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Education

May 1995	Bachelor of Technology	Computer Science
	Indian Institute of Technology-Kanpur	GPA : 3.92/4.0
Aug 2000	Doctor of Philosophy, PhD	Computer Science
	State University of New York, Stony Brook	GPA : 4.0/4.0

Experience

Staff Scientist : SRI International, 2016–present.

Senior Computer Scientist : SRI International, 2007–2016.

Computer Scientist : SRI International, 2000–2007.

Summer Intern : SRI International, Menlo Park, CA (1999); Bellcore, Piscataway, NJ (1998); Bharath Earth Movers Limited, Bangalore, India (1994); Aeronautical Development Agengy, Bangalore, India (1993).

Research and Teaching Assistant : Department of Computer Science, State University of New York at Stony Brook, 1995–2000.

Honors and Awards

1. National Science Foundation (NSF) awards funding the research proposals "Symbolic techniques for analysis of hybrid systems" (2003), "Little engines of proof" (2003), "Invariants for continuous and hybrid dynamical systems" (2007), "SMT-aware real constraint solving" (2009), "Bounded verification and bounded synthesis" (2010), "Computer-aided synthesis for distributed algorithms" (2014), and "Reinventing formal methods for cyber-physical systems" (2014).
2. National Aeronautics and Space Administration (NASA) award funding the research proposal "Using symbolic constraint solving techniques for analyzing stability properties of adaptive control systems" (2007).
3. Certificate of merit for academic excellence in the core curriculum at the Indian Institute of Technology for the years 1991, 1992 and 1993.
4. Certificate of merit for being among the top 0.1% of successful candidates of All India Senior School Certificate Examination 1991 in Mathematics and Chemistry.

Professional Activities

- Program co-chair for International Joint Conference on Automated Reasoning, IJCAR 2016.
- Program chair for 23rd International Conference on Rewriting Techniques and Applications, RTA 2012.
- Program co-chair for 9th International Workshop on Hybrid Systems: Computation and Control, HSCC 2006.
- Conference Chair for 17th International Conference on Rewriting Techniques and Applications, RTA 2006.
- Program co-chair for the first workshop on "Automated Deduction: Decidability, Complexity, and Tractability", ADDCT 2007 held in conjunction with CADE-21, 2007; First International workshop on "Symbolic and Numeric Methods in Reachability", SNR 2015 helpd in conjunction with CAV 2015; and Fourth edition of the "International Workshop on Confluence", IWC 2015 helpd in conjunction with CADE 2015.

- Member of the program committee for
  - IEEE International Conference on Logic in Computer Science, LICS 2008;
  - International Joint Conference on Automated Reasoning, IJCAR 2004, IJCAR 2008 and IJCAR 2010;
  - EACSL Annual Conference on Computer Science and Logic, CSL 2007;
  - International Conference on Algebraic Biology, AB 2007 and AB 2008;
  - International Conference on Computer-Aided Verification, CAV 2007 and CAV 2011;
  - International Conference on Foundations of Software Technology and Theoretical Computer Science, FST&TCS 2006, FST&TCS 2007 and FST&TCS 2011;
  - International Workshop on Hybrid Systems: Computation and Control, HSCC 2003, HSCC 2005, HSCC 2009, HSCC 2011, HSCC 2012, and 2017;
  - International Conference on Rewriting Techniques and Applications, RTA 2003, RTA 2004, RTA 2006 and RTA 2009;
  - Pragmatics of Decision Procedures in Automated Reasoning, PDPAR 2003 and PDPAR 2006; and Satisfiability Modulo Theories, SMT 2007
  - International Conference on Logic for Programming, Artificial Intelligence, and Reasoning, LPAR 2005;
  - International Conference on Automated Deduction, CADE 2005 and 2017;
  - International Workshop on Frontiers of Combining Systems, FroCoS 2005 and 2017.
  - International Symposum on Reliable Distributed Systems, SRDS 2015.
  - International Conference on Foundations of Software Science and Computation Structures, FoSSaCS 2015.
  - International Conference on Cyber-Physical Systems, ICCPS 2015.
  - International Conference on Principles of Programming Languages, POPL 2016.
- Reviewed papers for SIAM Journal of Computing, Journal of Automated Reasoning (JAR), Transactions on Computational Logic (TOCL), Intl. Conf. on Automated Deduction (CADE), Intl. Conf. on Computer-aided Verification (CAV), Intl. Formal Methods Europe Symposium (FME), Intl. Conf. on Foundations of Software Technology and Theoretical Computer Science (FST&TCS), Intl. Symposium on Formal Techniques in Real-Time and Fault Tolerant Systems (FTRTFT), Intl. Workshop on Frontiers of Combining Systems (FroCoS), Intl. Workshop on Hybrid Systems: Computation and Control (HSCC), Intl. Colloquium on Automata, Languages and Programming (ICALP), IEEE Symposium on Logic in Computer Science (LICS), Intl. Conference on Logic for Programming and Automated Reasoning (LPAR), Intl. Workshop on Pragmatics of Decision Procedures in Automated Reasoning (PDPAR), Intl. Conf. on Rewriting Techniques and Applications (RTA), Conf. on Tools and algorithms for the Construction and Analysis of Systems (TACAS), and Intl. Conf. on Theorem Proving in Higher Order Logics (TPHOLs).
- Invited speaker at the 21st International Conference on Automated Deduction, CADE 2007 and 26th Annual IEEE Symposium on Logic in Computer Science, 2011.
- Presented a Tutorial titled "On Shostak's Combination of Decision Procedures" at the 18th International Conference on Automated Deduction, CADE'02.

