013).

Publications (see attached list)

- author of two publications in international peer-reviewed journals;
- coauthor of three publications in international peer-reviewed journals;
- author of eight publications and talks in international peer-reviewed symposia;
- coauthor of ten publications in international peer-reviewed symposia;
- coauthor of two book chapters.

Invited seminars

- In France: Semantics and Abstract Interpretation (ÉNS) ($\times$3), the students of the *Department of Computer Sciences* of the ÉNS, PPS (Paris VII) ($\times$4), LORIA (Nancy), VERIMAG (Grenoble) ($\times$2), the working group about concurrency (Paris VII) ($\times$7), LIAFA (Paris VII), LABRI (Bordeaux), CEA-LIST (Saclay);
- Outside France: Formal Methods Group (Verona, Italy), Microsoft Research (Redmond, WA, USA), Department of Systems Biology of Harvard Medical School ($\times$3) (Boston, MA, USA), Seoul National University (15 hours of lectures) (Seoul, South Korea), LANOS Working Group (EPFL, Lausanne, Switzerland), EPFL (Lausanne, Switzerland).

The video of my talk at Microsoft Research is available at the following URL:
`http://www.researchchannel.org/prog/displayevent.aspx?rID=19819&fID=4608`.

Ad hoc reviewing activity

- Reviewer for international conferences:

  PPDP'00, ESOP'00, ESOP'01, SAS'01, TACS'01, SAS'02, VMCAI'03, FOSSACS'03, ESOP'03, SAS'03, VMCAI'04, SAC'04, ESOP'04, SAS'04, CONCUR'04, VMCAI'05, CONCUR'05, SAS'05, APLAS'05, CC'06, PLDI'06, SAS'06, APLAS'06, ASIAN'06, VMCAI'07, POPL'07, ESOP'07, FOSSACS'07, SAS'07, CONCUR'07, CSMB'07, POPL'08, VMCAI'08, SAS'08, ICALP'08, MFPS'08, CONCUR'08, POPL'09, VMCAI'09, ESOP'09, PEPM'09, FOSSACS'09, MPFS'09, SAS'09, FMICS'09, SEFM'09, CompMod'09, POPL'10, VMCAI'10, ESOP'10.

- Reviewer for international journals:

  Transactions on Programming Languages 2001, 2006, 2007; Information and Computation 2001, 2005; Journal of Computer Science and Technology 2006; Journal of Software 2007; Journal of Computer Security 2007; Transactions of Computational Systems Biology 2008; Fundamenta Informaticæ 2009; Theoretical Computer Science 2009.

- Reviewer for the Microsoft Research European PhD Scholarship program 2006.

- External Reviewer for the National Science Foundation's Merit Review Process 2009.

Committees

- Member of the expert committee of *the National Foundation of Research in Aeronautic and Spacial Applications* (FNRAE);

- Programme committee member of the Workshop on Developments in Computational Models (DCM 2009).

- Cochair of the First Workshop on Static Analysis and Systems Biology (SASB 2010).

PhD Juries

- Jury member of Sylvain Pradalier's PhD (École Polytechnique, September 2009).

Teaching

- 2008-2009: Lectures (15 hours) for graduate students in Seoul National University invited by Kwangkeun Yi.

- 2000-2009: Lectures (between 3 and 9 hours/year) for the program "Parisian Master of Research in Computer Science" (MPRI) in the context of Patrick Cousot's course on Abstract Interpretation;

- 2006-2008: Lectures (2 hours/year) for the program "Parisian Master of Research in Computer Science" in the context of Vincent Danos, François Fages, and Vincent Schächter's course on Formal Bioinformatics;

- 2005-2006: Lectures (4 hours) for the program "Master of Computer Science" at the University of Verona in the context of Roberto Giacobazzi's course on Automatic System Analysis and Verification;

- 2005-2007: Problem sets and sections (120 hours/year) in computer science for the students of the 'lycée Louis Le Grand' (Paris) applying to École Normale Supérieure;

- 2001-2004: Problem sets and sections (64 hours/year) in computer science for the students in the second year of the 'université Paris-Dauphine';
- 1998-2001: Problem sets and sections (80 hours/year) in computer science for the students of the 'lycée Marcelin Berthelot' (Saint-Maur, France) applying to École Normale Supérieure.

