

Dr. Roberto Bruttomesso
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PERSONAL INFO

First Name: Roberto
Second Name: Bruttomesso
Birth Date: January 8th, 1980
Nationality: Italian
Languages: Italian (native), English (excellent written and spoken)

EDUCATION

2008-Present **PostDoctoral Researcher** at Università della Svizzera Italiana.

- **Work done:** Development of efficient decision procedures for software and hardware verification.
- **Tools Developed:** OpenSMT, An open-source and efficient SMT-Solver.
- **WebPage:** <http://verify.inf.usi.ch/opensmt>.
- **Supervisor:** Prof. Natasha Sharygina.

2004-2008 **PhD in Informatics** from FBK and University of Trento.

- **Thesis:** *RTL Verification: from SAT to SMT(BV)*.
- **Advisors:** Alessandro Cimatti and Prof. Roberto Sebastiani.
- **Final grade:** Ottimo.

1999-2004 **Laurea in Informatica** (5-years MS degree) from Università degli Studi di Milano.

- **Thesis:** Procedure di Combinazione per la Verifica Automatica del Software.
- **Advisor:** Prof. Silvio Ghilardi.
- **Final grade:** 110/110 cum laude.

SUMMER SCHOOLS

- Formal Methods for Hardware Verification, Bertinoro, 2006.
- Scuola Estiva AILA (Associazione Italiana di Logica e sue Applicazioni), Gargnano, 2004.

WORK EXPERIENCE

Jan-Apr 2007 **Internship** at NEC Labs America Inc. of Princeton (NJ).

- **Work done:** Design and implementation of a Simplex-based decision procedure and integration with the verification platform FSOFT.
- **Supervisor:** Dr. Malay Ganai.

May 2005 **Visitor** at INTEL, Haifa.

- **Work done:** Definition of an API interface for benchmarks exchange, jointly with the other members of the teams in Trento and Haifa.

Aug-Nov 2004 **Programmer** at FBK (Foundation Bruno Kessler), Trento.

- **Work done:** Implementation of the tool MathSAT jointly with the other members of the team (<http://mathsat.fbk.eu>).
- **Supervisor:** Alessandro Cimatti.

TALKS AT CONFERENCES AND INSTITUTIONS

- **ICCAD** International Conference of Computer Aided Design, San José, November 2009.
- **SMT** International Workshop on Satisfiability Modulo Theories, Montreal, August 2009.
- **AVM** Alpine Verification Meeting, May 2008.
- **CMU** Carnegie Mellon University, Pittsburg, February 2008.
- **NEC** Nippon Electrical Company, January 2007.
- **CADE** International Conference of Automated Deduction, Tallin, July 2005.

TEACHING EXPERIENCE

Teaching Assistant for the following courses:

- Theory of Computation, USI, Spring 2009.
- Verification and Validation, Alari, Spring 2009.
- Computer Aided Verification, USI, Fall 2008.
- Dependable Computer Systems, Alari, Fall 2008.
- Theory of Computation, USI, Spring 2008.
- Software Verification and Security, USI, Fall 2007.
- Operating Systems, University of Trento, Spring 2007.

PUBLIC SERVICE

Referee for the following conferences and journals:

- Frontiers of Combining Systems, (FROCCOS), 2009.
- Computer Aided Verification (CAV), 2008, 2009.
- Conference on Satisfiability and Testing, (SAT), 2009, 2008, 2006.
- Computer Science Symposium in Russia (CSR), 2009, 2008.
- Conference on Tools and Algorithms for the Construction and Analysis of Systems, (TACAS), 2009, 2006.
- Formal Methods in Computer Aided Design (FMCAD), 2008, 2007, 2006.
- Test and Proofs, (TAP), 2008.

- International SPIN Workshop on Model Checking of Software (SPIN), 2008.
- The International Joint Conference on Automated Reasoning (IJCAR), 2008.
- Conference of Design Automation in Europe, (DATE), 2007.
- Journal of Automated Reasoning (JAR), 2008.
- Journal of Formal Methods in System Design, 2007.

