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Education

- 2009 **Ph.D.**, *Computer Sciences Dept., University of Wisconsin, Madison.*
Advisor: Professor Thomas W. Reps.
Dissertation: Static Verification of Data-Consistency Properties
- 2004 **M.S.**, *Computer Sciences Dept., University of Wisconsin, Madison.*
- 2001 **B.S.**, *Computer Science, Indiana University, Bloomington.*

Academic Employment

- 2009– **Post-Doctoral Associate**, *Dept. of Computer Science, Purdue University.*
- 2003–2009 **Research Assistant**, *Computer Sciences Dept., University of Wisconsin.*
- 2002–2003 **Research Assistant**, *Computer Sciences Dept., University of Wisconsin.*

Awards and Honors

- 2010 **STTT Invitation**, *VMCAI 2009.*
The paper “Finding Concurrency-Related Bugs using Random Isolation” was invited for submission to a special edition of the STTT journal dedicated to journal versions of the best papers from VMCAI 2009.
- 2009 **STTT Invitation**, *SPIN 2009.*
The paper “A Decision Procedure for Detecting Atomicity Violations for Communicating Processes with Locks” was invited for submission to a special edition of the STTT journal dedicated to journal versions of the best papers from SPIN 2009.

Publications

Journal Publications

- 2010 Kidd, N., Reps, T., Dolby, J., and Vaziri, M., Finding Concurrency Related Bugs using Random Isolation. To appear in *Int. Journal on Software Tools for Technology Transfer* (accepted July 2010, revised September 2010).
- 2010 Kidd, N., Lammich, P., Touili, T., and Reps, T., A Decision Procedure for Detecting Atomicity Violations for Communicating Processes with Locks. To appear in *Int. Journal on Software Tools for Technology Transfer*.

Conference and Refereed Workshop Publications

- 2010 Kidd, N., Jagannathan, S., and Vitek, J., One Stack to Run Them All. In *SPIN Workshop on Model Checking of Software (SPIN)*, September 2010.
- 2009 Harris, W., Kidd, N., Chaki, S., Jha, S., and Reps, T., Verifying Information Flow Control over Unbounded Processes. In *International Symposium on Formal Methods (FM)*, November 2009.
- Kidd, N., Lammich, P., Touili, T., and Reps, T., A Decision Procedure for Detecting Atomicity Violations for Communicating Processes with Locks. In *SPIN Workshop on Model Checking of Software (SPIN)*, June 2009.
- Award:** Invited for submission to a special edition of the *International Journal on Software Tool for Technology Transfer* for the best papers of SPIN 2009.
- Kidd, N., Reps, T., Dolby, J., and Vaziri, M., Finding Concurrency-Related Bugs using Random Isolation. In *Verification, Model Checking, and Abstract Interpretation (VMCAI)*, January 2009.
- Award:** Invited for submission to a special edition of the *International Journal on Software Tool for Technology Transfer* for the best papers of VMCAI 2009.
- 2008 Kidd, N., Lal, A., and Reps, T., Language Strength Reduction. In *Static Analysis Symposium (SAS)*, July 2008.
- Lal, A., Touili, T., Kidd, N., and Reps, T., Interprocedural Analysis of Concurrent Programs Under a Context Bound. In *Tools and Algorithms for the Construction and Analysis of Systems (TACAS)*, April 2008.
- 2007 Lal, A., Kidd, N., Reps, T., and Touili, T., Abstract Error Projection. In *Static Analysis Symposium (SAS)*, August 2007.
- 2006 Chaki, S., Clarke, E., Kidd, N., Reps, T., and Touili, T., Verifying Concurrent Message-Passing C Programs with Recursive Calls. In *Tools and Algorithms for the Construction and Analysis of Systems (TACAS)*, March 2006.
- 2005 Rubin, S., Christodorescu, M., Ganapathy, V., Giffin, J., Kruger, L., Wang, H., and Kidd, N., Anomaly Detection as a Reputation System for Online Auctioning. In *Computer and Communications Security (CCS)*, November 2005.
- Christodorescu, M., Kidd, N., and Goh, W., String Analysis for x86 Binaries. In *Program Analysis for Software Tools and Engineering (PASTE)*, September 2005.
- Balakrishnan, G., Reps, T., Kidd, N., Lal, A., Lim, J., Melski, D., Gruian, R., Yong, S., Chen, C., and Teitelbaum, T., Model checking x86 executables with CodeSurfer/x86 and WPDS++. In *Computer Aided Verification (CAV)*, July 2005.

Invited Papers

Reps, T., Lal, A., and Kidd, N., Program Analysis Using Weighted Pushdown Systems. In *Foundations of Software Technology and Theoretical Computer Science (FSTTCS)*, December 2007.

Technical Reports

2010 Kidd, N., Jagannathan, S., and Vitek, J., One Stack to Run Them All. TR-10-005, Dept. of Computer Science, Purdue University. May 2010.

2009 Kidd, N., Static Verification of Data-Consistency Properties. **Ph.D. Dissertation** and TR-1665, Computer Sciences Dept., Univ. of Wisconsin. November 2009.

