

# Stacy Patterson

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## RESEARCH INTERESTS

Design and analysis of dynamical systems models and algorithms for complex networks. Application contexts include information dynamics in social networks, estimation and control in sensor networks, and distributed storage and processing systems.

## EDUCATION

- 06/2009 **Ph.D. Computer Science**  
**University of California, Santa Barbara**, Santa Barbara, CA  
Advisor: Amr El Abbadi, Dissertation: Design and Analysis of Algorithms for Large-Scale Distributed Systems: A Control Theoretic Approach
- 06/2003 **M.S. Computer Science**  
**University of California, Santa Barbara**, Santa Barbara, CA
- 05/1998 **B.S. Computer Science, B.A. Mathematics**  
**Rutgers University**, New Brunswick, NJ

## RESEARCH EXPERIENCE

- 07/2009 – **Postdoctoral Scholar**, Center for Control, Dynamical Systems, and Computation  
*Present* **University of California, Santa Barbara**, Santa Barbara, CA  
Supervisor: Bassam Bamieh  
Current research projects include:
- Design and analysis of models for opinion and information dynamics in complex networks, and development of algorithms for shaping and altering these dynamics.
  - Tomographic sensing with ultrasonic transceivers, for generation of 3-dimensional maps of temperature, air flows, and chemical clouds.
  - Development of models and tools for formal verification of data and transaction consistency in cloud data stores.
- 07/2007 – **Graduate Research Assistant**, Department of Computer Science  
03/2009 **University of California, Santa Barbara**, Santa Barbara, CA  
Supervisor: Amr El Abbadi

## PROFESSIONAL EXPERIENCE

- 11/2000 – **Senior Software Engineer, Technical Project Manager**  
08/2004 **Commission Junction, a ValueClick company**, Santa Barbara, CA
- Project manager of the internationalization of the Commission Junction J2EE web application. Architected software solutions for internationalization and localization and managed team of six engineers in implementation and deployment.
  - Implemented libraries and frameworks for guiding the direction of the code base, including unit testing, transaction handling, logging, and persistence management.
  - Responsible for peer code review and mentoring of junior engineers.
- 1998 – **Software Engineer**  
2000 New York, NY and Santa Barbara, CA
- Designed and implemented web applications in Java and Perl.
  - Responsible for Linux system administration and Oracle database administration.

## TEACHING EXPERIENCE

- 02/2010 – **Instructor**, The Gevirtz Graduate School of Education  
Present **University of California, Santa Barbara**, Santa Barbara, CA
- Part of an NSF Course, Curriculum, and Laboratory Improvement grant to revise, implement, and research pedagogically innovative undergraduate courses on the environment and sustainability, aimed to recruit and prepare STEM students for careers in secondary science and mathematics education.
  - Responsible for the development of an undergraduate course on green technologies, cross-listed in Education and Environmental Studies, which I will co-teach in Spring 2011.
- 04/2009 – **Teaching Associate**, Department of Computer Science  
06/2009 **University of California, Santa Barbara**, Santa Barbara, CA
- Instructor for CS 5JA: Introduction to Computer Programming in Java, class size of 94 students with 3 teaching assistants.
- 09/2005 – **Teaching Assistant**, Department of Computer Science  
03/2009 **University of California, Santa Barbara**, Santa Barbara, CA
- Responsible for seven Computer Science courses including Advanced Topics in Database Systems (graduate course), Advanced Topics in Distributed Systems (graduate course), and Foundations of Computer Science (lower division course).
- 09/2007 – **INSCITES Graduate Teaching Scholar**  
06/2008 **California NanoSystems Institute, UC Santa Barbara**, Santa Barbara, CA
- Jointly responsible, with two other graduate scholars, for the development and teaching of an interdisciplinary, undergraduate course on the science, economics, history, and sociology of innovative green technologies.
  - Received training in curriculum development, novel pedagogical methods, and evaluation.

## JOURNAL ARTICLES

Bassam Bamieh, Mihailo Jovanović, Partha Mitra, and **Stacy Patterson**: Coherence in Large-Scale Networks: Dimension Dependent Limitations of Local Feedback. *IEEE Transactions on Automatic Control*, 2010 (accepted for publication).

**Stacy Patterson**, Bassam Bamieh, and Amr El Abbadi: Convergence Rates of Distributed Average Consensus with Stochastic Link Failures. *IEEE Transactions on Automatic Control*, April 2010.

