

Ian Wehrman

The University of Texas at Austin
Department of Computer Sciences
1 University Station, C0500
Austin, TX 78712-0233, USA

Phone: (314) 497-6660
Email: iwehrman@cs.utexas.edu
Web: www.cs.utexas.edu/~iwehrman

Research Interests

Concurrent programming language semantics and reasoning.

Education

Ph.D. Computer Science The University of Texas at Austin	<i>in progress</i>
M.Sc. Computer Science Washington University in St. Louis	2006
B.Sc. Computer Science Webster University	2004
Engineering Methods and Tools for Software Safety and Security Marktoberdorf Summer School	2008
Formal Logical Methods for System Security and Correctness Marktoberdorf Summer School	2007

Industrial Experience

Programming Principles Intern Microsoft Research, Cambridge	2008
Software Reliability Intern Microsoft Research, Redmond	2007

Awards & Scholarships

Graduate Professional Development Award The University of Texas at Austin	2008
Student Housing, Participation and Travel Grant Marktoberdorf Summer School	2007
MCD Doctoral Fellowship The University of Texas at Austin	2006
Natural Sciences Dean's Excellence Award The University of Texas at Austin	2006
Student Travel Grant Federated Logic Conference	2006
Graduate Research Assistantship Washington University in St. Louis	2005

Distinguished Master's Fellowship 2004
Washington University in St. Louis

Math & Computer Science Dept. Honors 2004
Webster University

Research Projects

Graphical Models of Separation Logic 2008
A new style of semantics based on separation logic suited to concurrency and weak memory.
Adviser: C. A. R. Hoare

Orc 2006 – 2008
A language for computation orchestration. In particular, a timed semantics and specification logic.
Adviser: Jayadev Misra

HAVOC 2007
Heap-aware automated verification of C programs. In particular, using static types to prove allocatedness assertions and encode nonaliasing assumptions.
Adviser: Shuvendu Lahiri and Shaz Qadeer

Slothrop 2005 – 2006
An automated equational theorem prover based on Knuth-Bendix completion and modern termination checking. First tool to automatically find a completion of the theory of two commuting group endomorphisms.
Adviser: Aaron Stump

Survivable Workflow Transaction Infrastructure 2005 – 2006
A survivable, evolvable computing infrastructure for long-running, critical applications. In particular: extending a Byzantine agreement protocol to support replicated clients and servers.
Adviser: Kenneth J. Goldman

RSP1 2004 – 2005
A novel programming language with dependent types, pattern matching, dependent records and imperative features. In particular: compilation and termination checking.
Adviser: Aaron Stump

The Rogue Validity Checker 2005
A proof-producing, cooperating decision procedure for quantifier-free first-order logic with equality, arrays and linear arithmetic. In particular: finding small conflict sets in a non-clausal setting.
Adviser: Aaron Stump

Papers

Journals

- Ian Wehrman, C. A. R. Hoare, Peter W. O'Hearn. Graphical Models of Separation Logic. Information Processing Letters. (Accepted for publication May, 2009.)
- Ian Wehrman, David Kitchin, William R. Cook and Jayadev Misra. *A Timed Semantics of Orc*. Theoretical Computer Science 402 (2-3), pp. 234-248. 2008.

Conferences

- Sajeewa Pallemulle, Ian Wehrman and Kenneth Goldman. *Byzantine Fault Tolerant Execution of*

Long-Running Distributed Applications. In Proceedings of the 18th IASTED International Conference on Parallel and Distributed Computing and Systems (PDCS 2006).

- Ian Wehrman, Aaron Stump and Edwin Westbrook. *Slothrop: Knuth-Bendix Completion with a Modern Termination Checker*. In Proceedings of the 17th International Conference on Rewriting Techniques and Applications (RTA 2006). pp. 287-296.
- Edwin Westbrook, Aaron Stump and Ian Wehrman. *A Language-based Approach to Functionally Correct Imperative Programming*. 10th ACM SIGPLAN International Conference on Functional Programming (ICFP 2005), pp. 268-279.

