

# Curriculum Vitae

Stefano Zacchioli  
<[zack@pps.jussieu.fr](mailto:zack@pps.jussieu.fr)>

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## 1 Personal Data

**Name** Stefano Zacchioli

**Affiliation** Laboratoire PPS, Université Paris Diderot - Paris 7

**Work Address** 175 Rue du Chevaleret, 75013 Paris, France - office 5C01

**Work Phone** +33 1 44 27 8504

**Work Fax** +33 1 44 27 8654

**Birthday** 16/03/1979

**E-Mail** [zack@pps.jussieu.fr](mailto:zack@pps.jussieu.fr), [zack@upsilon.cc](mailto:zack@upsilon.cc), [zack@debian.org](mailto:zack@debian.org)

**Homepage** <http://upsilon.cc/~zack>

**GnuPG** Public Key Fingerprint:

- [8156 FBF9 3EC1 D872 722D 3632 D5CA 9B04 F2C4 23BC](#)

## 2 Education

**Jan 2004–Dec 2006** I have been a Ph.D. student at the Department of Computer Science, University of Bologna. My Ph.D. advisor has been Professor Andrea Asperti.

My Ph.D. thesis, titled “User Interaction Widgets for Interactive Theorem Proving” has been defended successfully in April 2007.

**Feb–May 2006** I have been a visiting researcher at the Computer Science Department of the Brown University, Providence, RI. There, I have been working on (wiki-like) collaborative technologies for the authoring of constrained documents. My advisor there has been Professor David G. Durand.

**May–Dec 2003** I have been a visiting researcher at the Laboratoire d’Informatique de l’École Normale Supérieure, Paris. During that period I have been working as a member of the CDuce team on the development of the [CDuce](#) programming language.

**Mar 2003** I have got a Master Degree in computer science with a rating of 110/110 *cum laude* at the Department of Computer Science, University of Bologna.

My master thesis has been titled “Web Services per il supporto alla dimostrazione interattiva” (Web Services for Interactive Theorem Proving).

**1997–2002** I have been an undergraduate Students of Computer Science, with specialization in Distributed Systems, of the faculty of Mathematical, Physical and Natural Science of the University of Bologna.

During these five years I have been interested in distributed systems, operating systems design and implementation, theoretical computer science, formal logic and proof theory, software engineering, and functional programming.

During the last four years of attendance I have also been a volunteer system administrator of a (Debian) GNU/Linux network cluster (about 30 hosts).

**Jul 1997** I have got a diploma in Electronics and Telecommunications with a rating of 60/60 at the ITIS Ettore Majorana, Budrio (Bologna).

### 3 Research Interests

**Free and Open Source Software** in particular:

- the application of formal methods and automatic theorem proving for the solution of real-life constraints induced by the interaction of software components in GNU/Linux distributions

**Markup Languages** in particular:

- schema languages and rich type systems for XML documents with and without overlapping problems;
- efficient processing and representation of XML documents especially with respect to parsing, validation, un-marshalling, and transformation;

**Mathematical Knowledge Management** in particular:

- encoding of mathematical proofs and formulae in machine understandable formats suitable for proof checking, rendering, semantic searches, ...;
- large scale libraries of formalized mathematics;

**Interactive Theorem Proving and Proof Assistants** in particular:

- proof assistant usability and human computer interaction;
- interaction among libraries of formalized mathematics and tools for formal proof authoring (proof assistants and automatic theorem provers).

### 4 Current Work

**Mancoosi** I'm a member of the [MANCOOSI](#) (Managing the COmplexity of the Open Source Infrastructure), an European Union funded project for the application of formal methods to the solution of complexity issues in the management of GNU/Linux distributions.

In the context of Mancoosi, I'm currently working as a post-doc researcher at the PPS Laboratoire of Université Paris Diderot—Paris 7.

