

Brian F. Cooper

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INTERESTS

Distributed systems, digital libraries, and database systems

EDUCATION

Ph.D. in Computer Science, 2003

Stanford University, Stanford, California
Advisor: Professor Hector Garcia-Molina

M.S. in Computer Science, 2000

Stanford University, Stanford, California

B.S. in Computer Science (with Highest Honors), 1998

B.A. in Chemistry, 1998

University of Colorado, Boulder, Colorado

HONORS

- Outstanding School of Engineering Graduate, University of Colorado – Awarded to the top student in a graduating class for exceptional academic achievement, 1998
- Boettcher Scholar – Awarded to forty top Colorado college students, 1993-1997
- National Merit Scholar – Awarded to outstanding students on the basis of academic achievement – 1993

RESEARCH

Stanford University

Stanford, California

September 1998 – present

Research Assistant in the Department of Computer Science

Archival Repository Project

- Designed and implemented the Stanford Archival Vault, a highly reliable digital archiving system
- Designed and implemented the InfoMonitor, a tool for automatically and transparently archiving filesystem or web-server data
- Developed Data Trading, a technique for distributed storage resource allocation for a network of autonomous sites cooperating to provide digital archiving through replication
- Developed Bid Trading, an extension of Data Trading which utilizes auctions and bidding for distributed resource allocation and negotiation
- Developed the Search/Index Links (SIL) model for visualizing and studying peer-to-peer search networks that are both efficient and fault tolerant
- Examined Parallel Search Clusters, a novel peer-to-peer search architecture that was derived from analysis of the SIL model

IBM Almaden Research Center

San Jose, California

July – October 2002

Research Intern in the Database Technology Institute

Worked on integrating SOAP requestor capabilities into the DB2 database engine

- Implemented features and enhanced stability for SOAP requestor user defined

function

- Implemented SOAP requestor as a built in function of the DB2 engine
- Conducted performance studies of SOAP request/response and identified optimizations for latency reduction

RightOrder Inc.

San Jose, California

September 2000 – June 2002

Research Engineer in CTO group

Developed new algorithms and techniques for extensible data management

- Developed Raw Paths and Refined Paths, techniques for indexing XML data paths using a compressed Patricia Trie index, which provide significantly faster query processing than existing techniques for several query types
- Studied techniques for parallelizing XML indexing to provide high throughput
- Examined Extensible Middle-Tier Data Management techniques for providing scalable, extensible data management for multi-tier applications and integrated database back-ends

IBM T.J. Watson Research Center

Hawthorne, New York

May –August 1998

Research Intern in the Programming Technologies Department

Developed program profiling techniques for an adaptive Java compiler

- Designed and implemented run-time program profiler for an adaptive Java compiler
- Implemented program profile data structure based on calling context tree

University of Colorado

Boulder, Colorado

September 1997 – May 1998

Undergraduate researcher in the Department of Computer Science

Compiler Optimization Group

- Developed ProfBuilder, a package for rapid construction of runtime Java program profilers
- Designed and implemented program analysis tools based on dynamic construction of calling context tree and control flow graph structures
- Developed memory allocation and instruction count profilers for optimizing memory consumption and execution time
- Used these profiling and analysis tools to study dynamic behavior of Java applications

TEACHING

Stanford University

Stanford, California

Spring, 2000

Teaching Assistant for Introduction to Databases

Delivered several lectures, conducted problem sessions and review sessions, helped prepare exams, and worked one-on-one with students

Stanford University

Stanford, California

Winter, 2002

Teaching Assistant for Database System Principles

Delivered several lectures, conducted review sessions, prepared assignments, helped prepare exams, and worked one-on-one with students

Stanford University

Stanford, California

Fall 2000 – present

Supervised master's degree students working on research projects for the Archival Repository Project

University of Colorado

Boulder, Colorado

January – December 1995

Residence Hall Academic Program Tutor

Tutored students both in small group settings and as leader of a walk-in help lab

COMMUNITY

PhD bureaucrat, Stanford Department of Computer Science, 1999

- Represented graduate student interests at department meetings

Stanford Local Programming Contest Coordinator, 1998-2002

- Constructed programming problems, ran contest and scored solutions

Reviewer

- JCDL 2001, VLDB 2002, ACM SAC 2002, HPDC 2003, Software Practice and Experience 2003

