CURRICULUM VITÆ

Personal Information

Last Name: FERET
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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 (CR1)
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, then CR1 since Jan 2011) at INRIA;
- May 2011 - present: Consultant for AbsInt Angewandte Informatik GmbH, Saarbruecken, Germany;
- Oct 2007 - Feb 2010: Consultant for Plectix BioSystems Inc., Cambridge, MA, USA;
- 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

- 2011, University of Bologna (Italy);
- 2011, ETH Zürich (Switzerland);
- 2010, University of Cambridge (United Kingdom);
- 2009, École Polytechnique Fédérale de Lausanne (Switzerland);
- 2009, Seoul National University (Korea);
- 2007, Microsoft Research Redmond (WA, USA);
- 2006-2011, 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).
- Best paper award of *AIAA Infotech@Aerospace 2010* (AIAA'10);

Publications (see attached list)

- author of a publication in an international peer-reviewed journal;
- coauthor of five publications in international peer-reviewed journals;
- author of ten publications and talks in international peer-reviewed symposia;
- coauthor of seventeen publications in international peer-reviewed symposia;
- coauthor of two book chapters.

Invited talks in conferences and workshops

- 2011: Plenary invited speaker at the 18th International Static Analysis Symposium (SAS 2011), 14–16 Sept 2011, Venice, Italy.
- 2011: Plenary invited speaker at the 27th Conference on the Mathematical Foundations of Programming Semantics (MFPS 27), 25–28 May 2011, Pittsburg, USA.
- 2010: Plenary invited speaker at the 1st International Workshop on Interactions between Computer Science and Biology, 10 June 2010, Amsterdam, Netherlands.
- 2010: Special session invited speaker at the 26th Conference on the Mathematical Foundations of Programming Semantics (MFPS 26), 6–10 May 2010, Ottawa, Canada.

Invited seminars

- In France: Semantics and Abstract Interpretation (ÉNS) (×3), the students of the *Department of Computer Sciences* of the ÉNS, PPS (Paris VII) (×4), LORIA (Nancy), VERIMAG (Grenoble) (×2), the working group about concurrency (Paris VII) (×7), LIAFA (Paris VII), LABRI (Bordeaux), CEA-LIST (Saclay), DIMNP (Montpellier), IBISC (Evry), INSTITUT CURIE (Paris);
- Outside France: Formal Methods Group (Verona, Italy), Microsoft Research (Redmond, WA, USA), Department of Systems Biology of Harvard Medical School (×3) (Boston, MA, USA), Seoul National University (15 hours of lectures) (Seoul, South Korea), LANOS Working Group (EPFL, Lausanne, Switzerland), EPFL (Lausanne, Switzerland), Jena University (Jena, Germany), University of Cambridge (Cambridge, UK), Programming Methodology group at ETH Zürich (Zürich, Switzerland), Bison group at ETH Zürich (Zürich, Switzerland), University of Bologna (20 hours of lectures) (Bologna, Italy), Focus group at the University of Bologna (Bologna, Italy).

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, MFPS'09, SAS'09, FMICS'09, SEFM'09, CompMod'09, POPL'10, VMCAI'10, ESOP'10, CAV'10, CONCUR'10, SAS'10, VMCAI'11, ESOP'11, SAS'11, MFCS'11, VMCAI'12, VSTTE'12, ESOP'12, HSCC'12.

- Reviewer for international journals:

  Transactions on Programming Languages 2001, 2006, 2007; Information and Computation 2001, 2005, 2011; 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, 2010, 2011. Mathematical Structures in Computer Science 2011.

- External Reviewer for the Microsoft Research European PhD Scholarship program 2006, the National Science Foundation's Merit Review Process 2009 and the ANR-white program 2010.

Team activities

- Dec 2009 - present: coorganizer (with Jean KRIVINE) of the working group of computational biology at the "École normale supérieure".

Committees

- Member of the expert committee of *the National Foundation of Research in Aeronautic and Spacial Applications* (FNRAE 2008);
- Programme committee member of the Workshop on Developments in Computational Models (DCM 2009);
- Programme committee member of the *International Workshop on Interactions between Computer Science and Biology (CS2Bio 2010);*
- Cochair of the First Internatiobal Workshop on Static Analysis and Systems Biology (SASB 2010);
- Programme committee member of the Second *International Workshop on Interactions between Computer Science and Biology (CS2Bio 2011);*
- Cochair of the Second *International Workshop on Static Analysis and Systems Biology (SASB 2011)*;
- Programme committee member of the Ninth *International Conference on Computational Methods in Systems Biology (CMSB 2011);*
- Programme committee member of the Ninth *Asian Symposium on Programming Languages and Systems (APLAS 2011).*
- Programme committee member of The Fourth *International Conference on Bioinformatics, Biocomputational Systems and Biotechnologies (BIOTECHNO 2012).*
- Programme committee member of The *International Symposium on Foundations of Health Information Engineering and Systems (FHIES 2012) ;*
- Cochair of the Third *International Workshop on Static Analysis and Systems Biology (SASB 2012)*;
- External Reviewing Committee member of the Fortyth *ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (POPL 2013).* International Symposium on es arbitr

Editorial boards

- since 2011: Editorial board member of Frontiers in Genetics.