**Debian** I'm an official developer of the [Debian Project](#) since 2001. Starting from April 2010, I'm also covering the role of Debian Project Leader. Before that, my Debian activities have about the following topics:

- maintenance of packages related to the Objective Caml (OCaml) programming language (I'm maintaining a substantial part of the whole OCaml-related Debian packages, one of the founder of the [Debian OCaml Maintainers Task Force](#), co-editor of the Debian OCaml policy, and author of several tools for maintaining the consistency among OCaml-related packages)

- maintenance of packages related to the Vim editor
- Quality Assurance (QA) work: I have worked on infrastructure tools for the Debian QA team, most notably co-maintaining the Package Tracking System and its web front-end

## 5 Past Work

**TWEBBO** I've been a member of the web technologies research group of the Department of Computer Science, University of Bologna; the group is led by Professor Fabio Vitali.

There I've worked on overlapping markup, and constraint enforcement in web-based collaboration. I'm also still a member from the University of Bologna of the XML Schema Working Group of the World Wide Web Consortium (W3C).

**HELM** I've been a member of the [HELM](#) project, University of Bologna.

The HELM project is a long term project of the University of Bologna, aimed to the integration of the current tools for the automation of formal reasoning and the mechanization of mathematics (proof assistants and logical frameworks) with the most recent technologies for the development of web applications and electronic publishing, eventually passing through the Extensible Markup Language. The final aim is the development of a suitable technology for the creation and maintenance of a virtual, distributed, hyper-textual library of formal mathematical knowledge.

I'm still one of the developer of [Matita](#), an experimental, interactive theorem proving based on the Calculus of (Co)Inductive Constructions, compatible at some extent with [Coq](#) and integrated with HELM distributed library.

**CDuce** I have been a member of the CDuce team, where I have worked on the development of the [CDuce](#) programming language.

CDuce is a general purpose functional programming language, adapted to the manipulation of XML documents. The peculiar features of CDuce include: XML objects and functions as first class values, powerful pattern matching operations, rich type algebra (including recursive types and arbitrary boolean combinations of types), UTF-8 support, polymorphism (using a natural notion of sub-typing and overloaded functions with dynamic dispatch on types), highly-effective type-driven compilation schema.

I wrote the first implementation of CDuce support for XML Schema.

**MoWGLI** I have been a member of the (now completed) MoWGLI project.

[MoWGLI](#) was an European Union funded, IST project aimed at enriching web available mathematical knowledge with semantic information in order to pass from machine-readable to machine-understandable mathematical knowledge on the web.

## 6 Papers

### 6.1 Journal Articles

1. *Supporting Software Evolution in Component-Based FOSS Systems* with Roberto Di Cosmo, Davide Di Ruscio, Patrizio Pelliccione, Alfonso Pierantonio. Article in press, to appear in [Science of Computer Programming](#), ISSN 0167-6423. Elsevier, 2010. DOI 10.1016/j.scico.2010.11.001.
2. *Towards the unification of formats for overlapping markup* with Paolo Marinelli, Fabio Vitali. In *New Review of Hypermedia and Multimedia*, Volume 14, Issue 1, January 2008, pp. 57-94. Taylor and Francis, ISSN 1361-4568. DOI 10.1080/13614560802316145.

3. *Spurious Disambiguation Errors and How to Get Rid of Them* with Claudio Sacerdoti Coen. In *Mathematics in Computer Science*, Volume 2, Number 2, pp. 355-378, December 2008. Springer Birkhäuser, ISSN 1661-8270. DOI 10.1007/s11786-008-0058-2.
4. *User Interaction with the Matita Proof Assistant* with Andrea Asperti, Claudio Sacerdoti Coen, Enrico Tassi. In *Journal of Automated Reasoning*, Volume 39, Number 2. Springer Netherlands, ISSN 0168-7433, pp. 109-139, 2007. DOI 10.1007/s10817-007-9070-5.

## 6.2 Book Chapters

1. *Web Semantics via Wiki Templating* with Angelo Di Iorio, Fabio Vitali. Chapter 34 of *Handbook of research on Web 2.0, 3.0 and x.0: technologies, business and social applications*. San Murugesan Ed., November 2009, ISBN 978-1605663845.

