

EDUCATION

- 2011-now **Temporary Teacher and Researcher (ATER)**, *Proofs Programs Systems Lab.*, Univ. Paris 7.
- 2007-2011 **Ph.D. Thesis in computer science**, *Proofs Programs Systems Lab.*, Univ. Paris 7, under the supervision of Delia Kesner.
- 2010 **CEA-EDF-INRIA Summer school on the Coq proof assistant**, *One week on modelling and verifying algorithms in Coq*, Lectures by P. Letouzey, Y. Bertot, P. Castéran and A. Mahboubi.
- 2006-2007 **Master 2 in theoretical computer science (MPRI)**, *Univ. Paris 7*.
Some courses followed:
- Foundation of proof systems (lectures by Benjamin Werner, Alexandre Miquel)
 - Proof assistants (lectures by Hugo Herbelin, Jean-Christophe Filliâtre)
 - Functional programming and type systems (lectures by Xavier Leroy, François Pottier,...)

PH.D. THESIS

The starting point of my Ph.D. thesis was a linear calculus with explicit substitution which took place in a prismoid where vertices are different calculi [KR09, KR11]. I studied properties such as confluence [Ren] and typing for all languages designed in this prismoid from a general point of view.

Preservation of Strong Normalization (PSN) then became my main focus. I studied amongst other, PSN for axiomatic calculi with explicit substitution. I then studied relation between explicit substitutions, abstract machines and head linear reduction.

From a practical point of view, I analyzed the complexity of a calculus with explicit substitutions, formalised and proved some properties of a non-deterministic calculus with explicit substitutions using Coq [RZ].

CURRENT INTERESTS

- Formal descriptions of functional programming
- Formalization of proofs
- Lambda calculi (typed, untyped) and strategies
- Explicit substitutions, resources and links to linear logic
- Abstract machines for various calculi

INTERNATIONAL TALKS without committee selection

- 2011 **Metaconfluence of λ_j : dealing with non-deterministic replacements**, *Structural meeting, Innsbruck*.
- 2010 **Bounds for lengths of reductions in typed lambda calculus with explicit substitutions**, *Workshop Logic Algebra Calculus, Paris*.
- 2009 **Preservation of Strong Normalization for Higher-Order Rewriting Systems explicit**, *Workshop Paris-Innsbruck, Innsbruck*.

- 2009 **The prismoid of resources**, *Workshop Paris-Innsbruck, Paris*.
- 2008 **The cube of resources**, *Workshop Structural Proof Theory, Paris*.
- 2008 **Explicit parametric resources for lambda-calculus**, *UBA, Argentina*.

TEACHING (in French)

- 2011-2012 **Proofs of programs using Frama-C, Coq, 32h.**
- 2011-2012 **Advanced Software Engineering, 32h.**
- 2011-2012 **Advanced Functional Programming with OCaml, 32h.**
- 2010-2011 **Functional Programming with OCaml, 32h.**
- 2010-2011 **Supervision of projects, Software engineering, 32h.**
- 2009-2010 **Basic concepts of programming (data structures, recursivity, ...), 32h.**
- 2009-2010 **Introduction to operating systems, 32h.**
- 2008-2009 **Introduction to programming in Java, 64h.**

DISSEMINATION OF SCIENCE

I have participated to several science festivals in which young pupils can discover through games such as the Hanoi towers the basics of computer science.

ADMINISTRATION

- 2010-now **Ph.D. students representative at the laboratory council.**

LANGUAGE SKILLS

- French **Mother tongue**
- English **Fluent, CEFR C1**

GENERAL COMPUTER SKILLS

- Operating Systems GNU/Linux, Windows
- Programming languages OCaml, Python, Coq, Java, C

PUBLICATIONS

- [KR09] Delia Kesner and Fabien Renaud. The prismoid of resources. In Rastislav Královic and Damian Niwinski, editors, *MFCS*, volume 5734, pages 464–476, 2009.
- [KR11] Delia Kesner and Fabien Renaud. A prismoid framework for languages with resources. *Theor. Comput. Sci.*, 412(37):4867–4892, 2011.
- [Ren] Fabien Renaud. Metaconfluence of λ_j : dealing with non-deterministic replacements. Submitted.
- [RZ] Fabien Renaud and Stéphane Zimmermann. A formalisation of λ_j . The Coq development is available at <http://www.pps.jussieu.fr/~renaud/coq>.