

Neha Narula

32 Vassar St. G980
Cambridge, MA 02139

narula@gmail.com
http://nehanaru.la

INTERESTS Distributed systems, storage, distributed databases, frameworks for mobile and web applications.

EDUCATION **Massachusetts Institute of Technology** Cambridge, MA
Ph.D. in Computer Science September 2010 – June 2015

Advisors: Robert T. Morris and Eddie Kohler
Thesis: *Parallel Execution for Conflicting Transactions*

Massachusetts Institute of Technology Cambridge, MA
M.S. in Computer Science January 2008 – September 2010

Advisor: Robert T. Morris.
Thesis: *Distributed Query Execution on a Replicated and Partitioned Database*

Dartmouth College Hanover, NH
B.A. in Computer Science and B.A. in Mathematics September 1999 – June 2003

Advisor: Prasad Jayanti
Thesis: *Eliminating Complex Synchronization Instructions in the Contention-Free Case for Mutual Exclusion Algorithms*

RESEARCH MIT CSAIL Cambridge, MA
EXPERIENCE *Research Assistant in PDOS* January 2008 – May 2015

Doppel. Doppel is an in-memory multi-core transactional database designed to improve performance on workloads with many conflicting transactions. We developed a new technique called phase reconciliation; we take advantage of commutativity and executing transactions in explicit phases in order to increase concurrency. Doppel provides a dramatic performance improvement over existing concurrency control algorithms (3-30×) on highly conflicting workloads.

Pequod. Pequod is an in-memory distributed caching layer which can automatically materialize and update the results of simple joins. It simplifies programs which manually perform incremental updates to cached objects, like Twitter timelines, while beating the performance of in-memory key-value caches like Redis and memcached.

Dixie. Dixie is a SQL query planner, optimizer, and executor which issues SQL queries written for one database over a database sharded and replicated over multiple servers. Dixie focuses on increasing inter-query parallel speedup and throughput by using table replicas to involve fewer servers in each query, and simplifies the process of moving an application from a single database to a sharded database.

BFlow. BFlow is a browser extension and server-side component which tracks confidential data as it flows within the browser. BFlow allows users to run untrusted javascript which can compute with, render, and store confidential data without being able to leak it.

PROFESSIONAL News.me/Digg New York, NY
EXPERIENCE *Data Scientist* June 2012 – August 2012

Member of the five-person engineering team which launched the new Digg.com in six weeks.

Designed and implemented a system for analyzing shared content on Twitter and Facebook, and using these and other signals generated trending, new, and breaking news. Currently used on Digg.com.

Google, Inc.
Senior Software Engineer

Mountain View, CA
July 2003 – January 2011

Designed and developed a Linux security sandbox for untrusted code running in the Native Client framework. Helped launch the research prototype of Native Client.

Designed and developed a highly available, distributed storage and serving system for large binary objects with five other engineers. Launched and maintained the system while supporting several production applications and serving gigabits of traffic per second.

Launched Froogle, Google's shopping website, into two new countries.

Led the verification of the transition of Google's entire billing system to a new vendor.

Developed the first system integration test bed for the ads backend serving system.

CONFERENCE
PUBLICATIONS

Narula, N., Cutler, C., Kohler, E. and R. Morris. *Phase Reconciliation for Contended In-memory Transactions*. In OSDI. Broomfield, Colorado, 2014.

Kate, B., Kohler, E., Kester, M., **Narula, N.**, Mao, Y., and R. Morris. *Easy Freshness with Pequod Cache Joins*. In NSDI. Seattle, Washington, 2014.

Narula, N. and R. Morris. *Executing Web Application Queries on a Partitioned Database*. In USENIX Webapps. Boston, Massachusetts, 2012.

Chandra, R., Kim, T., Shah, M., **Narula, N.** and N. Zeldovich. *Intrusion Recovery for Database-backed Web Applications*. In SOSp. Cascais, Portugal, 2011.