## 6.3 Conference Proceedings

1. *Feature Diagrams as Package Dependencies* with Roberto Di Cosmo. In proceedings of SPLC 2010 (the 14th International Software Product Line Conference), Jeju Island, South Korea, 13-17 September 2010. LNCS 6287, ISBN 978-3-642-15578-9, pp. 476-480, Springer-Verlag, 2010. DOI 10.1007/978-3-642-15579-6\_40.
2. *The Ultimate Debian Database: Consolidating Bazaar Metadata for Quality Assurance and Data Mining* with Lucas Nussbaum. In proceedings of MSR 2010 (the 7th IEEE Working Conference on Mining Software Repositories, co-located with ICSE 2010), IEEE, ISBN 978-1-4244-6802-7, pp. 52-61. 02-03/05/2010, Cape Town, South Africa. DOI 10.1109/MSR.2010.5463277.
3. *Enforcing Type-Safe Linking using Inter-Package Relationships* with Mehdi Dogguy, Stéphane Glondu, Sylvain Le Gall. In proceedings of JFLA 2010 (the 21st Journée Francophones des Langues Applicatifs), pp. 29-54. 30/01-02/02/2010 - La Ciotat, France.
4. *Content Cloaking: Preserving Privacy with Google Docs and other Web Applications* with Gabriele D'Angelo, Fabio Vitali. In proceedings of ACM SAC 2010 (the 25th Annual ACM Symposium on Applied Computing), ISBN 978-1-60558-639-7, pp. 826-830. 22-26/03/2010 - Sierre, Switzerland. DOI 10.1145/1774088.1774259.
5. *Expressing Advanced User preferences in Component Installation* with Ralf Treinen. In proceedings of IWOCE 2009 International Workshop on Open Component Ecosystem, affiliated with ESEC/FSE 2009. Foundations of Software Engineering, ISBN 978-1-60558-677-9, pp. 31-40, ACM 2009. DOI 10.1145/1595800.1595806.
6. *Towards maintainer script modernization in FOSS distributions* with Davide Di Ruscio, Patrizio Pelliccione, Alfonso Pierantonio. In proceedings of IWOCE 2009 International Workshop on Open Component Ecosystem, affiliated with ESEC/FSE 2009. Foundations of Software Engineering, ISBN 978-1-60558-677-9, pp. 11-20, ACM 2009. DOI 10.1145/1595800.1595803.
7. *Strong Dependencies between Software Components* with Pietro Abate, Jaap Boender, Roberto Di Cosmo. In proceedings of ESEM 2009 (3rd International Symposium on Empirical Software Engineering and Measurement), ISBN 978-1-4244-4842-5, pp. 89-99. October 15-16, 2009 - Lake Buena Vista, Florida, USA. DOI 10.1109/ESEM.2009.5316017.
8. *A Model Driven Approach to Upgrade Package-Based Software Systems* with Antonio Cicchetti, Davide Di Ruscio, Patrizio Pelliccione, Alfonso Pierantonio. In proceedings of ENASE 2009 (4th international conference on Evaluation of Novel Aspects to Software Engineering); held in conjunction with ICEIS 2009. 6-10 May 2009, Milan, Italy. CCIS Volume 69, pp. 262-276, Springer-Verlag, 2010. DOI 10.1007/978-3-642-14819-4\_19.

