# Dr Christian Rinderknecht

Theory of Programming Languages, Compiler Construction,
Blockchains, Virtual Machines, Domain-Specific Languages,
Functional Languages, Formal Methods

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## Key skills and knowledge

- College professor and researcher (2001-2014)
- International work experience (France, Korea, Hungary, Sweden)
- Theory of programming languages and functional languages
- Interpreter and compiler construction
- Smart contract languages and Virtual Machines for blockchains
- Protocol engineering and model-based test generation
- Technical documentation and scholarly publications (papers, books)
- Bilingual French/Spanish and fluent English (C1 level 93%)

## Employment History

**2023-** Turnstiles Kft. (Budapest, Hungary)
*Founder*
Freelance expert in compilers, program transformations, static analysis, logic systems (syntax and semantics — the two turnstile symbols).

**2018-2025** LIGO (Paris, London)
*COO of LIGOlang & Compiler Engineer*
Design of the high-level smart contract language LIGO for the blockchain Tezos and lead dev on the compiler front-end of LIGO in OCaml.

**2017-2018** GrAI Matter Labs (Paris, France)
*Compiler Engineer*
Design of a Domain-Specific Language for describing a new kind of computational neuromorphic spiking network, and implementation of a standalone interpreter and a transpiler to OCaml to build the networks.

**2016** Wolfram | MathCore (Linköping, Sweden)
*Compiler Engineer*
Design and implementation in 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.

**2014-2015** Cortus, Numalis (Montpellier, France)
*Compiler Engineer*
Maintenance and development of a .NET compiler (in C♯ and OCaml). 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.

**2001-2014** *Researcher and University Professor* (France, Korea, Hungary)
*Professor & Researcher* (Information and Communications University, École Supérieure d'Ingénieurs Léonard de Vinci, Konkuk University, Eötvös Loránd University)
Teaching of programming (OCaml, Prolog, Erlang, XSLT, C/C++, Pascal, Java), software engineering, internet protocols, algebraic specifications, automata theory, parsing theory, static program transformations etc. Scholarly publications on compiler construction, protocol verification, domain-specific language design, didactic of programming languages, functional programming and mathematical analysis of algorithms (book).

**2000** PolySpace Tech. (now MathWorks, Montbonnot, France)
*Compiler Engineer*
Development of a static analyser for JavaCard, automatic testing, reverse-engineering and maintenance, case studies and sales support.

**1998-2000** 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. Scholarly publications.

**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)*
Theory of programming languages. Formalisation of ASN.1, design and implementation of the front-end of an ASN.1 compiler in OCaml. Soundness proof of the Basic Encoding Rules (BER). Working group at ISO on ASN.1 (London, 1997).

### Publications, Honours and Miscellanea

Informatics:

- Fifteen (15) papers in journals and conferences, three (3) extensive technical reports.
- *Design and Analysis of Purely Functional Programs* (volume 15, *Texts in Computing*, College Publications, UK, Nov 2012, Third Edition 2025, 598 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*.

Literature & Music:

- Translator from Spanish to French of *Vingt poèmes d'amour et une chanson désespérée* by Pablo Neruda (Gallimard Poésie, Paris, 1998).
- Contributor of Buddhist vocabulary to the *Sanskrit Heritage* (French-Sanskrit dictionary, 1998) of Gérard Huet (`http://sanskrit.inria.fr/Heritage.pdf`).
- Editor and translator from French to Spanish of an anthology of the poetry of Paul Valéry, *Las granadas* (Ediciones Rilke, Madrid, 2016).
- Editor and translator from Spanish to French of the complete poetry of Gustavo Adolfo Bécquer, *Rimes* (L'Harmattan, Paris, 2024).
- Publisher of my own poetry (*Running on*) in English (2024).
- Working nowadays on an anthology and translation from Hungarian to English, French and Spanish of the poetry of József Attila.
- Cello player (Baroque *piccolo cello*).

## References


[1] Nachum Dershowitz and Christian Rinderknecht. **The Average Height of Catalan Trees by Counting Lattice Paths**. *Mathematics Magazine*, 88(3):187–195, June 2015. 18 pages (preprint, including supplement).