SOFTWARE

- OpenSMT: <http://verify.inf.unisi.ch/opensmt>
- MathSAT: <http://mathsat4.disi.unitn.it>

PUBLICATIONS AND REPORTS

In Conference Proceedings

- [1] M. Bozzano, R. Bruttomesso, A. Cimatti, A. Franzén, Z. Hanna, Z. Kasidashvili, A. Palti, and R. Sebastiani. Encoding RTL constructs for MathSAT: a preliminary report. In *PDPAR'05*, pages 3–14, 2005.
- [2] M. Bozzano, R. Bruttomesso, A. Cimatti, T. Junttila, P. Van Rossum, S. Ranise, and R. Sebastiani. Efficient Satisfiability Modulo Theories via Delayed Theory Combination. In *CAV'05*, pages 335–349, 2005.
- [3] M. Bozzano, R. Bruttomesso, A. Cimatti, T. Junttila, P. Van Rossum, S. Schulz, and R. Sebastiani. An Incremental and Layered Procedure for Satisfiability of Linear Arithmetic Logic. In *TACAS*, pages 317–333, 2005.
- [4] M. Bozzano, R. Bruttomesso, A. Cimatti, T. Junttila, P. Van Rossum, S. Schulz, and R. Sebastiani. The MathSAT 3 System. In *CADE-20*, pages 315–321, 2005.
- [5] R. Bruttomesso. An Extension of the Davis-Putnam Procedure and its Application to Preprocessing in SMT. In *SMT*, 2009.
- [6] R. Bruttomesso, A. Cimatti, A. Franzen, A. Griggio, Z. Hanna, A. Nadel, A. Palti, and R. Sebastiani. A Lazy and Layered SMT(BV) Solver for Hard Industrial Verification Problems. In *CAV*, pages 247–260, 2007.
- [7] R. Bruttomesso, A. Cimatti, A. Franzén, A. Griggio, A. Santuari, and R. Sebastiani. To Ackermann-ize or Not to Ackermann-ize? On Efficiently Handling Uninterpreted Function Symbols in SMT($\mathcal{EUF} \cup \mathcal{T}$). In *LPAR'06*, pages 557–571, 2006.
- [8] R. Bruttomesso, A. Cimatti, A. Franzén, A. Griggio, and R. Sebastiani. Delayed Theory Combination vs. Nelson-Oppen for Satisfiability Modulo Theories: A Comparative Analysis. In *LPAR'06*, pages 527–541, 2006.
- [9] R. Bruttomesso, A. Cimatti, A. Franzén, A. Griggio, and R. Sebastiani. The MathSAT 4 SMT Solver. In *CAV*, pages 299–303, 2008.
- [10] R. Bruttomesso and N. Sharygina. A Scalable Decision Procedure for Fixed-Width Bit-Vectors. In *ICCAD*, 2009.
- [11] Z. Rakamarić, R. Bruttomesso, A. J. Hu, and A. Cimatti. Verifying Heap Manipulating Programs in an SMT Framework. In *ATVA'07*, pages 237–252, 2007.

In Journals

- [12] M. Bozzano, R. Bruttomesso, A. Cimatti, T. Junttila, S. Ranise, P. van Rossum, and R. Sebastiani. Efficient Theory Combination via Boolean Search. *Information Computation*, 204(10):1493–1525, 2006.
- [13] M. Bozzano, R. Bruttomesso, A. Cimatti, T. Junttila, P. van Rossum, S. Schulz, and R. Sebastiani. MathSAT: Tight Integration of SAT and Mathematical Decision Procedures. *JAR*, 35(1-3):265–293, 2005.
- [14] R. Bruttomesso, A. Cimatti, A. Franzen, A. Griggio, and R. Sebastiani. Delayed theory combination vs. Nelson-Oppen for satisfiability modulo theories: a comparative analysis. *Annals of Mathematics and Artificial Intelligence*, 2009.

Other

- [15] R. Bruttomesso. Function Optimization with Genetic Algorithms in Electromagnetics. Survey paper on Genetic Algorithms written as part of PhD course. Trento, May 2005.