Chandrasekhar Boyapati

Laboratory for Computer Science
Massachusetts Institute of Technology
200 Technology Square, NE43-631, Cambridge, MA 02139
(617) 253-6031

chandra@lcs.mit.edu
http://cag.lcs.mit.edu/~chandra

Education

09/98 - 12/03 **Massachusetts Institute of Technology (MIT)** **Cambridge, MA**
Doctor of Philosophy in Electrical Engineering and Computer Science, February 2004
Thesis: *SafeJava: A Unified Type System for Safe Programming*
Martin Rinard, advisor

Minor in Approximation Algorithms

09/96 - 08/98 **Massachusetts Institute of Technology (MIT)** **Cambridge, MA**
Master of Science in Electrical Engineering and Computer Science, September 1998
Thesis: *JPS: A Distributed Persistent Java System*
Barbara Liskov, advisor

08/92 - 05/96 **Indian Institute of Technology (IIT)** **Madras, India**
Bachelor of Technology in Computer Science and Engineering, July 1996
Thesis: *Worst Case Efficient Data Structures for Priority Queues and Deques with Heap Order*
C. Pandu Rangan, advisor

Research Interests

My primary research interest is software reliability, which spans the spectrum from programming languages, through program analysis, to software engineering. I am interested in all approaches for helping programmers write and maintain reliable software. I am particularly interested in developing programming languages with strong type systems to improve reliability.

Research Experience

09/00 - 12/03 **Massachusetts Institute of Technology (MIT)** **Cambridge, MA**
Graduate Research Assistant in the Programming Analysis and Compilation Group
Martin Rinard, advisor

09/96 - 05/00 **Massachusetts Institute of Technology (MIT)** **Cambridge, MA**
Graduate Research Assistant in the Programming Methodology Group
Barbara Liskov, advisor

06/00 - 08/00 **Microsoft Research (MSR)** **Redmond, WA**
Research Intern in the Advanced Programming Languages Group
Erik Ruf, mentor

06/99 - 08/99 **Xerox Palo Alto Research Center (PARC)** **Palo Alto, CA**
Research Intern in the Aspect-Oriented Programming Group
Gregor Kiczales, mentor

01/95 - 05/96 **Indian Institute of Technology (IIT)** **Madras, India**
Student Researcher in the Theory Laboratory
C. Pandu Rangan, advisor

Teaching Experience

01/99 - 05/99 **Massachusetts Institute of Technology (MIT)** **Cambridge, MA**
Teaching Assistant for Computer Systems Engineering (6.033)
Frans Kaashoek, lecturer

01/98 - 05/98 **Massachusetts Institute of Technology (MIT)** **Cambridge, MA**
Teaching Assistant for Laboratory in Software Engineering (6.170)
Barbara Liskov and Daniel Jackson, lecturers

08/95 - 11/95 **Indian Institute of Technology (IIT)** **Madras, India**
Teaching Assistant for Introduction to Computing (CS 110)
C. Pandu Rangan, lecturer

Conference Publications

2003 [1] **Lazy Modular Upgrades in Persistent Object Stores**
Chandrasekhar Boyapati, Barbara Liskov, Liuba Shrira, Chuang-Hue Moh, Steven Richman.
ACM Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA), October 2003.

2003 [2] **Ownership Types for Safe Region-Based Memory Management in Real-Time Java**
Chandrasekhar Boyapati, Alexandru Salcianu, William Beebee, Martin Rinard.
ACM Conference on Programming Language Design and Implementation (PLDI), June 2003.

2003 [3] **Ownership Types for Object Encapsulation**
Chandrasekhar Boyapati, Barbara Liskov, Liuba Shrira.
ACM Symposium on Principles of Programming Languages (POPL), January 2003.
This is an invited paper.

2002 [4] **Ownership Types for Safe Programming: Preventing Data Races and Deadlocks**
Chandrasekhar Boyapati, Robert Lee, Martin Rinard.
ACM Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA), November 2002.

2002 [5] **Korat: Automated Testing Based on Java Predicates**
Chandrasekhar Boyapati, Sarfraz Khurshid, Darko Marinov.
ACM International Symposium on Software Testing and Analysis (ISSTA), July 2002.
This paper won an **ACM SIGSOFT distinguished paper award.**

2001 [6] **A Parameterized Type System for Race-Free Java Programs**
Chandrasekhar Boyapati and Martin Rinard.
ACM Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA), October 2001.

Workshop Publications

2002 [7] **Safe Runtime Downcasts With Ownership Types**
Chandrasekhar Boyapati, Robert Lee, Martin Rinard.
ECOOP International Workshop on Aliasing, Confinement and Ownership in Object-Oriented Programming (IWACO), July 2003.

2002 [8] **Safe Concurrent Programming in Java**
Chandrasekhar Boyapati, Robert Lee, Martin Rinard.
MIT LCS/AI Student Oxygen Workshop (SOW), July 2002.