The lectures in the MPRI on Abstract Interpretation in 2007-2008, at the University of Verona 2005-2006, and at Seoul National University were delivered in English; the other lectures were given in French.

Interests

- music: drums (13 years in the Music School, Jazz and Rock bands);
- sport: swimming (10 years in club), tennis (5 years in club).

LIST OF PUBLICATIONS

International journals with review committees

[1] Jérôme Feret, Vincent Danos, Jean Krivine, Russ Harmer, and Walter Fontana. – Internal coarse-graining of molecular systems. *Proceedings of National Academy of Sciences of the United States of America(PNAS)*, 6 pages, 2009.

[2] Vincent Danos, Jérôme Feret, Walter Fontana, Russ Harmer and Jean Krivine. – Rule-based modelling and model perturbation. *Transactions on Computational Systems Biology (2009)*, *LNCS*, N°5750, pp. 116–137. – Springer, 2009.

[3] Patrick Cousot, Radhia Cousot, Jérôme Feret, Laurent Mauborgne, Antoine Miné, and Xavier Rival. – Why does ASTRÉE scale up ? *Formal Methods in System Design.* – Springer, 2009.

[4] Jérôme Feret. – The arithmetic-geometric progression abstract domain. *Selected in the Sixth International Conference on Verification, Model Checking and Abstract Interpretation (VMCAI'05)*, 18 pages, to appear.

[5] Jérôme Feret. – Abstract interpretation of mobile systems. *Journal of Logic and Algebraic Programming, Special issue on The pi-calculus*, vol. 63, pp. 59–130,2005. – Elsevier Inc.

Book chapter

[6] Elaine Murphy, Vincent Danos, Jérôme Feret, Russell Harmer, and Jean Krivine. – Rule Based Modelling and Model Refinement, invited chapter. *In : Elements of Computational Systems Biology*, ed. by H. Lodhi and S. Muggleton. – Wiley Book Series on Bioinformatics, 2009.

[7] Bruno Blanchet, Patrick Cousot, Radhia Cousot, Jérôme Feret, Laurent Mauborgne, Antoine Miné, David Monniaux, and Xavier Rival. – Design and implementation of a special-purpose static program analyzer for safety-critical real-time embedded software, invited chapter. *In : The Essence of Computation: Complexity, Analysis, Transformation. Essays Dedicated to Neil D. Jones*, ed. by T. Mogensen, D. Schmidt, and I. Sudborough, *LNCS*, N°2566, pp. 85–108. – Springer, 2002.

International symposia with review committees

[8] Vincent Danos, Jérôme Feret, Walter Fontana, Russel Harmer, and Jean Krivine. – Investigation of a biological repair scheme. *In : the 9th Workshop on Membrane Computing WMC9. LNCS*, N°5391. – Springer 2009.

[9] Olivier Bouissou, Eric Conquet, Patrick Cousot, Radhia Cousot, Jérôme Feret, Khalil Ghorbal, Eric Goubault, David Lesens, Laurent Mauborgne, Antoine Miné, Sylvie Putot, Xavier Rival, and Michel Turin. – Space Software Validation using Abstract Interpretation. *In : the conference of DAta System In Aerospace (DASIA 2009). ESA*. 2009.

[10] Vincent Danos, Jérôme Feret, Walter Fontana, and Jean Krivine. – Abstract Interpretation of Reachable Complexes in Biological Signalling Networks. *In : the 9th International Conference on Verification, Model Checking and Abstract Interpretation (VMCAI 2008). LNCS*, N°4905. – Springer 2008.

[11] Vincent Danos, Jérôme Feret, Walter Fontana, Russel Harmer, and Jean Krivine. – Rule-based modelling, symmetries, refinements. *In : In Formal Modelling Systems Biology(FMSB 2008). LNBI*, N°5054. – Springer 2008.

[12] Vincent Danos, Jérôme Feret, Walter Fontana, Russel Harmer, and Jean Krivine. – Scalable Simulation of Cellular Signaling Networks, invited paper. *In : the 5th Asian Symposium on Programming Languages and Systems (APLAS 2007). LNCS*, N°4703, pp. 139–157. – Springer 2007.