9. *Where are your Manners? Sharing Best Community Practices in the Web 2.0* with Angelo Di Iorio, Davide Rossi, Fabio Vitali. In [proceedings of ACM SAC 2009](#) (the 24th Annual ACM Symposium on Applied Computing). ISBN 978-1-60558-166-8, pp. 681-687 DOI 10.1145/1529282.1529422.
10. *Package Upgrades in FOSS Distributions: Details and Challenges* with Roberto Di Cosmo, Paulo Trenzentes. In proceedings of [HotSWUp'08 \(Hot Topics in Software Upgrades\)](#). October 20, 2008, Nashville, Tennessee, USA. ACM ISBN 978-1-60558-304-4. DOI 10.1145/1490283.1490292.
11. *Wiki Content Templating* with Angelo Di Iorio, Fabio Vitali. In Proceedings of [WWW 2008](#): 17th International World Wide Web Conference. April 21-25, 2008 Beijing, China. ACM 978-1-60558-085-2/08/04, pp. 615-624. DOI 10.1145/1367497.1367581.
12. *Streaming Validation of Schemata: the Lazy Typing Discipline* with Paolo Marinelli, Fabio Vitali. In Proceedings of [Extreme Markup Languages 2007](#): The Markup Theory and Practice Conference. August 7-10, 2007 Montreal, Canada.
13. *Spurious Disambiguation Error Detection* with Claudio Sacerdoti Coen. In Proceedings of [MKM 2007](#): The 6th International Conference on Mathematical Knowledge Management. Hagenberg, Austria – 27-30 June 2007. [LNAI 4573](#), Springer Berlin / Heidelberg, ISBN 978-3-540-73083-5, pp. 381-392, 2007. DOI 10.1007/978-3-540-73086-6\_30.
14. *Co-Constraint Validation in a Streaming Context* with Paolo Marinelli. In Proceedings of [XML 2006](#), "The world's oldest and biggest XML conference". Award: Winner of the [XML Scholarship 2006](#) as best student paper. Boston, MA – December 5-7, 2006.
15. *Crafting a Proof Assistant* with Andrea Asperti, Claudio Sacerdoti Coen, Enrico Tassi. In Proceedings of [Types 2006](#): Types for Proofs and Programs. Nottingham, UK – April 18-21, 2006. [LNCS 4502](#), Springer Berlin / Heidelberg, ISBN 978-3-540-74463-4, pp. 18-32, 2007. DOI 10.1007/978-3-540-74464-1\_2.
16. *Tinycals: Step by Step Tacticals* with Claudio Sacerdoti Coen, Enrico Tassi. In Proceedings of [UITP 2006](#): User Interfaces for Theorem Provers. Seattle, WA – August 21, 2006. [ENTCS \(Elsevier, ISSN 1571-0661\)](#), Volume 174, Issue 2, pp. 125-142 (15 May 2007). DOI 10.1016/j.entcs.2006.09.026.
17. *Constrained Wiki: an Oxymoron?* with Angelo Di Iorio. In Proceedings of [WikiSym 2006](#): the 2006 International Symposium on Wikis. Odense, Denmark – August 21-23, 2006. ACM Press, 2006, ISBN 1-59593-417-0, pp. 89-98. DOI 10.1145/1149453.1149471.
18. *From Notation to Semantics: There and Back Again* with Luca Padovani. In Proceedings of [MKM 2006](#): The 5th International Conference on Mathematical Knowledge Management. Wokingham, UK – August 11-12, 2006. [LNAI 4108](#), Springer Berlin / Heidelberg, ISBN 978-3-540-37104-5, pp. 194-207, 2006. DOI 10.1007/11812289\_16.
19. *A Content Based Mathematical Search Engine: Whelp* with Andrea Asperti, Ferruccio Guidi, Claudio Sacerdoti Coen, Enrico Tassi. In Proceedings of [TYPES 2004](#) conference: Types for Proofs and Programs. Paris, France – December 15-18, 2004. [LNCS 3839](#), Springer Berlin / Heidelberg, ISBN 3-540-31428-8, pp. 17-32, 2006. DOI 10.1007/11617990\_2.
20. *A Generative Approach to the Implementation of Language Bindings for the Document Object Model* with Luca Padovani, Claudio Sacerdoti Coen. In Proceedings of [GPCE'04](#) Third International Conference on Generative Programming and Component Engineering. Vancouver, Canada – October 24-28, 2004 [LNCS 3286](#), Springer Berlin / Heidelberg, ISBN 3-540-23580-9, pp. 469-487, 2004. DOI 10.1007/b101929.

21. *Searching Mathematics on the Web: State of the Art and Future Developments* with Andrea Asperti. In Proceedings of [New Developments in Electronic Publishing AMS/SMM Special Session](#), Houston, May 2004 ECM4 Satellite Conference, Stockholm, June 2004 p. 9-18. FIZ Karlsruhe, ISBN 3-88127-107-4.
22. *Efficient Ambiguous Parsing of Mathematical Formulae* with Claudio Sacerdoti Coen. In Proceedings of [MKM 2004 Third International Conference on Mathematical Knowledge Management](#). September 19-21, 2004 Bialowieza - Poland. [LNCS 3119](#), Springer Berlin / Heidelberg, ISBN 3-540-23029-7, pp. 347-362, 2004.
23. *Brokers and Web-Services for Automatic Deduction: a Case Study* with Claudio Sacerdoti Coen. In Proceedings of [Calculemus 2003 11th Symposium on the Integration of Symbolic Computation and Mechanized Reasoning](#). Roma, Italy – September 10-12, 2003, Aracne Editrice S.R.L. ISBN 88-7999-545-6, pp. 43-57, 2003.