Recruiting committees

- 2011-2012: Committee member for the recrutment of an assistant professor at the University of Lille 1, May 2012.
- 2010-2011: Committee member for the recrutment of an assistant professor at the University of Lille 1, May 2011.

PhD Juries

- Jury member of Loïc Paulevé's PhD (École Centrale Nantes, Octobre 2011).
- Jury member of Sylvain Pradalier's PhD (École Polytechnique, September 2009).

Teaching

- 2010-2011 : Lectures (20 hours) for graduate students in the University of Bologna about abstract interpretation and its applications ;
- 2010-2011 : Lectures (8 hours) for master students at the École normale supérieure of Lyon on rule base modeling and application to biololecular networks ;
- 2009-2011: Lectures and practical sections (between 4 and 8 hours/year) for the progrem "Master to life sciences" (AIV) in the context of Vincent Danos' course on Computational Biology;
- 2000-2011: 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;
- 2008-2009: Lectures (15 hours) for graduate students in Seoul National University invited by Kwangkeun Yi, on abstract interpretation and its applications ;
- 2006-2009: 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 master AIV, in the MPRI on Abstract Interpretation in 2007-2008 and 2009-2011, at the University of Verona, at Seoul National University, at the École normale supérieure of Lyon, and in the University of Bologna 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, Thomas Henzinger, Heinz Koeppl, and Tatjana Petrov. – Lumpability abstractions of rule-based systems. *In : Theoretical Computer Science, special issue MeCBIC 2009-2010.* – Elsevier Inc, 2012. to appear.

[2] Eric J. Deeds, Jean Krivine, Jérôme Feret, Vincent Danos, and Walter Fontana. – Combinatorial complexity and compositional drift in protein interaction networks. *PLoS ONE*, in Press.

[3] Russ Harmer, Vincent Danos, Jérôme Feret, Jean Krivine, and Walter Fontana. – Intrinsic information carriers in combinatorial dynamical systems. *Chaos*, vol. 20.(3), 16 pages – American Institute of Physics, 2010.

[4] Jérôme Feret, Heinz Koeppl, and Tatjana Petrov. – Stochastic fragments: A framework for the exact reduction of the stochastic semantics of rule-based models. *International Journal of Software and Informatics*, 79 pages – to appear.

[5] 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)*, vol. 106.(16), 6 pages, 2009.

[6] 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.

[7] 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.

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

Book chapter

[9] Julien Bertrane, Patrick Cousot, Radhia Cousot, Jérôme Feret, Laurent Mauborgne, Antoine Miné, and Xavier Rival. – L'analyseur statique Astrée, invited chapter. *In : Utilisations industrielles des techniques formelles : interprétation abstraite*, éd. par J.-L. Boulanger. – Hermes Science - Lavoisier, 2010.

[10] Elaine Murphy, Vincent Danos, Jérôme Feret, Jean Krivine, and Russell Harmer. – Rule-based modelling and model refinement, invited chapter. *In : Elements of Computational Systems Biology*, éd. par H. Lodhi and S. Muggleton. – Wiley Book Series on Bioinformatics, 2009.

[11] 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*, éd. par T. Mogensen, D. Schmidt, and I. Sudborough, *LNCS*, n°2566, pp. 85–108. – Springer, 2002.

International symposia with review committees

[12] Ferdinanda Camporesi, and Jérôme Feret. – Formal reduction for rule-based models. *In :* *Post-proceedings of the Twenty-seventh Conference on the Mathematical Foundations of Programming Semantics, MFPS XXVII. ENTCS*, vol. 276, pp. 31–61. – Elsevier Science Publishers 2011.

[13] Jérôme Feret. – Formal model reduction. *In :* *Proceedings of the Eighteenth International Static Analysis Symposium (SAS 2011). LNCS*, n°6887, p. 6. – Springer, 2011.

[14] Daniel Kästner, Stephan Wilhelm, Stefana Nenova, Patrick Cousot, Radhia Cousot, Jérôme Feret, Laurent Mauborgne, Antoine Miné, and Xavier Rival. – Astrée: Proving the absence of runtime errors. *In :* *Proceedings of the Embedded Real Time Software and Systems (ERTS 2010).*

[15] Julien Bertrane, Patrick Cousot, Radhia Cousot, Jérôme Feret, Laurent Mauborgne, Antoine Miné, and Xavier Rival. Static Analysis and Verification of Aerospace Software by Abstract Interpretation. In *AIAA Infotech@Aerospace 2010*, Atlanta, Georgia, American Institute of Aeronautics and Astronautics, 20–22 April 2010. Prix du meilleur article.

[16] Ferdinanda Camporesi, Jérôme Feret, Heinz Koeppl, and Tatjana Petrov. – Combining model reductions. *In :* *Post-Proceedings of the Twenty-sixth Conference on the Mathematical Foundations of Programming Semantics, MFPS XXVI. ENTCS*, vol. 265, pp. 73–96. – Elsevier Science Publishers 2010.

