Florent Kirchner

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Professional Interests

Research and development positions; Software safety and Formal methods
Computer systems, languages, and paradigms

Work Experience

July – August 2001

ICASE/NASA, Virginia, USA.
Visiting student — *Software engineering and air traffic management.*
I implemented airborne conflict resolution algorithms in Java (1000loc.), working in close collaboration with scientists and contributing to the final design and publication of these algorithms.

March – August 2002

Dassault Aviation, Saint-Cloud, France.
Intern Engineer — *Software engineering and aerospace.*
I designed and implemented an UCAV mission planning tool in Java. This involved successfully interacting with very diverse company divisions to assert the usability of existing platforms, produce and review specifications, implement and validate the tool.

March – August 2003

INRIA, Ecole Polytechnique and NIA/NASA, Saclay, France and Virginia, USA.
Master's student intern— *Formal methods.*
This prelude to my Ph.D work required making a strong statement about my ability to quickly isolate, analyze and solve a difficult problem. I succeeded in bringing together the very diverse features of the Coq and PVS proof languages into one common core, reviewed and approved by members of both communities.

September 2003 – August 2007

INRIA, Ecole Polytechnique and NIA/NASA, Saclay, France and Virginia, USA.
Ph. D Researcher — *Formal methods.*
During this period I studied the delicate problem of compatibility between several logical frameworks, exposing several solutions to this problem and heading the implementation of a tool dedicated to sharing critical formal developments between Coq and PVS (7500loc. of OCaml). This long-term project allowed me to demonstrate a sound capability of organization, effective scientific watch, numerous interactions with the academic community and an efficient combination of independence, teamwork, creativity and dedication.

September 2007 – August 2008

SRI International, California, USA.
Postdoctoral Researcher — *Formal methods and Distributed Systems.*
In the continuation of my Ph.D work, I joined the formal methods team to develop the Evidential Tool Bus, a system for coordinating distributed formal verification tools. This involved rapidly getting up to speed with the methods and tools of the team, assessing project priorities and existing tools, and jump-starting the implementation effort (3800loc. of Perl/Java/MSV/JRDF/OAA). This stay also saw the submission of a joint NSF proposal on formal digital forensics.

Education

1985 – 1986

First Grade.
El Carmelo School, California, USA.

1999 – 2002

Engineering degree with honors, Pegasus Award — Computer Science and Air Traffic Management.

ENAC French Civil Aviation School, Toulouse, France.

2001 – 2002 Master as an exchange student, GPA: 3.750 / 4 — Computer Science
Illinois Institute of Technology, Chicago, Illinois, USA.

2002 – 2003 Master's degree with honors — Computer Science: Semantics, Proofs and Languages.
École Normale Supérieure de Cachan, Paris, France.

2003 – 2007 Ph. D degree with highest honors — Computer Science: Interoperable Proof Systems.
École Polytechnique, Saclay, France.

Personal skills and Competences

Natural languages: French, mother tongue | English, fluent | German, basic

Software paradigms: Linux, Java, Ada, OCaml, Python, Coq, PVS, SAL, Yices

French and Californian driver's license

Publications

Journals and conferences

Partial list, 4 other publications available online.

Florent Kirchner and François-Régis Sinot.
Rule-based operational semantics for an imperative language.
In *Proc. 7th Int. Workshop on Rule Based Programming*, volume 174 of *Electronic Notes in Theoretical Computer Science*, pages 35–47. Elsevier Science, 2007

Claude Kirchner, Florent Kirchner, and Hélène Kirchner.
Strategic computations and deductions.
In *Reasoning in Simple Type Theory*, volume 17 of *Mathematical Logic and Foundations*. College Publications, 2008

Florent Kirchner and César Muñoz.
The proof monad.
Submitted to the Journal of Logic and Algebraic Programming, 2008

Ashish Gehani, Florent Kirchner, and Natarajan Shankar.
Support system for forensic evidence.
Accepted at the Fifth Annual IFIP WG 11.9 International Conference on Digital Forensics, 2009

Memoirs and Reports

Florent Kirchner.
Optimal unconstrained solution to conflict resolution in 3-D aispace, August 2001.
Internship report

Alfons Geser, César Muñoz, Gilles Dowek, and Florent Kirchner.
Air traffic conflict resolution and recovery.
Technical Report Report No. 2002-12 NASA/CR-2002-211637, ICASE-NASA Langley, May 2002

Florent Kirchner.
Towards a common tactical language : The case of Coq and PVS.
Master's thesis, DEA Programmation : Sémantique, Preuves et Langages, 2003

Florent Kirchner.
Interoperable proof systems.
PhD thesis, École Polytechnique, 2007

Manuals and Documentation

Hugo Herbelin, Florent Kirchner, Benjamin Monate, and Julien Narboux.
Coq version 8.0 for the clueless (174 hints), `http://coq.inria.fr/doc/faq.html`, 2004

Florent Kirchner and Claudio Sacerdoti Coen.
The Fellowship proof manager, 2007

The CSL Formal Methods and Dependable Systems Group.
The Evidential Tool Bus, 2008