## 6.4 Technical Reports

1. *Strong Dependencies between Software Components* with Pietro Abate, Jaap Boender, Roberto Di Cosmo. [Mancoosi project technical report 0002](#), 22/05/2009.
2. *Metamodel for Describing System Structure and State* with Davide Di Ruscio, Patrizio Pelliccione, Alfonso Pierantonio. [Mancoosi project deliverable, D2.1](#), work package 2. January 2009.
3. *Description of the CUDF Format* with Ralf Treinen. [Mancoosi project deliverable, D5.1](#), work package 5. November 2008.
4. *Stream Processing of XML Documents Made Easy with LALR(1) Parser Generators* with Luca Padovani. Technical report [UBLCS-2007-23](#), September 2007, Department of Computer Science, University of Bologna.
5. *Templating Wiki Content for Fun and Profit* with Angelo Di Iorio, Fabio Vitali. Technical report [UBLCS-2007-21](#), August 2007, Department of Computer Science, University of Bologna.

## 6.5 Dissertations

1. *User Interaction Widgets for Interactive Theorem Proving* with . Ph.D. dissertation, Technical report [UBLCS-2007-10](#), March 2007, Department of Computer Science, University of Bologna (advisor: [Andrea Asperti](#); refereed by: [Christoph Benzmueller](#), [Marino Miculan](#)).
2. *Web services per il supporto alla dimostrazione interattiva (Web services for interactive theorem proving)* with . Master thesis (Italian only), March 2003, Department of Computer Science, University of Bologna (advisor: [Andrea Asperti](#); refereed by: [Nadia Busi](#)).

## 7 Software

Most relevant software of which I have been (co-)author so far:

**2006–2008** [Matita](#)—The Matita proof assistant

**2006-2008** [LablGtkSourceView](#)—OCaml bindings for LablGtkSourceView, a GTK+ source editor

**2002-2008** [LablGtkMathView](#)—OCaml bindings for GtkMathView, a rendering engine for MathML documents

**2002–2008 OCaml HTTP**—an Objective Caml library used to easily write HTTP daemons in both functional and imperative programming style

**2002–2006 UWOBO**—a Web-Service-based XSLT processor, supporting not only the usual single-stylesheet application, but also applications of *stylesheets chains*

**2002–2006 GDome2-XSLT**—a binding to libxslt providing XSLT functionalities on GDome2 documents. C implementation, Objective Caml bindings also available

**2002 talkZ**—a *ntalk* implementation (both client and server) with support for logging and TLS

**2003 CDuce**—CDuce is a general purpose functional programming language, adapted to the manipulation of XML documents. The peculiar features of CDuce include: XML objects, 1st class citizen functions, pattern matching, rich type algebra, UTF-8 support, polymorphism, highly-effective type-driven compilation schema. He implemented and used to maintain XML Schema support in CDuce.

**2001–2009 Debian packages** I took care of the packaging of several software in Debian:

**OCaml related packages:** [calendar](#) (OCaml library providing operations over dates and times), [cameleon](#) (an integrated development environment for OCaml), [camlidl](#) (stub code generator for OCaml), [camlimages](#) (OCaml image processing library), [cryptgps](#) (OCaml library for symmetric cryptographic algorithms), [cryptokit](#) (cryptographic algorithm library for OCaml), [extlib](#) (extended standard library for OCaml), [findlib](#) (management tool for OCaml libraries), [lablgtkmathview](#) (OCaml bindings for gtkmathview), [lablgtksourceview](#) (OCaml bindings for gtksourceview), [mlglade](#) (Glade to OCaml compiler), [mlgmp](#) (OCaml bindings for the GNU multiprecision arithmetic library), [netclient](#) (OCaml HTTP/1.1 and Telnet client library), [numerix](#) (big integer library for OCaml), [ocaml-http](#) (OCaml library for writing HTTP daemons), [ocaml-tools](#) (tools for OCaml programmers), [ocamlnet](#) (OCaml application level Internet protocols libraries), [ocaml-web](#) (literate programming tool for OCaml), [pcre-ocaml](#) (OCaml bindings for the PCRE regexp library), [postgresql-ocaml](#) (OCaml bindings to PostgreSQL's libpq), [pxp](#) (OCaml library implementing an XML-1.0 validating parser), [tuareg-mode](#) (emacs-mode for OCaml programs), [ulex](#) (OCaml lexer generator with Unicode support), [xstr](#) (OCaml library for frequent string operations)

