

CURRICULUM VITÆ

Personal Information

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First Name: JÉRÔME

Gender: M

DIPLOMAS

Ph. D. (2005):

- Ph. D. Thesis at the *Laboratoire d'Informatique de l'École Normale Supérieure, Analysis of mobile systems by Abstract Interpretation*, Ph. D. 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, France

Education

- 2000-2004: Ph. D. studies. Thesis at the *Laboratoire d'Informatique de l'École Normale Supérieure, Analysis of mobile systems by Abstract Interpretation*, Ph. D. 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

- 2013, East China University and National University of Defense Technology (China);
- 2011, University of Bologna (Italy);
- 2011 - 2013, 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 - present, Harvard Medical School (MA, USA);
- 2005, Università degli Studi di Verona (Italy).

Awards and distinctions

- Best paper award of the *Sixth International Conference on Verification, Model Checking and Abstract Interpretation* (VMCAI’05);
- Best paper award of *AIAA Infotech@Aerospace 2010* (AIAA’10);

Projects coordination

- Site leader in the ITMO Cancer project “TGF β SysBio” (Jan 2016–Dec 2019), coordinated by Nathalie Théret (Rennes 1, France), 420 k€.
- Consultant in the DARPA programme “Communicating with Computers” (July 2015–Jan 2019) (Team “Active Context”, coordinated by Walter Fontana (Harvard Medical School))
- Principal investigator of the ANR project “AnaStaSec” (ANR, Jan 2015–Dec 2018, 756 k€);

- Site leader in the DARPA programme “Big Mecanisms”) (July 2014–Jan 2018) (Team “Executable Knowledge”, coordinated by Walter Fontana (Harvard Medical School), 2726 k\$);
- Coprincipal investigator (with Denis Thieffry) of the incitative action on automatic synthesis of qualitative models for intracellular signaling pathways from higher-level representation (ÉNS, Nov 2013–Oct 2014, 51 k€);
- Principal investigator of the Long-term Junior Chair of Excellence “AbstractCell” (ANR, Dec 2009–Dec 2013, 337 k€).

Publications

- author of one publication in an international peer-reviewed journal;
- coauthor of eleven publications in international peer-reviewed journals;
- author of eleven publications and talks in international peer-reviewed symposia;
- coauthor of thirty publications in international peer-reviewed symposia;
- coauthor of three book chapters.

Invited talks

INVITED TALKS IN INTERNATIONAL CONFERENCES

- 2012: Invited speaker at the Systems Biology Europe symposium (SBE 2012), October 16–17, 2012, Madrid, Spain.
- 2011: Plenary invited speaker at the 18th International Static Analysis Symposium (SAS 2011), Sept 14–16, 2011, Venice, Italy;
- 2011: Plenary invited speaker at the 27th Conference on the Mathematical Foundations of Programming Semantics (MFPS 27), May 25–28, 2011, Pittsburg, USA;
- 2010: Special session invited speaker at the 26th Conference on the Mathematical Foundations of Programming Semantics (MFPS 26), May 6–10, 2010, Ottawa, Canada.

INVITED TALKS IN WORKSHOPS

- 2016: Invited speaker at the workshop on *Verified Trustworthy Software Systems*, Apris 4-7 2016, Imperial College, London, UK.
- 2015: Short talk at the seminar *École normale supérieure - Institut Pasteur*, February 5 2015, École normale supérieure, France.
- 2015: Short talk at the workshop *Integrative Cell Models*, Lorentz center, January 26–30 2015, Leiden, the Netherland.
- 2014: Short talk at the seminar *Multiscale Spatial Computational Systems Biology*, November 23–28 2014, Dagstuhl, Germany.
- 2014: Invited speaker at the seminar *Next Generation Software Analysis Tools*, August 24–29 2014, Dagstuhl, Germany.
- 2014: Invited speaker at the workshop on *Logic and Systems Biology (LSB 2014)*, July 13 2014, Vienna, Austria.