Publications

[AT06] A. Abate and A. Tiwari. Box invariance of Hybrid and Switched systems. In *2nd IFAC Conference on Analysis and Design of Hybrid Systems*, pp. 359–364, 2006.

[Aba07] A. Abate, Y. Bai, N. Sznajder, C. Talcott, and A. Tiwari. Quantitative and probabilistic modeling in pathway logic. In *IEEE Conf. BIBE07*, pages 922–929, 2007.

[ATS07] A. Abate, A. Tiwari, and S. Sastry. Box invariance for biologically-inspired dynamical systems. In *Proc. 46th IEEE Conf. on Decision and Control, CDC*, pages 5162–5167, 2007.

[ATS09] A. Abate, A. Tiwari, and S. Sastry. Box invariance in biologically-inspired dynamical systems. *Automatica*, 45(7):1601–1610, July 2009.

[AOT00] R. K. Ahuja, J. B. Orlin, and A. Tiwari. A greedy genetic algorithm for the quadratic assignment problem. *Computers and Operations Research*, 27(10):917–934, September 2000. Preliminary version appeared as a working paper, Sloan School of Management, WP#3826-95, June 1995.

[Ben00] S. Bensalem, et.al. An overview of SAL. In B.L. De Vito, editor, *Langley Workshop on Formal Methods, LFMW 2000*, 2000.

[BRIT99] L. Bachmair, C.R. Ramakrishnan, I.V.Ramakrishnan, and A. Tiwari. Normalization via rewrite closures. In P. Narendran and M. Rusinowitch, editors, *Rewriting Techniques and Applications, RTA 1999*, volume 1631 of *Lecture Notes in Computer Science*, pages 190–204, Trento, Italy, July 1999. Springer-Verlag.

[BRTV00] L. Bachmair, I.V. Ramakrishnan, A. Tiwari, and L. Vigneron. Congruence closure modulo Associativity-Commutativity. In H. Kirchner and C. Ringeissen, editors, *Frontiers of Combining Systems, Third International Workshop, FroCoS 2000*, volume 1794 of *Lecture Notes in Artificial Intelligence*, pages 245–259, Nancy, France, March 2000. Springer-Verlag.

[BT97] L. Bachmair and A. Tiwari. D-bases for polynomial ideals over commutative noetherian rings. In H. Comon, editor, *Rewriting Techniques and Applications, RTA 1997*, volume 1103 of *Lecture Notes in Computer Science*, pages 113–127, Sitges, Spain, July 1997. Springer-Verlag.

[BT00] L. Bachmair and A. Tiwari. Abstract congruence closure and specializations. In D. McAllester, editor, *Conference on Automated Deduction, CADE 2000*, volume 1831 of *Lecture Notes in Artificial Intelligence*, pages 64–78, Pittsburgh, PA, June 2000. Springer-Verlag.

[BTV03] L. Bachmair, A. Tiwari, and L. Vigneron. Abstract congruence closure. *J. of Automated Reasoning*, 31(2):129–168, 2003.

[BRT02] N. Berregeb, R. Robbana, and A. Tiwari. Towards automated proofs of observational properties. *Discrete Mathematics and Theoretical Computer Science*, 6(2):143–162, 2004.

[deM04] L. de Moura, S. Owre, H. Rueß, J. Rushby, N. Shankar, M. Sorea, and A. Tiwari. SAL 2. In R. Alur and D. Peled, editors, *Computer-Aided Verification, CAV*, volume 3114 of *LNCS*, pages 496–500. Springer, July 2004.

[DT13] P. S. Duggirala and A. Tiwari. Safety verification for linear systems. In *ACM/IEEE Intl. Conf. on Embedded Software*, EMSOFT 2013.

[Eke13] S. Eker, M. Krummenacker, A. Shearer, I. Keseler, C. Talcott, A. Tiwari and P. Karp. Computing minimal nutrient sets from metabolic networks via linear constraint solving. BioMed Central BMC Bioinformatics 14:114, 2013.

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[GT14] A. Gascon and A. Tiwari. A Synthesized Algorithm for Interactive Consistency. In NASA Formal Methods, NFM 2014.

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[GLTZ16] S. Ghosh, P. Lincoln, A. Tiwari, and J. Zhu. Trusted machine learning for probabilistic models. In *Reliable Machine Learning in the Wild*, Workshop colocated with ICML 2016.

[GNT02] G. Godoy, R. Nieuwenhuis, and A. Tiwari. Classes of Term Rewrite Systems with Polynomial Confluence Problems. *ACM Transactions on Computational Logic (TOCL)*, 5(2):321–331, April 2004.

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[GT05b] G. Godoy and A. Tiwari. Termination of Rewrite Systems with Shallow Right-Linear, Collapsing, and Right-Ground Rules. In *Intl. Conf. on Automated Deduction*, CADE 2005.

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[ZST12] A. Zutshi, S. Sankaranarayanan, and A. Tiwari. Timed relational abstractions for sampled data control systems. In *Proc. CAV*, volume 7358 of *LNCS*, pages 343–361, 2012.

Dissertation

Title	:	Decision Procedures in Automated Deduction
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