[2] Christian Rinderknecht. **A Survey on Teaching and Learning Recursive Programming**. *Informatics in Education*, 13(1):87–119, April 2014.

[3] Christian Rinderknecht. *Communication Model in Distributed Cyber-Physical Systems*, chapter Model-based design and testing. Eötvös Loránd University, June 2013. 19 pages, `https:`

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[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, third edition, May 2012. 546 pages, author's translation of [6].

[6] Christian Rinderknecht. ***Design and Analysis of Purely Functional Programs***, volume 15 of *Texts in Computing*. College Publications, United Kingdom, third edition, January 2012. 598 pages.

[7] Christian Rinderknecht. **A Didactic Analysis of Functional Queues**. *Informatics in Education*, 10(1):65–72, April 2011.

[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.

[10] Nic Volanschi and Christian Rinderknecht. **Unparsed Patterns: Easy User-extensibility of Program Manipulation Tools**. In *Proceedings of the ACM SIGPLAN Symposium on Partial Evaluation and Semantics-based Program Manipulation (PEPM)*, pages 111–121, San Francisco, USA, January 2008.

[11] Christian Rinderknecht. **Matching Pairwise Divergent Paths in XML Streams**. *Journal of Industrial Science and Technology*, 32:57–75, December 2007.

[12] Patrick Duval, Agathe Merceron, Christian Rinderknecht, and Michel Scholl. **LeVinQam: A Question Answering Mining Platform**. In *Proceedings of the Fifth International Conference on Information Technology-based Higher Education and Training (ITHET)*, Istanbul, Turkey, June 2004.

[13] Christian Rinderknecht. **Proving a Soundness Property of the Joint Design of ASN.1 and the Basic Encoding Rules**. In *System Analysis and Modeling (SAM), Fourth International SDL and MSC*

*Workshop*, pages 154–170, Ottawa, Canada, June 2004. LNCS, Springer Verlag.

[14] Christian Rinderknecht. **An Algorithm for Validating ASN.1 (X.680) Specifications using Set Constraints**. *The Computer Journal*, 46(4):401–420, July 2003.

[15] Ana Cavalli et al. **PLATONIS: A Platform for Validation and Experimentation of Multi-protocols and Multi-services**. In *Applications and Services in Wireless Networks (ASWN)*, pages 217–229, Évry, France, July 2001.

[16] Ana Cavalli, Bruno Defude, Christian Rinderknecht, and Fatiha Zaïdi. **A Service-component Testing Method and a suitable CORBA Architecture**. In *Proceedings of the Sixth IEEE Symposium on Computers and Communications (ISCC)*, pages 655–666, Hammamet, Tunisia, July 2001.

[17] Ana Cavalli, Bruno Defude, Christian Rinderknecht, and Fatiha Zaïdi. **Test de composants de service et exécution de tests sur une plate-forme CORBA**. In *Actes de la Conférence Francophone en Ingénierie des Protocoles*, pages 363–378, Toulouse, France, October 2000. Hermes.

[18] Ana Cavalli, David Lee, Christian Rinderknecht, and Fatiha Zaïdi. **Hit-or-Jump: Un algorithme pour le test imbriqué avec des applications aux services R.I.** In *Actes de la troisième édition des Journées Doctorales Informatique et Réseaux*. Institut National des Télécommunications, Évry, France, November 1999.

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[20] Christian Rinderknecht. ***Une formalisation d'ASN.1 — Application d'une méthode formelle à un langage de spécification télécom***. PhD thesis, Université Pierre et Marie Curie (Paris 6), December 1998. 350 pages.

[21] Michel Mauny and Christian Rinderknecht. Position paper about the ASN.1 Formal Model, 1997. ISO working document.

[22] Christian Rinderknecht. **Une analyse syntaxique d'ASN.1:1990 en Caml Light**. Technical Report 171, INRIA, April 1995. 230 pages, English at `https://github.com/rinderknecht/Papers/blob/main/TechRep/INRIA_TR171/TR171-eng.ps`.