Workshops

- Ian Wehrman, David Kitchin, William R. Cook and Jayadev Misra. *A Timed Semantics of Orc (excerpt)*. 2nd Workshop on Event-Based Semantics (WEBS 2008).
- Aaron Stump and Ian Wehrman. *Property Types: Semantic Programming for Java*. 13th International Workshop on Foundations and Developments of Object-Oriented Languages (FOOL/WOOD 2006).
- Ian Wehrman and Aaron Stump. *Mining Propositional Simplification Proofs for Small Validating Clauses*. Third Workshop on Pragmatics of Decision Procedures in Automated Reasoning (PDPAR 2005). ENTCS, Volume 144, Issue 2, 19 January, 2006, pp. 79-91.

Book Chapters

- C. A. R. Hoare, Ian Wehrman, Peter W. O’Hearn. *Graphical Models of Separation Logic*. In “Engineering Methods and Tools for Software Safety and Security.” IOS Press. (To appear, 2009.)

Technical Reports

Ian Wehrman, David Kitchin, William R. Cook and Jayadev Misra. *Properties of the Timed Operational and Denotational Semantics of Orc*. University of Texas at Austin. TR-07-65. December, 2007.

Ian Wehrman. *Knuth-Bendix Completion with Modern Termination Checking*. Master’s thesis, Washington University in St. Louis. WUCSE-2006-45. August, 2006.

Ian Wehrman, Sajeeva Pallemulle and Ken Goldman. *Extending Byzantine Fault Tolerance to Replicated Clients*. WU-CSE-2006-7. February, 2006.

Edwin Westbrook, Aaron Stump and Ian Wehrman. *A Language-based Approach to Functionally Correct Imperative Programming*. WU-CSE-2005-32. July, 2005.

Presentations

Term Rewriting for Fully Automatic Equational Theorem Proving. Two 1-hour talks for the ACL2 Seminar at the University of Texas at Austin. September, 2006.

Slothrop: Completion with Modern Termination Checking. 15-minute system description for RTA 2006 in Seattle, WA. August, 2006.

Completion with Modern Termination Checking. 1-hour Master’s thesis defense at Washington University in St. Louis. July, 2006.

Building Diverse Computer Systems. 1.5-hour lecture for the Survivable Systems Seminar at Washington University in St. Louis. October, 2006.

Mining Propositional Simplification Proofs for Small Validating Clauses. 25-minute talk for the Third Workshop on Pragmatics of Decision Procedures in Automated Reasoning at the University of Edinburgh, Scotland. July, 2005.

A Simple Linear Time $(1 + \epsilon)$ -Approximation Algorithm for k -Means Clustering in Any Dimensions. 2-hour lecture for the Approximation Algorithms seminar at Washington University in St. Louis. April, 2004.

Equational Unification. 1.5-hour lecture for the Equational Theorem Proving seminar at Washington University in St. Louis. March, 2004.

Graduate Coursework

The University of Texas at Austin:

2008 Feature-oriented Programming

2007 Verification and Validation, Model Checking Reactive Systems, Computation Orchestration

2006 Distributed Computing, Introduction to Mathematical Logic, Supervised Teaching in Computer Science

Washington University in St. Louis:

2006 Seminar on Computational Logic: Proof Theory of Arithmetic, Seminar on Computational Complexity Theory (*unofficial*)

2005 Introduction to Automated Theorem Proving, Computational Geometry, Introduction to Formal Languages and Automata, Advanced Data Structures, Seminar on Survivable Systems (*unofficial*), Seminar on Algorithms: Approximation Algorithms, Seminar on Computational Logic: Equational Theorem Proving

2004 Introduction to Artificial Intelligence, Programming Language Theory, Advanced Algorithms

Academic Service

Sub-reviewer:

- 4th International Joint Conference on Automated Reasoning (IJCAR 2008)
- 22nd European Conference on Object-Oriented Programming (ECOOP 2008)
- IARCS Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS 2007)
- 9th International Conference on Coordination Models and Languages (COORD 2007)

Teaching Assistant:

- Computation Orchestration (The University of Texas at Austin)
- Logic, Sets and Functions (The University of Texas at Austin)

Grader:

- Logic & Discrete Mathematics (Washington University in St. Louis)
- Programming Language Theory (Washington University in St. Louis)

Tutor:

- Undergraduate Physics, Math and Computer Science (Webster University)

Miscellaneous

Citizenship: United States of America

Born: June 7, 1980 in St. Louis, Missouri

References: Furnished on request

Last updated: May 25, 2009