**Vim-related packages:** [vim](#) (Vi IMproved - enhanced vi editor), [vim-scripts](#) (collection of Vim addons), [vim-latexsuite](#) (thorough support for LaTeX inside Vim), [vim-addon-manager](#) (command line manager of Vim addons)

**XML related packages:** [cduce](#) (programming language adapted to the manipulation of XML data), [editex](#) (MathML editor based on TeX syntax), [gdome2-xslt](#) (minimal XSLT processor working on GDome2 documents), [gmetadom](#) (a collection of DOM implementations), [gtkmathview](#) (C++ rendering engine for MathML documents)

**Other packages:** [advi](#) (an active DVI previewer and presenter), [approx](#) (caching proxy server for Debian archive files), [bibtex2html](#) (BibTeX file to HTML), [coq](#) (proof assistant for higher-order logic), [hevea](#) (LaTeX to HTML translator)

## 8 Program Committees

Conferences whose program committee I've chaired:

- ACM SAC 2011 (the 26th Annual ACM Symposium on Applied Computing), Web Technology track

Conferences in which I have been a member of the program committee:

- ACM SAC 2010 (the 25th Annual ACM Symposium on Applied Computing), Web Technology track

## 9 Teaching Experiences

I have been a lecturer or teaching assistants of several courses of the University of Bologna (and affiliated schools):

- 2007–2010** (3 academic years) Teacher of Logica Matematica (Mathematical Logics), Laurea Degree in Applied Computer Science, University of Urbino; on-line program.
- 2006–2008** (2 academic years) Teaching assistant of Logica Matematica (Mathematical Logics), 2nd undergraduate year of Computer Science, University of Bologna.
- 2006–2010** (3 academic years) Lecturer of Laboratorio di Sistemi Informativi (Data Bases and Informative System Laboratory) at Master in Tecnologia del Software Libero e Open Source (1st level master on Free Software and Open Source Technologies), Alma Graduate School, University of Bologna.
- 2005–2007** (3 academic years) Teaching assistant of Programmazione (Programming), 1st undergraduate year of Computer Science (language taught: Java), University of Bologna.
- 2004–2007** (3 academic years) Lecturer of Laboratorio di Sistemi Operativi (Operating System Laboratory) at Master in Tecnologia del Software Libero e Open Source (1st level master on Free Software and Open Source Technologies), Alma Graduate School, University of Bologna.
- 2004/2005** Teaching assistant of Programmazione (Programming), 1st undergraduate year of Computer Science (language taught: Scheme), University of Bologna.
- 2003/2004** Teaching assistant of Programmazione (Programming), 1st undergraduate year of Computer Science (language taught: Java), University of Bologna.

## 10 Job Experiences

- 4 year experience as GNU/Linux system administrator in the *Underlab* (the [Computer Science Department](#) laboratory for undergraduate students at [University of Bologna](#), Italy)
- 1 year experience as GNU/Linux system administrator for [3D automazione](#)
- 3 year experience as computer science teacher for children on the behalf of the [DIRe Project](#)
- 1 year experience as OCaml consultant for [BioMedin](#)
- 1 year experience as PHP developer for [PapiroNet](#)
- 1 year teaching experience of GNU/Linux system administration for an [IFTS](#) course for [COFIMP](#)

## 11 Miscellanea

**2008,2010** Consultant for the publishing house [Il Mulino](#) for the typesetting of books authored with the  $\text{\LaTeX}$  type setting engine

**2002–2008** Founder and member of [Bononia.it](#), Italian non-profit organization for promoting free and open-source software philosophy

**2007–2008** Consultant for [Comune di Bologna](#) for the migration of the information technology infrastructure of the city of Bologna to free and open-source technologies