Meredith Murr, **Stacy Patterson**, Evelyn Hu, Fiona Goodchild, and Patrick McCray: From the Ground Up: Developing an Interdisciplinary Course Focusing on Materials Science and Society in Green Technologies. *Journal of Materials Education*, December 2009.

## CONFERENCE AND WORKSHOP PUBLICATIONS

**Stacy Patterson** and Bassam Bamieh: Leader Selection for Optimal Formation Coherence. *49<sup>th</sup> IEEE Conference on Decision and Control (CDC)*, December 2010.

**Stacy Patterson** and Bassam Bamieh: Convergence Rates of Consensus Algorithms in Stochastic Networks. *49<sup>th</sup> IEEE Conference on Decision and Control (CDC)*, December 2010.

**Stacy Patterson** and Bassam Bamieh: Interaction-Driven Opinion Dynamics in Online Social Networks. *First Workshop on Social Media Analytics with KDD*, July 2010.

Bassam Bamieh, Mihailo Jovanović, Partha Mitra, and **Stacy Patterson**: Effect of Topological

Dimension on Rigidity of Vehicle Formations: Fundamental Limitations of Local Feedback. *47<sup>th</sup> IEEE Conference on Decision and Control (CDC)*, December 2008.

**Stacy Patterson**, Bassam Bamieh, and Amr El Abbadi: Using Tomography for Ubiquitous Sensing. *16<sup>th</sup> ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM GIS)*, November 2008.

**Stacy Patterson** and Bassam Bamieh: Distributed Consensus with Link Failures as a Structured Stochastic Uncertainty Problem. *46<sup>th</sup> Annual Allerton Conference on Communication, Control, and Computing*, September 2008.

**Stacy Patterson**, Bassam Bamieh, Amr El Abbadi, and Mihailo Jovanović: On the Feasibility of Large-Scale Automated Highways. *First International Workshop on Computational Transportation Science*, July 2008 (invited paper).

**Stacy Patterson**, Bassam Bamieh, and Amr El Abbadi: Environmental Tomography: Ubiquitous Sensing with Mobile Devices. *24<sup>th</sup> International Conference on Database Engineering (ICDE)*, April 2008 (demonstration).

**Stacy Patterson**, Bassam Bamieh, and Amr El Abbadi: Distributed Average Consensus with Stochastic Communication Failures. *46<sup>th</sup> IEEE Conference on Decision and Control (CDC)*, December 2007.

**Stacy Patterson**, Bassam Bamieh, and Amr El Abbadi: Brief Announcement: Convergence Analysis of Scalable Gossip Protocols. *20<sup>th</sup> International Symposium on Distributed Computing (DISC)*, September 2006.

Achour Mostefaoui, Michel Raynal, Corentin Travers, **Stacy Patterson**, Divyakant Agrawal, and Amr El Abbadi: From Static Distributed Systems to Dynamic Systems. *24<sup>th</sup> IEEE Symposium on Reliable Distributed Systems (SRDS)*, October 2005.

**Stacy Patterson**, Divyakant Agrawal, and Amr El Abbadi: Guaranteeing Correctness of Lock-Free Range Queries over P2P Data. *Third International Workshop on Databases, Information Systems and Peer-to-Peer Computing (DBISP2P) with VLDB*, August 2005.

## HONORS AND AWARDS

Visiting Scholar, Lund Center for Control of Complex Engineering Systems, 02/2010

INSCITES Graduate Teaching Scholar Fellowship, 2007 – 2008

Outstanding Teaching Assistant, Fall 2005, Fall 2006, Winter 2009

Grace Hopper Celebration of Women in Computing Scholarship, 10/2006

UC Santa Barbara Computer Science Departmental Fellowship, 2004 – 2005

## ACADEMIC SERVICE

**Technical Reviewer:** SIGMOD, VLDB, ICDT, ICDE, EDBT, ICDCS, PODS, SSTD, CIKM, SSDBM, CDC, LADIS, NecSys, CDC, ACC, IFAC World Congress, ACM Transactions on Computer Systems, IEEE Transactions on Automatic Control, Automatica

**Program Committee:** Second International Workshop on Computational Transportation Science, 2009

**Professional Memberships:** IEEE, ACM, SIGCSE