

Curriculum Vitae

Constantinos Bartzis

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Research interests

Software and hardware verification. Symbolic and infinite state model checking. BDDs. Automata based symbolic representations. Network security. Decision procedures for propositional and first order logics. Parallel algorithms.

Degrees

Ph.D., Fall 2004, Department of Computer Science, University of California, Santa Barbara, USA.

Thesis: Symbolic Representations for Infinite State Model Checking

Advisor: Tevfik Bultan

B.S./M.S, June 1998, Department of Computer Engineering and Informatics, University of Patras, Greece

Thesis: Experimental Evaluation of Hot-Potato Routing Algorithms on 2-Dimensional Processor Arrays

Advisor: Christos Kaklamanis

Work Experience

Postdoctoral Fellow, Computer Science Department, Carnegie Mellon University, October 2004 -present. Conducted research in the areas of hardware and software model checking, security and boolean satisfiability. Participated in preparation of grant proposals, project reports and teaching.

Research Assistant, Department of Computer Science, University of California, Santa Barbara, June 2000 -September 2004. Designed and implemented efficient data structures and algorithms for infinite state model checking.

Teaching Assistant, Department of Computer Science, University of California, Santa Barbara, September 1998 -June 2000. Courses: Programming Methods in C, Foundations of Computer Science, Introduction to C, C++, and UNIX, Data Structures and Introduction to Algorithms, Data Structures and Algorithms II.

Awards and Grants

- Graduate Division Grant, University of California, Santa Barbara, 2003
- ETAPS Participation Grant, 2003

- UC President's Work Study Research Grant, 2000 -2004
- Fourth prize in the Panhellenic Competition in Physics, 1993
- Third prize in the 9th Balkan Mathematical Olympiad, 1992
- First and second prizes in the Greek Mathematical Olympiads, 1989 -1993

Refereed Conference and Journal Publications

- Constantinos Bartzis, Tamir Heyman and Edmund Clarke. A new parallel SAT algorithm. In preparation.
- Constantinos Bartzis, Stephen Magill and Edmund Clarke. A decision procedure for Separation Logic. In preparation.
- Constantinos Bartzis, Himanshu Jain and Edmund Clarke. Efficient Predicate Abstraction using BDDs. In preparation.
- Vaibhav Mehta, Constantinos Bartzis, Haifeng Zhu, Edmund Clarke and Jeannette Wing. Ranking Attack Graphs. *Proceedings of the 9th International Symposium Recent Advances in Intrusion Detection (RAID 2006)*, volume 4219 of *Lecture Notes in Computer Science*, pages 127-144. Springer 2006.
- Himanshu Jain, Constantinos Bartzis and Edmund Clarke. Satisfiability Checking of Non-clausal Formulae using General Matings. *Proceedings of the 9th International Conference in Theory and Applications of Satisfiability Testing (SAT 2006)*, volume 4121 of *Lecture Notes in Computer Science*, pages 75-89. Springer 2006.
- Constantinos Bartzis and Tevfik Bultan. Efficient BDDs for Bounded Arithmetic Constraints. *International Journal on Software Tools for Technology Transfer (STTT)*, 8(1):26–36, 2006.
- Tuba Yavuz-Kahveci, Constantinos Bartzis and Tevfik Bultan. Action Language Verifier, Extended. *Proceedings of the 17th International Conference on Computer Aided Verification (CAV 2005)*, volume 3576 of *Lecture Notes in Computer Science*, pages 413–417. Springer 2005.
- Constantinos Bartzis and Tevfik Bultan. Widening Arithmetic Automata. *Proceedings of the 16th International Conference on Computer Aided Verification (CAV 2004)*, volume 3114 of *Lecture Notes in Computer Science*, pages 321– 333. Springer, 2004.
- Constantinos Bartzis and Tevfik Bultan. Efficient symbolic representations for arithmetic constraints in verification. *International Journal of Foundations of Computer Science*, 14(4):605–624, 2003.
- Constantinos Bartzis and Tevfik Bultan. Efficient image computation in infinite state model checking. In *Proceedings of the 15th International Conference on Computer Aided Verification (CAV 2003)*, volume 2725 of *Lecture Notes in Computer Science*, pages 249–261. Springer, 2003.
- Constantinos Bartzis and Tevfik Bultan. Construction of efficient BDDs for bounded arithmetic constraints. In *Proceedings of the 9th International Conference on Tools and*

Algorithms for the Construction and Analysis of Systems (TACAS 2003), volume 2619 of *Lecture Notes in Computer Science*, pages 394–408. Springer, 2003.

