

Christopher L. Conway

January 15, 2011

cconway at cs dot nyu dot edu
<http://www.cs.nyu.edu/~cconway>

Research Interests

The analysis of programs for both bug-finding and verification. Programming language design and domain-specific languages. Using domain-specific information and minimal programmer annotations to improve software reliability and help prove correctness. Verifying compilers and translation validation.

Education

New York University , New York, New York Ph.D., Computer Science, January 2011 Thesis: <i>Tools and Techniques for the Sound Verification of Low Level Code</i> Advisor: Clark Barrett	2006-2010
Columbia University , New York, New York M.Phil, Computer Science, February 2006 M.S., Computer Science, February 2004	2002-2005
The City College of New York , New York, New York Graduate course work, Computer Science	2001-2002
New York University , New York, New York B.A., Computer Science, <i>magna cum laude</i> Awards: Phi Beta Kappa, Computer Science Prize	1995-1999

Research and Work Experience

Google , New York, New York <i>Software Engineer in Test</i>	2010-present
Lucent Bell Laboratories , Murray Hill, New Jersey <i>Software Engineering Intern</i> working with Dennis Dams and Kedar S. Namjoshi Worked on build and release processes for open source release of the ORION static analysis tool.	Summer 2008
Lucent Bell Laboratories , Murray Hill, New Jersey <i>Research Intern</i> working with Dennis Dams and Kedar S. Namjoshi Implemented points-to support for sound static analysis.	Summer 2007
Microsoft Research India , Bangalore, India <i>Research Intern</i> working with Sriram K. Rajamani Designed and implemented CLARITY, a programming language for analyzable concurrent systems code.	Summer 2006
Lucent Bell Laboratories , Murray Hill, New Jersey	Summer 2005

Research Intern working with Dennis Dams and Kedar S. Namjoshi
Implemented an efficient, high-precision buffer overflow analysis for C.

Lucent Bell Laboratories, Murray Hill, New Jersey Summer 2004
Research Intern working with Dennis Dams and Kedar S. Namjoshi
Implemented incremental algorithms for inter-procedural static analysis.

DailyCandy, Inc., New York, New York 2001
Software Development Consultant
Re-architected a high-volume subscription email delivery service in Java, allowing an order-of-magnitude increase in subscribers and mailings.

TMP Worldwide Direct Marketing Interactive, New York, New York 2000-2001
Senior Software Developer
Software team member working on PostalWorks, a high-volume, personalized email service, implemented using distributed Java server processes. Interface work using dynamic HTML and JSP.

Conference Papers

- [1] Christopher L. Conway and Clark Barrett. Verifying low-level implementations of high-level datatypes. In *Computer Aided Verification (CAV)*, Edinburgh, Scotland, July 2010.
- [2] Christopher L. Conway, Dennis Dams, Kedar S. Namjoshi, and Clark Barrett. Pointer analysis, conditional soundness, and proving the absence of errors. In *Static Analysis Symposium (SAS)*, Valencia, Spain, July 2008.
- [3] Prakash Chandrasekaran, Christopher L. Conway, Joseph M. Joy, and Sriram K. Rajamani. Programming asynchronous layers with CLARITY. In *Foundations of Software Engineering (FSE)*, Dubrovnik, Croatia, September 2007. Expanded and revised in Microsoft Research technical report MSR-TR-2007-80.
- [4] Christopher L. Conway, Kedar S. Namjoshi, Dennis Dams, and Stephen A. Edwards. Incremental algorithms for inter-procedural analysis of safety properties. In *Computer Aided Verification (CAV)*, Edinburgh, Scotland, July 2005. Expanded and revised in Columbia University technical report CUCS-018-05.
- [5] Christopher L. Conway and Stephen A. Edwards. NDL: A domain-specific language for device drivers. In *Languages, Compilers, and Tools for Embedded Systems (LCTES)*, Washington, DC, June 2004.

Invited Papers

- [1] Christopher L. Conway and Clark Barrett. Leveraging SMT: Using SMT solvers to improve verification; using verification to improve SMT solvers. In *Usable Verification*, Microsoft Research, Redmond, Washington, November 2010.
- [2] Prakash Chandrasekaran, Christopher L. Conway, Joseph M. Joy, and Sriram K. Rajamani. Verifiable design of asynchronous software. In *Next Generation Design and Verification of Methodologies for Distributed Embedded Control Systems*, Bangalore, India, January 2007.

Talks

<i>Usable Verification Workshop</i> , Redmond, Washington	Nov 2010
<i>Computer-Aided Verification (CAV)</i> , Edinburgh, Scotland	July 2010
<i>Static Analysis Symposium (SAS)</i> , Valencia, Spain	July 2008
<i>Mid-Atlantic Programming Language Seminar</i> , University of Maryland, College Park	Nov 2007
<i>Northeastern Verification Seminar</i> , University of Pennsylvania	Nov 2007
<i>Computer-Aided Verification (CAV)</i> , Edinburgh, Scotland	July 2005
<i>Languages, Compilers, and Tools for Embedded Systems (LCTES)</i> , Washington, D.C.	June 2004
<i>Site visit</i> , IBM T. J. Watson Research Center, Yorktown Heights, NY	May 2004

Teaching

New York University , New York, New York V22.0002: Introduction to Computers & Programming Instructor (10 students)	Summer 2009
Columbia University , New York, New York COMS W4115: Programming Languages and Translators Teaching Assistant	Fall 2005
Columbia University , New York, New York COMS S1007: Introduction to Computer Science Instructor (13 students)	Summer 2003
New York University , New York, New York V22.0102: Introduction to Computer Science II Grader/tutor	Spring 1998
New York University , New York, New York V22.0101: Introduction to Computer Science I Grader/tutor	Fall 1997

Major Projects

Cascade, *Primary developer*, Multi-paradigm, multi-language verification platform (*Java*, 25K LOC)

CVC3, *Contributor*, Theorem prover for “satisfiability modulo theories” problems (C++, >100K LOC)

CVC4, *Core developer*, Blank page rewrite of CVC3 (C++, 15K LOC and growing)

Orion, *Core developer*, Static analysis tool for detecting common bugs in C programs (*OCaml*, 32K LOC)

NDL, *Sole developer*, Compiler for a domain-specific language for Linux device drivers (*SML*, 14K LOC)

Programming Skills

- Expert: OCaml, Java
- Some experience: C, C++, Python, Javascript, Perl, Standard ML, Haskell, Lisp, Debian packaging