

MATTHIEU SOZEAU
345 Beacon Street
02143 Somerville, MA

Phone : (+1) 617 710 6189
mattam@mattam.org
http://mattam.org



Born 22 February 1982 at
Massy.
French nationality.

Research interests

- Type theory and constructive logic
- Formal methods, particularly construction and proof of dependently-typed programs
- Functional and generic programming

Education

2009-10	Postdoctoral studies in the Ynot group. Working with Greg Morrisett and his team on Coq and Ynot. Harvard University.
2005-08	PhD in Computer Science. With honors. Paris XI University.
2004-05	Master of research in Computer Science. Grade A. Paris VII University - Denis Diderot.
2003-04	"Maitrise" of Computer Science. Grade B. Paris XI University.
2002-03	Licence in Computer Science. Grade B. Paris XI University.
2000-02	University Diploma of Technology in Computer Science. Grade B. Orsay's Institute of Technology.
1997-00	Scientific bachelor, mathematics speciality. Grade C. Lycée de la Vallée de Chevreuse.

International Conferences

- Matthieu Sozeau and Nicolas Oury. First-Class Type Classes. In César Muñoz Otmane Ait Mohamed and Sofiene Tahar, editors, *Theorem Proving in Higher Order Logics, 21th International Conference*, volume 5170 of *Lecture Notes in Computer Science*, pages 278–293. Springer, August 2008 (18/40)
- Matthieu Sozeau. Program-ing Finger Trees in Coq. In *ICFP'07: Proceedings of the 2007 ACM SIGPLAN International Conference on Functional Programming*, pages 13–24, Freiburg, Germany, 2007b. ACM Press (26/103)
- Matthieu Sozeau. Subset Coercions in Coq. In Thorsten Altenkirch and Conor McBride, editors, *TYPES'06*, volume 4502 of *Lecture Notes in Computer Science*, pages 237–252. Springer, 2007f (17/29)

International Workshops

- Matthieu Sozeau. A New Look at Generalized Rewriting in Type Theory. *1st Coq Workshop proceedings*, August 2009a

National Conferences

- Matthieu Sozeau and Nicolas Oury. Classes de types de première classe. In *Journées Nationales du GDR GPL*, Toulouse, France, January 2009

Theses

- Matthieu Sozeau. *Un environnement pour la programmation avec types dépendants*. PhD thesis, Université Paris 11, Orsay, France, December 2008l
- Matthieu Sozeau. Coercion par prédicats en Coq. Master's thesis, Université Paris VII, LRI, Orsay, 2005

Reference Manual Chapters

- Matthieu Sozeau. *Coq 8.2 Reference Manual*, chapter Type Classes. INRIA TypiCal, 2008b
- Matthieu Sozeau. *Coq 8.2 Reference Manual*, chapter User defined equalities and relations. INRIA TypiCal, 2008c
- Matthieu Sozeau. *Coq 8.2 Reference Manual*, chapter Program. INRIA TypiCal, 2008d

Invited Talks and Seminars

- Matthieu Sozeau. Programming with Dependent Types in Coq. PPS Seminar, 26th February 2009g
- Matthieu Sozeau. An Environment for Proving and Programming. LIFO Seminar, 26th January 2009e
- Matthieu Sozeau. An Environment for Programming with Dependent Types. ICIS Seminar, 20th January 2009d
- Matthieu Sozeau. First-Class Type Classes. Talk given at the Gallium seminar, 3rd November 2008f
- Matthieu Sozeau. Program-ing in Coq. Talk given at the Foundations of Programming seminar, 15th February 2008i
- Matthieu Sozeau. Program-ing in Coq. Talk given at Harvard, 23th january 2008j
- Matthieu Sozeau. Program-ing in Coq. Talk given at Portland State University, 16th january 2008k
- Matthieu Sozeau. Program-ing in Coq. Talk given at the Gallium seminar, 16th march 2007d

Conference Talks and Local Seminars

- Matthieu Sozeau. A New Look at Generalized Rewriting in Type Theory. Talk given at the First Coq Workshop, August 2009b
- Matthieu Sozeau. A New Look at Generalized Rewriting in Type Theory. TYPES'09, May 2009c
- Matthieu Sozeau. First-Class Type Classes. Talk given at the GDR GPL, 30th January 2009f
- Matthieu Sozeau. An Environment for Programming with Dependent Types. Thesis Defense, 8th December 2008a
- Matthieu Sozeau. First-Class Type Classes. Talk given at TPHOLs'08, 20th August 2008g
- Matthieu Sozeau. First-Class Type Classes, in Coq. Talk given at the ProVal workgroup, 3rd March 2008h
- Matthieu Sozeau. Dependent Finger Trees. Talk given at DTP'08, 18–20 February 2008e
- Matthieu Sozeau. Program-ing Finger Trees in Coq. Talk given at ICFP'07, 1–3 October 2007c
- Matthieu Sozeau. A journey with Russell: Programming Dependent Finger Trees in Coq. Talk given at TYPES'07, 2-5 May 2007a
- Matthieu Sozeau. Program-ing in Coq. Talk given at the ProVal seminar, 9th march 2007e
- Matthieu Sozeau. Subset Coercions in Coq. Talk given at TYPES'06, 19-21 april 2006

