JACOB S. BURNIM

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EDUCATION

University of California, Berkeley, Berkeley, CA (2007 --)
   Fifth-year Ph.D. student, Programming Systems (Software Testing and Program Analysis)
   M.S., Computer Science, 2009, G.P.A. 4.00

California Institute of Technology (Caltech), Pasadena, CA (2002 -- 2006)
   B.S., Computer Science and Mathematics, G.P.A. 4.07

PUBLICATIONS

NDSeq: Runtime Checking for Nondeterministic Sequential Specifications of Parallel Correctness
        Jacob Burnim, Tayfun Elmas, George Necula, Koushik Sen
        ACM SIGPLAN Symposium on Programming Language Design and Implementation (PLDI), 2011

Specifying and Checking Semantic Atomicity for Multithreaded Programs
        Jacob Burnim, George Necula, Koushik Sen
        Architectural Support for Programming Languages and Operating Systems (ASPLOS), 2011

Testing Concurrent Programs on Relaxed Memory Models
        Jacob Burnim, Christos Stergiou, Koushik Sen
        International Symposium on Software Testing and Analysis (ISSTA), 2011

Sound and Complete Monitoring of Sequential Consistency for Relaxed Memory Models
        Jacob Burnim, Christos Stergiou, Koushik Sen
        Tools and Algorithms for the Construction and Analysis of Systems (TACAS), 2011

DETERMIN: Inferring Likely Deterministic Specifications of Multithreaded Programs.
        Jacob Burnim, Koushik Sen
        IEEE/ACM International Conference on Software Engineering (ICSE), 2010
        IFIP TC2 Manfred Paul Award for Excellence in Software: Theory and Practice.

Asserting and Checking Determinism for Multithreaded Programs.
        Jacob Burnim, Koushik Sen
        ACM SIGSOFT Symposium on the Foundations of Software Engineering (FSE), 2009.
        Appeared in the June 2010 issue of Communications of the ACM (CACM)
        ACM SIGSOFT Distinguished Paper Award.

WISE: Automated Test Generation for Worst-Case Complexity.
        Jacob Burnim, Sudeep Juvekar, Koushik Sen
        IEEE/ACM International Conference on Software Engineering (ICSE), 2009.

Looper: Lightweight Detection of Infinite Loops at Runtime.
        Jacob Burnim, Nicholas Jalbert, Christos Stergiou, Koushik Sen.
        IEEE/ACM International Conference on Automated Software Engineering (ASE), 2009.

Heuristics for Scalable Dynamic Test Generation (short paper).
        Jacob Burnim, Koushik Sen
        IEEE/ACM International Conference on Automated Software Engineering (ASE), 2008

WORK EXPERIENCE

Research Intern, Microsoft Research -- Summer 2010
Worked with researchers and the SQL Server engineering team to develop novel specification and testing techniques to find and eliminate concurrency errors in the next generation SQL Server storage engine.

Software Engineer, Search Quality, Google -- 8/2006 to 8/2007 (and part-time 8/2007 to 9/2008)
Part of a small team building a large-scale machine learning system for use in Google web search. Experience with machine learning theory and implementation, as well performance tuning and domain-specific languages and compilers.

Software Engineering Intern, Gmail Ads Team, Google -- Summer 2005
Worked on several projects to increase the quality of the targeting of advertising in Gmail. These included developing new Gmail features and improving the infrastructure both for advertisement targeting and to support future efforts to improve advertisement targeting. Work incorporated into two patents.

Research Team Member, Symantec Research Labs, Symantec Corporation -- Summer 2004
Designed and implemented in C++ a modular framework for mining data from large HTTP access logs. Used framework to identify possible cost savings in and to analyze the performance of a world-wide content distribution system. Developed a testing simulation in C++ and statistical model for an enhancement to a spam filtering product.

Research Team Member, Nanosystems Group, MITRE Corporation -- Summers 2000, 2001, 2002
Researched designs for molecular electronic memory and wrote report on feasibility of these nano-scale memories using existing molecular electronic devices. Initiated new research project involving electronic properties of molecular wires, which generated several on-going group research projects and papers.

AWARDS AND HONORS

2011	C.V. Ramamoorthy Distinguished Research Award
2008-11	National Defense Science and Engineering Graduate (NDSEG) Fellowship
2007-08	University of California Regents Fellowship
2002-06	Axline Merit Scholarship (full merit scholarship to Caltech)
2004	Hixon Writing Prize, for best paper in a Caltech introductory humanities course
2004	Seventh place team, ACM International Collegiate Programming Competition (ICPC)
2002	Silver Medal, International Olympiad in Informatics (IOI)
2002	Finalist, Intel Science Talent Search

TEACHING EXPERIENCE

Teaching Assistant (CS 164), UC Berkeley -- 8/2010 to 12/2010
Teaching assistant for Berkeley's upper-division compilers course.

Teaching Assistant (CS 24), Caltech -- 3/2006 to 6/2006
Teaching assistant for Caltech's introductory systems and architecture class.

Programming Team Coach, Caltech -- 9/2004 to 3/2006
For two years, coached Caltech's team for the ACM International Collegiate Programming Contest. Prepared programming problems and short lectures for weekly practices. Raised money and maintained contacts with sponsoring companies. Team reached World Finals both years.

Teaching Assistant (CS 1), Caltech -- 9/2003 to 12/2003
Teaching assistant for Caltech's introductory computer science course (in Scheme).