- Constantinos Bartzis and Tevfik Bultan. Automata-based representations for arithmetic constraints in automated verification. In Jean-Marc Champarnaud and Denis Maurel, editors, *Proceedings of the Seventh International Conference on Implementation and Application of Automata (CIAA 2002)*, volume 2608 of *Lecture Notes in Computer Science*, pages 282–288. Springer, 2003.
- Oscar Ibarra, Jianwen Su, and Constantinos Bartzis. Counter machines and the safety and disjointness problems for database queries with linear constraints. In *Where Mathematics, Computer Science, Linguistics and Biology meet*, pages 127–137. Kluwer Academic Publishers, 2001.
- Constantinos Bartzis, Ioannis Caragiannis, Christos Kaklamanis, and Ioannis Vergados. Experimental evaluation of hot-potato routing algorithms on 2dimensional processor arrays. In *Proceedings of the 6th International Euro-Par Conference*, volume 1900 of *Lecture Notes in Computer Science*, pages 877–881. Springer, 2000.

Software Tools

An automata-based symbolic representation and manipulation package for the **Action Language Verifier** (ALV). ALV is an infinite state CTL symbolic model checker that uses different symbolic representations for different data types.

SatMate. A non-clausal boolean satisfiability (SAT) solver.

Presentations

- **Ranking Attack Graphs**. Presented in the 9th International Symposium in Recent Advances in Intrusion Detection (RAID 2006), Hamburg Germany, September 2006.
- **Non-clausal SAT solving**. Presented in GSRC "System Verification" meeting, IBM Austin TX, December 2005 and ONR MURI Review meeting, Pittsburgh PA, November 2005.
- **Efficient Predicate Abstraction using BDDs**. Presented in ONR MURI Review meeting, Pittsburgh PA, November 2005.
- **Action Language Verifier, Extended**. Presented in the 17th International Conference on Computer Aided Verification (CAV 2005), Edinburgh UK, July 2005.
- **Extending MAGIC with Recursion**. Presented in ONR MURI Review meeting, Arlington VA, February 2005.
- **Widening Arithmetic Automata**. Presented in the 16th International Conference on Computer Aided Verification (CAV 2004), Boston MA, July 2004.

- **Efficient image computation in infinite state model checking.** Presented in the 15th International Conference on Computer Aided Verification (CAV 2003), Boulder CO, July 2003.
- **Construction of efficient BDDs for bounded arithmetic constraints.** Presented in the 9th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS 2003), Warsaw, Poland, April 2003.
- **Automata-based representations for arithmetic constraints in automated verification.** Presented in the 7th International Conference on Implementation and Application of Automata (CIAA 2002), Tours, France, July 2002.

Professional Activities

Program Committee member, Eighth International Conference on Theory and Applications of Satisfiability Testing (SAT 2005).

Organizing Committee member, 8th International Conference on Implementation and Application of Automata (CIAA 2003).

Primary Reviewer: IEEE Transactions on CAD, Computer Standards and Interfaces, Theoretical Computer Science, Information Processing Letters, Formal Aspects of Computing, Eighth International Conference on Theory and Applications of Satisfiability Testing (SAT 2005) and 8th International Conference on Implementation and Application of Automata (CIAA 2003).

Member of the IEEE Computer Society, ACM SIGACT and GSRC.

References

<p>Prof. Edmund Clarke, School of Computer Science, Carnegie Mellon University, 5000 Forbes Avenue, Pittsburgh, PA 15213-3891 Phone: (412) 268-2628 Fax: (412) 268-5576 E-mail: emc@cs.cmu.edu</p>	<p>Prof. Tevfik Bultan, Department of Computer Science, University of California at Santa Barbara, Santa Barbara, California 93106-5110 Phone: (805) 893-3735 Fax: (805) 893-8553 E-mail: bultan@cs.ucsb.edu</p>
<p>Prof. Oscar H. Ibarra, Department of Computer Science, University of California at Santa Barbara, Santa Barbara, California 93106-5110 Phone: (805) 893-4171 Fax: (805) 893-8553 E-mail: ibarra@cs.ucsb.edu</p>	<p>Prof. Jianwen Su, Department of Computer Science, University of California at Santa Barbara, Santa Barbara, California 93106-5110 Phone: (805) 893-3698 Fax: (805) 893-8553 E-mail: su@cs.ucsb.edu</p>