REFERENCES

Professor Hector Garcia-Molina

Department of Computer Science, Stanford University

Gates Hall 434

Stanford, California 94305

Email: siroker@db.stanford.edu

Phone: (650) 723-0685

Professor Michael Franklin

Computer Science Division, University of California at Berkeley

687 Soda Hall #1776

Berkeley, California 94720

Email: franklin@cs.berkeley.edu

Phone: (510) 642-1662

Dr. Andreas Paepcke

Department of Computer Science, Stanford University

Gates Hall 426

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Professor Jennifer Widom

Department of Computer Science, Stanford University

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Email: siroker@db.stanford.edu

Phone: (650) 723-7690

PUBLICATIONS

Copies of publications are available from <http://www.stanford.edu/~cooperb/app/>

Papers in Journals

1. Brian F. Cooper and Hector Garcia-Molina. Peer-to-peer resource trading to preserve information. *ACM Transactions on Information Systems (TOIS)*, 20(2), April 2002.
2. Brian F. Cooper, Neal Sample, Michael J. Franklin, Joshua Olshansky and Moshe Shadmon. Middle-Tier Extensible Data Management. *World Wide Web Journal*, 4(3), 2001.
3. Brian F. Cooper, Arturo Crespo and Hector Garcia-Molina. The Stanford Archival Repository Project: Preserving our digital past (Invited paper). *Library and Information Research News*, to appear.
4. Brian F. Cooper and Hector Garcia-Molina. InfoMonitor: Unobtrusively archiving a World Wide Web server. *International Journal on Digital Libraries*, to appear.

Papers in conferences and workshops

5. Brian F. Cooper and Hector Garcia-Molina. Studying search networks with SIL. In *Proceedings of the 2nd International Workshop on Peer-to-Peer Systems (IPTPS)*, Berkeley, California, 2003.
6. Brian F. Cooper and Hector Garcia-Molina. Bidding for storage space in a peer-to-peer data preservation system. In *Proceedings of the 2002 International Conference on Distributed Computing Systems (ICDCS)*, Vienna, Austria, July 2002.
7. Brian F. Cooper and Hector Garcia-Molina. Peer-to-peer resource trading in a reliable distributed system. In *Proceedings of the 1st International Workshop on Peer-to-Peer Systems (IPTPS)*, Boston, Massachusetts, March 2002.
8. Brian F. Cooper, Neal Sample, Michael J. Franklin, Joshua Olshansky and Moshe Shadmon. Extensible data management in the middle tier. In *Proceedings of the 2002 Research Issues in Data Engineering Workshop*, San Jose, California, March 2002.
9. Brian F. Cooper, Neal Sample and Moshe Shadmon. A parallel index for semistructured data. In *Proceedings of the 2002 ACM Symposium on Applied Computing (SAC)*, Madrid, Spain, March 2002.
10. Brian F. Cooper, Neal Sample, Michael J. Franklin, Gisli R. Hjaltason and Moshe Shadmon. A fast index for semistructured data. In *Proceedings of the 2001 Conference on Very Large Databases (VLDB)*, Rome, Italy, September 2001.
11. Brian F. Cooper and Hector Garcia-Molina. Creating trading networks of digital archives. In *Proceedings of the Joint ACM/IEEE Conference on Digital Libraries (JCDL)*, Roanoke, Virginia, June 2001.
12. Brian F. Cooper, Arturo Crespo and Hector Garcia-Molina. Implementing a reliable digital object archive. In *Proceedings of the 2000 European Conference on Digital Libraries (ECDL)*, Lisbon, Portugal, September 2000.

Papers submitted for publication

13. Brian F. Cooper and Hector Garcia-Molina. Ad hoc, self-supervising peer-to-peer search networks. Technical Report, Stanford University, 2003.
14. Brian F. Cooper and Hector Garcia-Molina. SIL: Modeling and measuring scalable peer-to-peer search networks. Technical Report, Stanford University, 2003.

Dissertation

15. Brian F. Cooper. Information Preservation in Networks of Autonomous Archives. Ph.D. Dissertation, Stanford University, June 2003.

Technical reports

16. Brian F. Cooper, Mayank Bawa, Neil Daswani and Hector Garcia-Molina. Protecting the PIPE from malicious peers. Stanford University Technical Report, 2002.

17. Brian F. Cooper, Han B. Lee and Benjamin G. Zorn. ProfBuilder: A package for rapidly building Java execution profilers. University of Colorado Technical Report, 1998.