[17] Jérôme Feret. – Fragements-based model reduction: some case studies. *In :* *Post-Proceedings of the First International Workshop on Interactions between Computer Science and Biology, CS2Bio 2010. ENTCS.* – Elsevier Science Publishers 2010.

[18] Vincent Danos, Jérôme Feret, Walter Fontana, Russel Harmer, and Jean Krivine. – Abstracting the differential semantics of rule-based models: exact and automated model reduction. *In :* *Proceedings of the Twenty-Fifth Annual IEEE Symposium on Logic in Computer Science, LICS '2010. IEEE*, pp. 362–381. – IEEE Computer Society Press 2010.

[19] Jérôme Feret, Thomas Henzinger, Heinz Koeppl, and Tatjana Petrov. – Lumpability abstractions of rule-based systems. *In :* *Proceedings of the 4th Workshop on Membrane Computing and Biologically Inspired Process Calculi (MeCBIC 2010). EPTCS* – Electronic Proceedings in Theoretical Computer Science.

[20] Ferdinanda Camporesi, Jérôme Feret, Heinz Koeppl, and Tatjana Petrov. – Automatic reduction of stochastic rules-based models in a nutshell. *In :* *Proceedings of the 8th International Conference of Numerical Analysis and Applied Mathematics (ICNAAM 2010). American Institute of Physics Conference Proceedings*, n°1281, pp. 1330–1334. – American Institute of Physics 2010.

[21] Julien Bertrane, Patrick Cousot, Rhadia Cousot, Jérôme Feret, Laurent Mauborgne, Antoine Miné, David Monniaux, and Xavier Rival. – Static analysis by abstract interpretation of embedded critical software. *In :* *Proceedings of the Third IEEE International Workshop UML and Formal Methods (UML&FM 2010). ACM SIGSOFT Software Engineering Notes (SEN) vol.36(1).* – ACM 2011.

[22] Vincent Danos, Jérôme Feret, Walter Fontana, Russel Harmer, and Jean Krivine. – Investigation of a biological repair scheme. *In :* *Proceedings of the 9th Workshop on Membrane Computing WMC9. LNCS*, n°5391, pp. 1–12. – Springer 2009.

[23] 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 :* *Proceedings of the conference of DAta System In Aerospace (DASIA 2009)*, vol. SP-669, pp. 1–7. *ESA*. 2009.

[24] Vincent Danos, Jérôme Feret, Walter Fontana, and Jean Krivine. – Abstract interpretation of reachable complexes in biological signalling networks. *In :* *Proceedings of the 9th International Conference on Verification, Model Checking and Abstract Interpretation (VMCAI 2008). LNCS*, n°4905, pp. 83–97. – Springer 2008.

[25] Vincent Danos, Jérôme Feret, Walter Fontana, Russel Harmer, and Jean Krivine. – Rule-based modelling, symmetries, refinements. *In : Proceedings of Formal Modelling Systems Biology (FMSB 2008). LNBI*, n°5054, pp. 103–122. – Springer 2008.

[26] Vincent Danos, Jérôme Feret, Walter Fontana, and Jean Krivine. – Scalable simulation of cellular signaling networks. *In : Proccedings of the 5th Asian Symposium on Programming Languages and Systems (APLAS 2007). LNCS*, n°4703, pp. 139–157. – Springer 2007.

[27] Jérôme Feret. – Reachability analysis of biological signalling pathways by abstract interpretation. *In : Proccedings of 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.

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

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

[30] Patrick Cousot, Radhia Cousot, Jérôme Feret, Laurent Mauborgne, Antoine Miné, David Monniaux, and Xavier Rival. – Combination of Abstractions in the Astrée Static Analyzer. *In : Post-proceeding of the 11th Annual Asian Computing Science Conference (ASIAN 2006). LNCS*, n°4435, pp. 1–24. – Springer 2007.

[31] 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. Prix du meilleur article.

[32] 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.

[33] 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.

[34] 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)*, pp. 196–207. – ACM Press.

[35] 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.

[36] 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.

[37] 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.

[38] 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.

Proceedings Editing

[39] Jérôme Feret andAndre Levchenko (Eds.). – Proceedings of the 1st International Workshop on Static Analysis and Systems Biology (SASB 2010). *Electonic Notes in Theoretical Computer Science*, vol. 272, – Elsevier Science

Miscellaneous

[40] Jérôme Feret. – The arithmetic-geometric progression abstract domain. *Selectionné pour le numéro spécial de : the Sixth International Conference on Verification, Model Checking and Abstract Interpretation (VMCAI'05)*, 18 pages, à paraître.

[41] Jérôme Feret. – Static analysis of digital filters. *Sélectionné pour le numéro spécial de : the First International workshop on Numerical and Symbolic Abstract Domains (NSAD 2005)*, 52 pages, à paraître.

PhD report

[42] Jérôme Feret. – *Analysis of Mobile Systems by Abstract Interpretation.* – PhD Thesis in Computer Science, École polytechnique, February 25th 2005.

These publications are available online at the following address:

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