- 2013: Invited speaker at the workshop on *Analysis and Verification of Dependable Cyber Physical Software* (AVDCPS 2013), November 23–24 2013, Changsha, China.
- 2013: Invited speaker at the seminar *Critical Systems*, Captronic-Pegase, October 1st, Aix-en-Provence, France.
- 2013: Invited speaker at the seminar In’Tech, *Validation formelle des systèmes industriels critiques*, April 18, Grenoble, France.
- 2013: Invited speaker at workshop on *Modelisation, Optimisation, and Static Analysis*, January 7–11, 2013, Luminy, France.
- 2012: Invited speaker at the workshop *Information Flow and its Applications*, August 26–31, 2012, Schloss Dagstuhl, Dagstuhl, Germany.
- 2012: Invited speaker at the workshop on *Formal Methods in Systems Biology* (AFMSB 2012), July 7–8, 2012, Berkeley, USA.
- 2012: Invited speaker at the Workshop on *Theory of Probabilistic Systems*, April 2–5, 2012, Bellairs Institute, Barbados.
- 2012: Invited speaker at the Workshop on *Systems Biology and Formal Methods* (SBFM 2012), March 29–30, 2012, New York, USA.
- 2010: Plenary invited speaker at the 1st International Workshop on *Interactions between Computer Science and Biology* (CS2Bio 2010), June 10, 2010, Amsterdam, Netherlands.
- 2010: Invited speaker at the Workshop on *Computational Modelling of Biological Systems*, March 15–19, 2010, Bellairs Institute, Barbados.

INVITED TALKS IN LAB-MEETINGS

- 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), Concurrency working group (Paris VII) (×7), LIAFA (Paris VII), LABRI (Bordeaux), CEA-LIST (Saclay), DIMNP (Montpellier), ANR SYNBIOTIC (Evry), INSTITUT CURIE (Paris), ANR BIOTEMPO (Paris) (×3), SYMBIOSE (Rennes), IRIT (Toulouse), DYLISS (Rennes), “la demi-heure de science” (INRIA Paris-Rocquencourt), General seminar of the computer science department of the École normale supérieure (Paris), PLUME (Lyon);

The video of my talk at “La demi-heure de science” is available on the following link:

http://www.canal-u.tv/video/inria/reduction_de_modeles_de_voies_de_signalisation_intracellulaire.17571,

the one at the general seminar of the computer science department of the École normale supérieure is available here:

<http://savoirs.ens.fr/expose.php?id=2223>.

- 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) (×2), Bison group at ETH Zürich (Zürich, Switzerland) (×3), University of Bologna (20 hours of lectures) (Bologna, Italy), Focus group at the University of Bologna (Bologna, Italy), IMDEA (Madrid, Spain).

Research organization

ORGANIZATION OF INTERNATIONAL SCIENTIFIC EVENTS

- Cochair of the programme committee of an international symposium: CMSB 2017.
- Cochair of the programme committees of five international workshops: SASB 2010–2013, SBFM 2012.

PARTICIPATION TO COMMITTEES

- Member of the expert committee of the *National Foundation of Research in Aeronautic and Spacial Applications* (FNRAE 2008);
- Member of the programme committees of sixteen international workshops and twenty international conferences:
APLAS 2011; BIOTECHNO 2012–2016; CMSB 2011, 2013, 2016, 2018; CompMod 2013; CS2Bio 2010–2011; DCM 2009,2014–2015; FHIES 2012; FMICS 2014; ICBEB 2013–2014; JOBIM 2017; LICS 2018; LOPSTR 2015-2016; SAS 2016, 2018; SASB 2014-2018; IFIP TCS 2014; TMPA 2017; VEMDP 2014,2015,2018; VMCAI 2014.
- External Reviewing Committee member of the *Fortieth ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages* (POPL 2013);

EDITORIAL BOARDS

- since 2013: Editorial board member of Open Journal of Modelling and Simulation;
- since 2011: Editorial board member of Frontiers in Genetics.

AD HOC REVIEWING ACTIVITY

- Reviewer for 77 international conferences or international workshops:
APLAS 2005–2006, 2015; ASIAN 2006; CAV 2010,2015; CC 2006; CMSB 2007, 2012; CompMod 2009; CONCUR 2004–2005, 2007–2008, 2010, 2015-2017; ECOOP 2013; EMSOFT 2015; ESOP 2000–2004, 2007, 2009–2013; FMICS 2009; FOSSACS 2003, 2007, 2009, 2015; HSCC 2012–2013; ICALP 2008, 2013, 2016; LICS 2016–2017; MFCS 2011; MFPS 2008, 2009; PEPM 2009; PLDI 2006; POPL 2007–2010, 2015; PPDP 2000; SAC 2004; SAS 2001–2011; SEFM 2009; TACS 2001; VMCAI 2003–2005, 2007–2013, 2016–2017; VSTTE 2012.
- Reviewer for international journals:
Axioms 2014; BMC Systems Biology 2014; Formal Aspects of Computing 2013; Formal Methods in System Design 2017; Fundamenta Informaticæ 2009; Information and Computation 2001, 2005, 2011, 2015; Journal on Applied Dynamical System 2018; Journal of Computer Science and Technology 2006; Journal of Computer Security 2007; Journal of Software 2007; Logical Methods in Computer Science 2012; Mathematical Structures in Computer Science 2011; Natural Computing 2018; PLOS Computational Biology; Science of Computer Programming 2015; Software: Practice and Experience 2014; Theoretical Computer Science 2009, 2010, 2011, 2012, 2013, 2015, 2016, 2017; Theory and Practice of Logic Programming 2012; Transactions on Computational Logic 2018; Transactions on Computational Biology and Bioinformatics 2017; Transactions of Computational Systems Biology 2008; Transactions on Modeling and Computer Simulation 2014; Transactions on Programming Languages and Systems 2001, 2006, 2007, 2014.

