Dr Christian Rinderknecht

Compiler Engineer, Domain-Specific Languages, Formal Methods

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Key skills and Knowledge

- Language Design and Interpreter/Compiler Construction.
- Multidisciplinary engineering (SE, telecom, electronics)
- Protocol Engineering and Model-based Test Generation
- International work experience (France, Korea, Hungary, Sweden)
- Ex-college professor and Researcher
- Technical Documentation and Scholarly Publications
- Bilingual French/Spanish and Fluent English (C1 level 93%)

Employment History

2023- Turnstiles Kft. (Budapest, Hungary)
Founder
Freelance expert in compilers, program transformations, logic sytems, syntax and semantics.

2019-2023 LIGO lang (Paris, France)
COO & Compiler Engineer
Lead dev on the front-end of the LIGO compiler for smart contracts on Tezos.

2018-2019 Nomadic Labs (Paris, France)
Compiler Engineer
Joined the core dev-team behind the Tezos cryptocurrency, where I worked 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 of a standalone interpreter and a transpiler to OCaml.

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.

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)
Formalisation of ASN.1, design and implementation of an analyser for ASN.1. Soundness proof of the Basic Encoding Rules (BER). Working group at ISO on ASN.1 (London, 1997).

Tools and formal languages

- *Programming languages*: Java, OCaml, Erlang, C♯, C++, XSLT, Ada, Standard ML, Prolog, Pascal.
- *Markup technologies*: LaTeX, XML, DTD, Markdown, JSON.
- *Software engineering*: Test generation, compiler construction, static analysis, program transformations, formal methods (specification, correctness)
- *Development tools*: Emacs, GNU Make, dune, git, shell scripting, scanning and parsing (sed, ocamllex, menhir) etc.
- *Free Software*: `http://github.com/rinderknecht`

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). I translated my book into French for the same publisher: *Conception et analyse des programmes purement fonctionnels* (volume 12, *Cahiers de Logique et d'Épistémologie*, 2012).
- 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*.
- Translator from/to French/Spanish of the love poems (*Vingt poèmes d'amour et une chanson désespérée* by Pablo Neruda (Gallimard Poésie, Paris, 1998), *Las granadas* by Paul Valéry, (Ediciones Rilke, Madrid, 2016), *Rimes* by Gustavo Adolfo Bécquer (L'Harmattan, Paris, 2024)).
- I contributed some Buddhist vocabulary to the Sanskrit Heritage (French-Sanskrit dictionary, 1998) of Gérard Huet (`http://sanskrit.inria.fr/Heritage.pdf`).
- I am a cello player and I publish poetry in English.