2001 [9] **A Type System for Preventing Data Races**
Chandrasekhar Boyapati and Martin Rinard.
MIT LCS/AI Student Oxygen Workshop (SOW), July 2001.

Technical Reports

2002 [10] **Towards an Extensible Virtual Machine**
Chandrasekhar Boyapati.
Technical Report MIT-LCS-TR-842, Laboratory for Computer Science, MIT, April 2002.

1995 [11] **Relaxed Fibonacci Heaps: An Alternative to Fibonacci Heaps With Worst Case Rather Than Amortized Time Bounds**
Chandrasekhar Boyapati and C. Pandu Rangan.
Technical Report TR-TCS-95-07, Theoretical Computer Science Laboratory, IIT Madras, November 1995.

1995 [12] **On O(1) Concatenation of Deques with Heap Order**
Chandrasekhar Boyapati and C. Pandu Rangan.
Technical Report TR-TCS-95-05, Theoretical Computer Science Laboratory, IIT Madras, March 1995.

Theses

2004 [13] **SafeJava: A Unified Type System for Safe Programming**
Doctor of Philosophy, Electrical Engineering and Computer Science, MIT, February 2004.

1998 [14] **JPS: A Distributed Persistent Java System**
Master of Science, Electrical Engineering and Computer Science, MIT, September 1998.

1996 [15] **Worst Case Efficient Data Structures for Priority Queues and Deques with Heap Order**
Bachelor of Technology, Computer Science and Engineering, IIT Madras, India, May 1996.

Patents

2002 [16] **Aspect-Oriented Programming**
Gregor Kiczales, John Lamping, Cristina Lopes, James Hugunin, Erik Hilsdale, Chandrasekhar Boyapati.
U.S. Patent No. 6,467,086, issued October 2002.

Program Committees

2004 ACM Conference on Programming Language Design and Implementation (PLDI)
2002 MIT LCS/AI Student Oxygen Workshop (SOW)

Refereeing

2004 ACM Symposium on Principles of Programming Languages (POPL)
2003 Journal of Functional Programming (JFP)
2003 ACM Conference on Object-Oriented Programming, Systems, Languages and Applications (OOPSLA)
2003 International Workshop on Aliasing, Confinement and Ownership in object-oriented programming (IWACO)
2003 ACM Symposium on Principles of Programming Languages (POPL)
2002 ACM Conference on Object-Oriented Programming, Systems, Languages and Applications (OOPSLA)
2002 International Static Analysis Symposium (SAS)
2002 MIT LCS/AI Student Oxygen Workshop (SOW)
2002 European Conference on Object-Oriented Programming (ECOOP)

Advising

2002 **M.Eng. Thesis, Massachusetts Institute of Technology (MIT)** **Cambridge, MA**
Along with Martin Rinard, informally co-supervised Robert Lee, a student whose M.Eng. thesis on *Extending the Java Language for the Prevention of Data Races* is related to my Ph.D. thesis

1997 **RSI Summer Research Project, Massachusetts Institute of Technology (MIT)** **Cambridge, MA**
Supervised Athinodoros Panagiotidis, a research intern in the Research Science Institute (RSI) summer program, jointly sponsored by Center for Excellence and Education (CEE) and MIT

Invited Talks

04/2003 **Microsoft Research** **Redmond, WA**
Jim Larus, host

04/2003 **University of Massachusetts at Amherst** **Amherst, MA**
Lori Clarke, host

04/2003 **Rice University** **Houston, TX**
Keith Cooper, host

04/2003 **University of Chicago** **Chicago, IL**
David MacQueen, host

04/2003 **University of California at San Diego** **San Diego, CA**
Brad Calder, host

03/2003 **IBM T. J. Watson Research Center** **Yorktown Heights, NY**
David Bacon, host

03/2003 **University of Michigan at Ann Arbor** **Ann Arbor, MI**
Brian Noble, host

11/2002 **Microsoft Research** **Redmond, WA**
Jim Larus, host

02/2002 **New England Programming Languages and Systems Symposium (NEPLS)** **Cambridge, MA**
Michael Ernst, chair

10/2001 **Church Seminar, Boston University** **Boston, MA**
Assaf Kfoury, host

Honors

2002 ACM SIGSOFT distinguished paper award [5].

1996 Gordon Wu Fellowship, Princeton's most prestigious award for graduate study in engineering. Declined.

1992 Ranked 11^{th} out of over 100,000 students in the All India Joint Entrance Examination for admission to IITs.

1992 Ranked among the top 20 out of over 400,000 students in the West Bengal Higher Secondary Examination.

1992 Recipient of National Talent Search Scholarship awarded to top 0.5% of over 150,000 students, based on a nationwide test conducted by the National Council of Educational Research and Training (NCERT), India.

1988 & 1989 Got the top rank among nearly 20,000 students in the Science Aptitude and Talent Search Test conducted by All India Science Teachers Association, West Bengal branch, both in 1988 and 1989.