Kidd, N., Lammich, P., Touili, T., and Reps, T., A Decision Procedure for Detecting Atomicity Violations for Communicating Processes with Locks. TR-1649, Computer Sciences Dept., Univ. of Wisconsin. April 2009.

2007 Kidd, N., Moore, K., Reps, T., and Wood, D., Towards the Analysis of Transactional Software. TR-1624, Computer Sciences Dept., Univ. of Wisconsin. October 2007.

Kidd, N., Reps, T., Dolby, J., and Vaziri, M., Static Detection of Atomic-Set Serializability Violations. TR-1623, Computer Sciences Dept., Univ. of Wisconsin. October 2007.

Kidd, N., Lal, A., and Reps, T., Advance Queries for Property Checking. TR-1621, Computer Sciences Dept., Univ. of Wisconsin. October 2007.

Lal, A., Touili, T., Kidd, N., and Reps, T., Interprocedural Analysis of Concurrent Programs under a Context Bound. TR-1598, Computer Sciences Dept., Univ. of Wisconsin. July 2007.

Selected Presentations

Conference Talks

Jun. 2009 *A Decision Procedure for Detecting Atomicity Violations for Communicating Processes with Locks.* SPIN, Grenoble, France.

Jan. 2009 *Finding Concurrency-Related Bugs using Random Isolation.* Verification, Model Checking, and Abstract Interpretation (VMCAI), Savannah, Georgia, USA.

Jul. 2008 *Language Strength Reduction.* Static Analysis Symposium (SAS), Valencia, Spain.

Apr. 2006 *Verifying Concurrent Message-Passing C Programs with Recursive Calls.* Tools and Algorithms for the Construction and Analysis of Systems (TACAS), Vienna, Austria.

Sep. 2005 *String Analysis for Binaries.* Program Analysis for Software Tools and Engineering (PASTE), Lisbon, Portugal.

Lectures at Universities and Research Institutes

- Nov. 2009 *Static Verification of Data-Consistency Properties*. Indiana University, Bloomington, USA.
- Nov. 2009 *Software Model Checking*. Purdue University, West Lafayette, Indiana, USA.
- Apr. 2009 *Static Data-Consistency Verification for Concurrent Programs*. GrammaTech, Inc., Ithaca, New York, USA.
- Nov. 2007 *Static Detection of Atomic-Set-Serializability Violations*. LIAFA, Université Paris Diderot - Paris 7, France.
- Jun. 2006 *Verifying Concurrent Message-Passing C Programs with Recursive Calls*. I.B.M. T.J. Watson Research Center, Yorktown Heights, New York, USA.
- Jul. 2005 *Model-Checking Concurrent Message-Passing C Programs with Recursive Calls*. Microsoft Research, Redmond, Washington, USA.

Research Experience

- 2009– **Post-Doctoral Associate**, *Dept. of Comp. Sci., Purdue Univ., W. Lafayette, IN.*
With Professors Vitek and Jagannathan, I showed that for a concurrent program with priority-preemptive scheduling, there is an equivalent *sequential* program. This result enables powerful model checking and verification techniques developed for sequential programs to be applied to a realistic portion of concurrent real-time programs.
- 2003–2009 **Research Assistant**, *Computer Sciences Dept., Univ. of Wisconsin, Madison, WI.*
Under the guidance of Prof. Thomas Reps, my research focused on the analysis of concurrent programs using communicating pushdown systems (CPDSs). I developed the generic weighted pushdown system library WALi, which is a WPDS implementation used by our CPDS model checker. The CPDS model checker has effectively analyzed concurrent Java programs as well as concurrent C programs.
- 2002–2003 **Research Assistant**, *Computer Sciences Dept., Univ. of Wisconsin, Madison, WI.*
Develop a *cyber forensics* tool named C4 with Prof. Bart Miller. C4 permits attaching to a running Linux process, view open file descriptors, and define a custom rule-based authorization policy for restricting the I/O operations that the process can perform.

Professional Activities

- Organizer/Co-organizer
 - May 2010 *Third International School on Trends in Concurrency* at IIIT-Bangalore, Bangalore, India.
 - Apr. 2010 *Transactional Memory Workshop* at Purdue University, West Lafayette, IN.
- External Reviewer
 - 2011 POPL, VMCAI
 - 2010 POPL, PLDI, ICFP, PODC, COORDINATION, PEPM.

2009 POPL, SAS, and CONCUR.

2008 CAV.

2006 CAV.

Research Community Involvement

Sep. 2005 Participated in the 2005 Cyber Trust meeting in Newport Beach, CA.

Other

Nov. 2008 Member of the *Vilas Review Committee* that awards travel grants for dissertation research at the University of Wisconsin.

Member, *Association for Computing Machinery (ACM)*.

Software

N. Kidd, A. Lal, and T. Reps, WALi: The Weighted Automaton Library, 2007. <http://www.cs.wisc.edu/wpis/wpds/download.php>

N. Kidd, T. Reps, D. Melski, and A. Lal, WPDS++: A C++ library for weighted pushdown systems, 2005. <http://www.cs.wisc.edu/wpis/wpds/download.php>

References

References available upon request.