[13] Jérôme Feret. – Reachability Analysis of Biological Signalling Pathways by Abstract Interpretation. *In : the International Conference of Computational Methods in Sciences and Engineering (ICCMSE 2007). American Institute of Physics Conference Proceedings*, N°963.(2), pp. 619–622. – American Institute of Physics 2007.

[14] Vincent Danos, Jérôme Feret, Walter Fontana, Russell Harmer, and Jean Krivine. – Rule-based modelling of cellular signalling, invited paper. *In : Proceedings of the 18th International Conference on Concurrency Theory (CONCUR 2007). LNCS*, N°4703, pp. 17–41. – Springer 2007.

[15] Patrick Cousot, Radhia Cousot, Jérôme Feret, Laurent Mauborgne, Antoine Miné, David Monniaux, and Xavier Rival. – Varieties of Static Analyzers: A Comparison with Astrée, invited paper. *In : Proccedings of the 1st International Symposium on Theoretical Aspects of Software Engineering (TASE 2007)*. pp. 3–20. – IEEE Computer Society Press 2007.

[16] Patrick Cousot, Radhia Cousot, Jérôme Feret, Laurent Mauborgne, Antoine Miné, David Monniaux, and Xavier Rival. – Combination of Abstractions in the Astrée Static Analyzer, invited paper. *In : Post-proceeding of the 11th Annual Asian Computing Science Conference (ASIAN 2006). LNCS*, N°4435– Springer 2007.

[17] Jérôme Feret. – The arithmetic-geometric progression abstract domain. *In : Proceedings of the Sixth International Conference on Verification, Model Checking and Abstract Interpretation (VMCAI 2005). LNCS*, N°3385, pp. 42–58. – Springer, 2005. Best paper award.

[18] Patrick Cousot, Radhia Cousot, Jérôme Feret, Laurent Mauborgne, Antoine Miné, David Monniaux, and Xavier Rival. – The Astrée analyzer. *In : Proceedings of the Eight European Symposium on Programming (ESOP 2005). LNCS*, N°3444, pp. 21–30. – Springer, 2005.

[19] Jérôme Feret. – Static analysis of digital filters. *In : Proceedings of the Seventh European Symposium on Programming (ESOP 2004). LNCS*, N°2986, pp. 33–48. – Springer, 2004.

[20] Bruno Blanchet, Patrick Cousot, Radhia Cousot, Jérôme Feret, Laurent Mauborgne, Antoine Miné, David Monniaux, and Xavier Rival. – A static analyzer for large safety-critical software. *In : Proceedings of the ACM SIGPLAN '2003 Conference on Programming Language Design and Implementation (PLDI 2003)*, San Diego, Californie, U.S.A., 7–14 juin 2003. pp. 196–207. – ACM Press.

[21] Jérôme Feret. – Dependency analysis of mobile systems. *In : Proceedings of the Fifth European Symposium on Programming (ESOP 2002). LNCS*, N°2305, pp. 314–330. – Springer, 2002.

[22] Jérôme Feret. – Abstract interpretation-based static analysis of mobile ambients. *In : Proceedings of the Eighth International Static Analysis Symposium (SAS 2001). LNCS*, N°2126, pp. 413–431. – Springer, 2001.

[23] Jérôme Feret. – Confidentiality analysis of mobile systems. *In : Proceedings of the Seventh International Static Analysis Symposium (SAS 2000). LNCS*, N°1824, pp. 135–154. – Springer, 2000.

[24] Jérôme Feret. – Occurrence counting analysis for the π-calculus. *In : Second workshop on GEometric and Topological methods in COncurrency theory (GETCO 2000). ENTCS*, vol. 39.2. – Elsevier Science Publishers, 2001.

Miscellaneous

[25] Jérôme Feret. – Static analysis of digital filters. – Selected for the special issue of the First International workshop on Numerical and Symbolic Abstract Domains (NSAD 2005), (52 pages).

PhD report

[26] Jérôme Feret. – *Analysis of Mobile Systems by Abstract Interpretation.* – PhD Thesis in Computer Science, École polytechnique, Feb 2005.

These publications are available online at the following address:

http://www.di.ens.fr/~feret/publications/