Community service

- PC member: TLDI'10 , ICFP'10 .
- External reviews: TPHOLs'08 , FLOPS'08 , FundamentaInformaticae , TPHOLs'09 , PPDP'09 .

Jobs and internships

March 2009 - ...	Postdoctoral Fellow. Harvard University.
September to December 2008	Temporary researcher at CNRS. Paris XI University.
2005-2008	PhD Thesis funded by the french government. Paris XI University.
2005-2008	Teaching assistant position in Computer Science. Paris XI University.
March to September 2005	Master internship on the development of an environment for programming with dependent types. With CHRISTINE PAULIN-MOHRING. Paris XI University.
July / August 2004	Internship on optimisation of pattern-matching in CDuce. With GIUSEPPE CASTAGNA. Computer Science Laboratory of ENS Ulm.
April to June 2004	Internship on graph triangulation. With PASCAL BERTHOMÉ. Laboratoire de recherche en informatique, Paris XI University.
Summer 2003	Optimisation of a real-time video process. With PIERRE GAROCHE. Laboratoire de physique des solides, Paris XI University.
Summer 2002	Update and maintenance of a product management software. Thalès.
September 2000	Interim work. Manpower.

Teaching

I held a teaching position at the University of Paris XI for the duration of my thesis.

2007-2008

- **The Functionnal Approach to Algorithmics**

Second year of University, first semester

20 hours of directed works, 15 hours of practical works.

Description Introduction to functionnal programming and the basics of algorithmics. The focus of the course is on types, recursive functions, algebraic datatypes and modular programming this time.

- **Administration of the practical works network**

Equivalent to 20 hours of directed works.

Description Administration of the computer network used by students. The architecture is a Linux server and diskless terminals, it is mostly maintainance and setting up new servers.

2006-2007

- **Unix project**

Third year of University, first semester

40 hours of practical works (two groups).

Description Initiation to Unix, shell programming, Python programming and various tools, including editors and RCS.

- **Languages and Software Engineering**

Second year of University, second semester

12 hours of practical works, 2 hours of directed works.

Description Introduction to software engineering methods using a medium-size project and paired programming. The subject was the development of an Arkanoid clone in OCaml, from the game model to the interaction loop excluding the graphical library.

- **The Functionnal Approach to Algorithmics**

Second year of University, first semester

20 hours of practical works, 4 hours of directed works.

Description Introduction to functionnal programming and the basics of algorithmics. The course focused on recursive functions and simple algebraic datatypes.

- **Administration of the practical works network**

Equivalent to 20 hours of directed works.

Description Administration of the computer network used by students. The architecture is a Linux server and diskless terminals, it is mostly maintainance and setting up new servers.

2005-2006

- **Compilation project**

Fourth year of University, first semester

40 hours of practical works, 10 hours of directed works.

Description Compilation of a pascal-like language with pattern-matching using OCaml. Includes sum types declarations, arrays, references, functions and procedures. The project is done in three phases: lexing and parsing with `ocamllex` and `ocamlyacc`, typing and code generation for a stack-based virtual machine.

- **Introduction to Computer Science**

First year of University, first semester

20 hours of directed works.

Description

- Integer, floating-point representations. Simple cryptographic codes.
- Basic processor architecture and assembler program interpretation.
- Manipulation of numbers, arrays and strings with conditionals, loops in restricted C. Same thing in assembler.

Development experience

- Major contributor to the Coq project written in OCaml
- Web development using CGIs, LAMP, XML/XSLT/XSP's, Java applets, Javascript
- C, C++ and assembler programming, optimizing for x86
- OpenGL programming in C and OCaml

Technical Knowledge

- W3C Markup languages
- Programming languages: OCaml, Coq, Haskell, C, asm x86, C++, Java, Python, Ruby
- Program certification and theorem proving in the Coq proof-assistant

- Administration under GNU/Linux of Apache, Samba, Squid, CUPS, qmail, courier, iptables, nfs and nis

Open Source software

- Yaxi, an XML/XPath/XSLT library for OCaml
- Hamilcar, an XML application server in OCaml
- Past Gentoo Linux (www.gentoo.org) and XMMS developer (www.xmms.org)