- External Reviewer for the Microsoft Research European Ph. D. Scholarship program 2006, the ANR-white program 2010 and 2013, the ANR INS program 2013, and the Swiss National Science Foundation’s Merit Review Process 2014.

RECRUITING COMMITTEES

- 2017-2018: Member of a recruitment committee for assistant professors at the University Paris-Diderot, May 2018;
- 2016-2017: Member of a recruitment committee for assistant professors at the University of Evry, May 2017;
- 2015-2016: Member of a recruitment committee for assistant professors at the University Paris-Diderot, May 2016;
- 2014-2015: Member of the recruiting jury for junior research scientists (CR2) at INRIA Paris-Rocquencourt;
- 2011-2013: Member of three recruitment committees for assistant professors at the University of Lille 1, May 2011, May 2012, May 2013.

PH. D. JURIES

- Jury member of Mounir Assaf’s Ph. D. (Irisa, May 2015).
- Reviewer of Peter Kreyßig’s Ph. D. (Friedrich-Schiller-Universität Jena, Germany, March 2015).
- Jury member of Arlen Cox’ Ph. D. (University of Colorado, Boulder, USA & École normale supérieure, Paris, France, November 2014).
- Jury member of Geoffroy Andrieux’ Ph. D. (Irisa, July 2013).
Current position: Post-doctoral researcher at the Institute for Molecular Medicine and Cell Research in Freiburg, Germany.
- Reviewer of Tatjana Petrov’s Ph. D. (ETH Zürich, June 2013).
Current position: Post-doctoral researcher at IST Vienna, Austria.
- Reviewer of Vincent Noël’s Ph. D. (University of Rennes 1, December 2012).
Current position: Post-doctoral researcher at Butantan Institute, São Paulo, Brasil.
- Jury member of Loïc Paulevé’s Ph. D. (École Centrale Nantes, Octobre 2011).
Current position: Junior researcher at CNRS, University Paris-South, France
- Jury member of Sylvain Pradalier’s Ph. D. (École Polytechnique, September 2009).
Current position: R&D Bioinformatics engineer at Dassault Systems, France.

Team and lab activities

- July 2017 - present: deputy director of the studies in computer sciences at École normale supérieure.
- Jan 2016 - present: member of the INRIA Paris PhD Committee.
- Jan 2013 - present: member of the council of Laboratoire d’Informatique de l’École normale supérieure.
- Dec 2009 - June 2012: coorganizer (with Jean KRIVINE) of the working group of computational biology at École normale supérieure.

Research supervision

INTERNSHIPS

- January - June 2018: Aurélie Faure de Pebeyre (M1 student in the Interdisciplinary Approaches in Life Sciences (AIV) Master). Static analysis of polymers formation.
- July - August 2016: Anton Kulaga (M1 student in the Interdisciplinary Approaches in Life Sciences (AIV) Master). Design and development of a GUI to build, annotate, organize, and experiment models in Kappa.
- April - May 2016: Noémie Fong (L3 student in the department of Computer Sciences of École normale supérieure). Bibliographic works on static analysis of security properties.
- November 2015 - August 2016: Ken Chanseau Saint-Germain (M2 student in the Parisian Research Master in Computer Science (MPRI)). Numerically approximated model reduction.
- January 2016 (one week): Nina Varchavsky (L1 student in the Frontier of Life Science bachelor program). Introduction to static analysis.
- April - June 2013: Delphin Senizergues (L3 student in the mathematic department of École normale supérieure). Bibliographic works on model reduction.
- December 2013 (one week): Benjamin Audry (13 year student at College du Parc, Sucy en Brie). Randomized generation and exploration of mazes.
- January 2014 (one week): Emile Ferreux and Nessim Morsli (L1 students in the Frontier of Life Science bachelor program). Self-assembly of landscapes and dynamics of populations in Kappa.
- April - June 2014: Mendes Oulamara (L3 student in the computer science department of École normale supérieure). Bibliographic works on the verification of digital filters.
- May - July 2014: Pretesh Agrawal (Master student, IIT Kanpur, India). Stochastic systems.

