

Dr Christian Rinderknecht

Compiler Engineer, Domain-Specific Languages, Formal Methods

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Key skills and Knowledge

- Language Design and Interpreter/Compiler Construction.
- Research and Development of Software
- Multidisciplinary engineering (SE, telecom, electronics)
- Protocol Engineering and Model-based Test Generation
- International work experience (France, Korea, Hungary, Sweden)
- Professional Tutor and Academic Educator
- Technical Documentation and Scholarly Publications
- Bilingual French/Spanish and Fluent English (C1 level 93%)

Employment History

2018- Nomadic Labs (Paris, France)

Compiler Engineer

Joined the core dev-team behind the Tezos cryptocurrency, where I can work on efficient, secure and self-governing blockchains with certified Smart Contracts, thanks to the OCaml programming language.

2017-2018 GrAI Matter Labs (Paris, France)

Compiler Engineer

Design of a Domain-Specific Language based on OCaml for describing a new kind of computational neuromorphic spiking network, and implementation (in OCaml) of an interpreter and two compilers to OCaml, leveraging the existing ecosystem and tools.

2016-2016 Wolfram | MathCore (Linköping, Sweden)

Compiler Engineer

Design and implementation (using OCaml) of a correct and complete set of parsers for the Modelica compiler of Wolfram SystemModeler, featuring a precise, correct and complete set of syntax errors thanks to the parser generator Menhir.

2015-2016 Numalis (Montpellier, France)

Compiler Engineer

Development of tools in C++ and OCaml for assessing the loss of accuracy in floating-point calculations, by means of source-to-source transformations (standalone and based on Clang/LLVM) of C++ code.

2014-2015 Cortus (Montpellier, France)

Compiler Engineer

Maintenance and development of a .NET compiler (in C# and OCaml) for Cortus microprocessors.

2001-2014 *Researcher and University Professor* (France, Korea, Hungary)

(École Supérieure d'Ingénieurs Léonard de Vinci, Konkuk University, Eötvös Loránd University) R&D on compiler construction, protocol verification, domain-specific language design (Internet of Things), augmented reality, web-based framework for e-learning. Teaching of programming to undergraduates and postgraduate students.

2000 PolySpace Tech. (now MathWorks, Montbonnot, France)

R&D Engineer

Development of a static analyser for JavaCard, automatic testing, reverse-engineering and maintenance, case studies and sales support.

1998-00 National Institute of Telecommunications (now Télécom SudParis)

R&D Engineer (Software for Networking Lab.)

R&D projects, specification-based test generation for telecommunication services, development of tools for protocol testing.

1997-98 Alcatel-Alsthom CRC (now Alcatel-Lucent R&I, France)

Case Engineer (Object Architecture Unit)

Design of a software quality analysis for a C++ project (networking).

Education

1993-98 INRIA & Pierre and Marie Curie University (France)

Ph.D. in Informatics (cum laude)

Design and implementation of an analyser for ASN.1. Soundness proof of the BER (encoding rules). Working group at ISO on ASN.1 (London, 1997).

Tools and formal languages

- *Programming languages*: Java, OCaml, Erlang, C, C#, C++, F#, XSLT, Eiffel, Ada, Perl, Standard ML, Prolog, Pascal.
- *Markup technologies*: L^AT_EX, XML, DTD.

- *Protocol engineering*: ObjectGeode, Tau (Telelogic), LOTOS, ASN.1, TTCN-3, MSC, SDL, specification-based test generation, automata theory.
- *Software engineering*: Test generation, compiler construction, static analysis, formal methods (specification, correctness), Docker Engine/Machine.
- *System administration*: Linux, OS X.
- *Databases*: SQLite.
- *Development tools*: Monodevelop (a.k.a. Ximian Studio), Emacs, make-files, shell scripting, versioning (CVS, Subversion, Git), scanning and parsing (sed, ocamllex, menhir) etc.
- *Free Software*: Shell scripts for Linux system administration, a pretty-printer for T_EX messages, a build system for OCaml, an OCaml library for dictionaries based on ternary search trees, a preprocessor for C[#].

Publications and Honours

- 15 papers in journals and conferences, 3 technical reports.
- *Design and Analysis of Purely Functional Programs* (volume 15, *Texts in Computing*, College Publications, UK, Nov 2012, 660 pages).
- Translator in French of the love poems *Veintes poemas de amor y una canción desesperada* of Pablo Neruda (Gallimard Poésie, Paris, 1998).
- Editor and translator in Spanish of an anthology of poetry by Paul Valéry, *Las granadas* (Ediciones Rilke, Madrid, 2016).
- I contributed some Buddhist vocabulary to the Sanskrit Heritage (French-Sanskrit dictionary, 1998) of Gérard Huet (<http://sanskrit.inria.fr/Heritage.pdf>).
- One of my mathematical articles is the source for the integer sequence <http://oeis.org/A261003>.
- I received a cheque from Knuth for finding an error in Volume 4 of *The Art of Computer Programming*.
- I am a cello player and write poetry.

References

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- [3] Christian Rinderknecht. *Communication Model in Distributed Cyber-Physical Systems*, chapter Model-based design and testing. Eötvös Loránd University, June 2013. 19 pages.
- [4] Christian Rinderknecht. **A Didactic Analysis of Merge Sort**. *Teaching Mathematics and Computer Science*, 11(2):195–210, October 2013.
- [5] Christian Rinderknecht. ***Conception et analyse des programmes purement fonctionnels***, volume 12 of *Cahiers de logique et d'épistémologie*. College Publications, United Kingdom, second edition, May 2012. 528 pages, author's translation of [6].
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- [8] Juan Diego Tascón Vidarte, Christian Rinderknecht, Jee-In Kim, and HyungSeok Kim. **A Tangible Interface for Learning Recursion and Functional Programming**. In *Proceedings of the International Symposium on Ubiquitous Virtual Reality*, Gwangju, Republic of Korea, July 2010.
- [9] Christian Rinderknecht and Nic Volanschi. **Theory and Practice of Unparsed Patterns for Metacompilation**. *Science of Computer Programming*, 75(3):85–105, March 2010.
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Workshop, pages 154–170, Ottawa, Canada, June 2004. LNCS, Springer Verlag.

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