Yee, B., Sehr, D., Dardyk, G., Chen, J.B., Muth, R., Ormandy, T., Oksaka, S., **Narula, N.**, and N. Fullagar. *Native Client: A Sandbox for Portable, Untrusted x86 Native Code*. In IEEE Symposium on Security and Privacy. Oakland, California, 2010. **Best Paper Award**

Yip, A., **Narula, N.**, Krohn, M. and R.T. Morris. *Privacy-Preserving Browser-Side Scripting with BFlow*. In Eurosys. Nuremberg, Germany, 2009.

Jayanti, P., Petrovic, S. and **N. Narula**. *Read/Write Based Fast-Path Transformation for FCFS Mutual Exclusion*. In SOFSEM: Theory and Practice of Computer Science. Springer, 2005.

POSTERS AND
ABSTRACTS

Narula, N. *A Multi-core Database is not a Distributed System*. In CIDR. Asilomar, California, 2015.

Narula, N. and R. Morris. *Designing a Toolkit for Distributed Storage in Web Applications*. Poster at SOSp. Big Sky, Montana, 2009.

TALKS

Splitting and Replicating Data for Fast Transactions: Don't Give Up on Serializability Just Yet

CRAFT, Budapest, Hungary.
GOTO Chicago, Chicago, IL.

April 2015
April 2015

	Papers We Love: The Scalable Commutativity Rule Papers We Love, New York, NY.	April 2015
	A Multi-core Database Is Not a Distributed System CIDR short talk, Asilomar, CA.	January 2015
	Phase Reconciliation for Contended In-Memory Transactions RICON, Las Vegas, NV. OSDI, Broomfield, CO. MIT Industry Affiliate Program Cloud Workshop, Cambridge, MA.	October 2014 October 2014 September 2014
	Consensus and Consistency: Why Should I Care? Berlin Buzzwords, Berlin, Germany.	May 2014
	The Good, the Bad, and the Ugly (of Caching) All Your Base (keynote), Oxford, UK.	October 2013
	Smarter Caching With Pequod RICON East, New York, NY.	May 2013
	Executing Queries on a Sharded Database Future of Webapps, Las Vegas, NV. Future Insights Live, London, UK. Strangeloop, St. Louis, MO. Hacker School, New York, NY. USENIX Webapps, Boston, MA.	October 2013 May 2013 September 2012 August 2012 June 2012
SERVICE	Resident at Hacker School MIT EECS Faculty Search Student Subcommittee Leading MIT's distributed systems reading group Mentor for the NYUAD Hackathon for Social Good in the Arab World Mentor for an undergraduate MIT student Mentor for three new hires at Google Member of the Google Mentoring Committee Member of the Google Foundation Steering Committee	April 2015 Spring 2015 2014-2015 April 2013 2010 2003-2008 2006-2008 2003
TEACHING	Distributed Systems (6.824) Teaching Assistant Guest lecturer	Spring 2013
	Computer Systems Engineering (6.033) Teaching Assistant	Spring 2011
PRESS	BostonInno.com. <i>2015: The Year Women Take Back Tech</i> Wired.com. <i>MIT Computer Scientists Demonstrate the Hard Way That Gender Still Matters</i> Reddit.com. <i>We're 3 Female Computer Scientists from MIT. Ask us anything!</i>	
HONORS AND AWARDS	Eben Tisdale Fellowship (declined) NSF Graduate Research Fellowship High Honors in Computer Science Inducted into Sigma Xi 2nd place at the Christopher Reeves Science Competition	2009 2007 2003 2003 2003

REFERENCES

Robert T. Morris

Professor, Department of Electrical Engineering and Computer Science
Massachusetts Institute of Technology
rtm@csail.mit.edu

Eddie Kohler

Associate Professor, School of Engineering and Applied Sciences
Harvard University
kohler@seas.harvard.edu

Barbara Liskov

Institute Professor, Department of Electrical Engineering and Computer Science
Massachusetts Institute of Technology
liskov@piano.csail.mit.edu

Sharon Perl

Staff Software Engineer
Google, Inc.
sharon@google.com