PH. D. STUDENTS

- 2017 - present. Marc Chevalier. Static analysis of security properties in software-intensive embedded systems. **Funding:** Bologna grant and AbstractCell ANR-project. AnaStaSec ANR-project.
- 2011 - 2017. Ferdinanda Camporesi. Model reduction for model of signaling pathways. Supervision of 80% of the Ph. D. work. 6 publications in international conferences during the Ph. D. **Funding:** Bologna grant and AbstractCell ANR-project.
- 2013 - 2016. Mehdi Bouaziz. Static analysis of security property in industrial code. Supervision of 100% of the Ph. D. work. **Funding:** MBAT European project.

POST-DOCTORAL STUDENTS

- May 2016 - April 2018: Ferdinanda Camporesi. Modeling the extra-cellular matrix of the transforming growth factor. Supervision of 100 % of the post doctoral work. **Funding:** ITMO Plan Cancer.
- Jan 2015 - Dec 2017: Lý Kim Quyên. Implementation of KaSa, static analyzer for rule-based models. Supervision of 100% of the post doctoral work. **Funding:** Big Mechanism DARPA project.

- Jan - Oct 2011: Alessandro Romanel. Formal foundation for infinite differential semantics. Supervision of 100% of the post doctoral work. **Funding:** AbstractCell ANR-project. **Current position:** Post-doctoral fellow in the university of Trento, Italy.
- Nov 2011 - Oct 2012: Jonathan Hayman. Foundation of causality for model of signaling pathways. Supervision of 100% of the post doctoral work. 3 publications in international conferences on this topic during his Post-Doc. **Funding:** AbstractCell ANR-project. **Current position:** Research associate in Computer Laboratory in the University of Cambridge, UK.
- Oct 2012-Dec 2012: Luca Grieco. Translation from CellDesigner to Kappa. Supervision of 100% of the post doctoral work. A prototype has been released. **Funding:** AbstractCell ANR-project. **Current position:** Post-doctoral fellow in Pierre and Marie-Curie University, France.
- Feb 2012 - present: Norman Ferns. Approximate bisimulation frameworks for continuous stochastic models. Supervision of 100% of the post doctoral work. **Funding:** AbstractCell ANR-project.
- Dec 2013 - Nov 2014: Wassim Abou-Jaoudé. Automatic Synthesis of Qualitative models for signaling pathways. Supervision of 50% of the post doctoral work. **Funding:** Action Incitative (ENS).

Teaching

FIRST CYCLE (1030 HOURS)

- 2016 - 2018: Lectures (15 hours/year) in the bachelor program of the department of computer sciences of the École normale supérieure, semantics and applications to verification (L3);
- 2011 - 2017: Lectures (between 13 and 40 hours/year) in the “Frontiers in Life Sciences FDV Bachelor” program, about logic and linear algebra (L1);
- 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.

SECOND CYCLE (247 HOURS)

- 2009 - present: Lectures and practical sections (between 4 and 18 hours/year) for the program “Master to life sciences” (AIV) in the course on Computational Biology II;
- 2000 - present: Lectures (between 3 and 15 hours/year) for the program “Parisian Master of Research in Computer Science” (MPRI) in the course on Abstract Interpretation;
- 2017 - 2018 : Intervention (3 heures) for the program “Master AIRE EdTech” (CRI), impact of the numerical revolution in scientific activity;
- 2015 - 2016: Lecture (2 hours) for the program M2IF (ÉNS Lyon) in the context of Russ Harmer’s course on Rule-based modelling;
- 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;

INTERVENTION IN UNIVERSITIES ABROAD OR IN THEMATIC SCHOOLS (60 HOURS)

- 2013 - 2014: Lectures (8 hours) for graduate students in East China Normal University (ECNU) “Abstract Interpretation Course”, Shanghai, China;
- 2012 - 2013: Lectures (3 hours) in the summer school “Modélisation Formelle de Réseaux de Régulation Biologique”, Porquerolles, France;
- 2011 - 2012: Lectures (2 hours) in the “Chair of Programming Methodology” at ETH Zürich, course on Static Program Analysis;
- 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 biomolecular networks;
- 2008 - 2009: Lectures (15 hours) for graduate students in Seoul National University invited by Kwangkeun Yi, on abstract interpretation and its applications;
- 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;

The second cycles lectures and the intervention in universities abroad have been delivered in English.

Interests

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