

# Bobak Nazer

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## CONTACT INFORMATION

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Department of EECS  
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## EDUCATION

**University of California, Berkeley** (Berkeley, California USA) *August 2003 – present*

Ph.D. Electrical Engineering and Computer Sciences, expected 2009

- Advisor: Prof. Michael Gastpar

M.S. Electrical Engineering and Computer Sciences, December 2005

- Advisor: Prof. Michael Gastpar

**Rice University** (Houston, Texas USA)

*August 1999 – May 2003*

B.S. Electrical and Computer Engineering (magna cum laude), May 2003

## RESEARCH INTERESTS

Distributed computation, cooperative communication, network information theory, signal processing, structured codes, lattice coding, sensor networks, wireless communication, network coding.

## HONORS AND AWARDS

- Eli Jury Award for Outstanding Achievement in Systems, Communications, Control, or Signal Processing EECS Department, UC Berkeley, 2009
- Outstanding Graduate Student Instructor EECS Department, UC Berkeley, 2004
- Graduate Student Research Fellowship National Science Foundation, 2004-2007
- Outstanding Senior in Engineering Rice Engineering Alumni Association, 2003
- Outstanding Senior in Electrical Engineering at Rice University Texas Society of Professional Engineers, 2003
- Outstanding Junior in Electrical Engineering at Rice University Texas Society of Professional Engineers, 2002
- Brotzen Award for Achievement and Service Brown College, Rice University, 2003
- 2nd Place, AMD VLSI Design Contest Rice University, 2002
- Donald R. Baker GPA Award Brown College, Rice University, 2000-2002
- Louis J. Walsh Scholarship in Engineering Rice University, 1999-2003
- President's Honor Roll Rice University, 1999-2003

## JOURNAL PAPERS

### IN PRINT

1. B. Nazer and M. Gastpar, *The Case for Structured Random Codes in Network Capacity Theorems*, European Transactions on Telecommunications, Special Issue on New Directions in Information Theory, vol.19, no.4, pp. 455-474, June 2008.
2. B. Nazer and M. Gastpar, *Computation over Multiple-Access Channels*, IEEE Transactions on Information Theory, Special Issue on Models, Theory, and Codes for Relaying and Cooperation in Communication Networks, vol. 53, no. 10, pp. 3498-3516, October 2007.

### PREPRINTS

3. B. Nazer and M. Gastpar, *Compute-and-Forward: Harnessing Interference with Structured Codes*, Submitted to IEEE Transactions on Information Theory, August 2009.

## IN PREPARATION

4. B. Nazer, A. G. Dimakis, and M. Gastpar, *Local Interference Can Accelerate Gossip Algorithms*, IEEE Transactions on Signal Processing, to be submitted.
5. B. Nazer, M. Gastpar, S. A. Jafar, and S. Vishwanath *Ergodic Interference Alignment*, IEEE Transactions on Information Theory, to be submitted.

CONFERENCE  
PROCEEDINGS

6. B. Nazer, M. Gastpar, S. A. Jafar, and S. Vishwanath, *Ergodic Interference Alignment*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2009), Seoul, Korea, June 2009.
7. J. Zhan, B. Nazer, M. Gastpar, and U. Erez, *MIMO Compute-and-Forward*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2009), Seoul, Korea, June 2009.
8. B. Nazer, A. Sanderovich, M. Gastpar, and S. Shamaï, *Structured Superposition for Backhaul Constrained Cellular Uplink*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2009), Seoul, Korea, June 2009.
9. B. Nazer, A. G. Dimakis, and M. Gastpar, *Neighborhood Gossip: Concurrent Averaging through Local Interference*. Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2009), Taipei, Taiwan, April 2009.
10. B. Nazer and M. Gastpar, *Compute-and-Forward: A Novel Strategy for Cooperative Networks*, Proceedings of the 42nd Annual IEEE Asilomar Conference on Signals, Systems, and Computers, Monterey, CA, October 2008.
11. B. Nazer, A. G. Dimakis, and M. Gastpar, *Local Interference Can Accelerate Gossip Algorithms*. Proceedings of the 46th Annual Allerton Conference on Communication, Control and Computation, Monticello, IL, September 2008.
12. B. Nazer and M. Gastpar, *The Case for Structured Random Codes: Beyond Linear Models*. Proceedings of the 46th Annual Allerton Conference on Communication, Control and Computation, Monticello, IL, September 2008.
13. B. Nazer and M. Gastpar, *Compute-and-Forward: Harnessing Interference with Structured Codes*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2008), Toronto, Canada, July 2008.
14. B. Nazer and M. Gastpar, *Compute-and-Forward: Error-Correcting Codes for Wireless Network Coding on the Physical Layer*, Proceedings of the First IEEE International Workshop on Wireless Network Coding (WiNC 2008), San Francisco, CA, June 2008.
15. B. Nazer and M. Gastpar, *Structured Random Codes and Sensor Network Coding Theorems*. Proceedings of the 20th Biennial International Zurich Seminar on Communication (IZS 2008), Zurich, Switzerland, March 2008.
16. B. Nazer and M. Gastpar, *Lattice Coding Increases Multicast Rates for Gaussian Multiple-Access Networks*. Proceedings of the 45th Annual Allerton Conference on Communication, Control and Computation, Monticello, IL, September 2007.
17. B. Nazer and M. Gastpar, *The Case for Structured Random Codes in Network Communication Theorems*, Proceedings of the IEEE Information Theory Workshop (ITW 2007), Lake Tahoe, CA, September 2007.
18. A. D. Sarwate, B. Nazer and M. Gastpar, *Spatial Filtering in Sensor Networks with Computation Codes*, Proceedings of the IEEE Statistical Signal Processing Workshop (SSP 2007), Madison, WI, August 2007.
19. B. Nazer and M. Gastpar, *Computation over Gaussian Multiple-Access Channels*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2007), Nice, France, June 2007.
20. B. Nazer and M. Gastpar, *Computing over Multiple-Access Channels with Connections to Wireless Network Coding*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2006), Seattle, WA, July 2006.

21. B. Nazer and M. Gastpar, *Reliable Computation over Multiple-Access Channels*. Proceedings of the 43rd Annual Allerton Conference on Communication, Control and Computation, Monticello, IL, September 2005.

INVITED TALKS

- *Exploiting Interference through Structured Codes*. University of Wisconsin - Madison, Department of Electrical and Computer Engineering, Systems Seminar, April 2009.
- *Exploiting Interference through Structured Codes*. Harvard University, Electrical Engineering Seminar, April 2009.
- *Exploiting Interference through Structured Codes*. University of California, San Diego, 4th Annual Information Theory and Applications Workshop, Graduation Day, February 2009.
- *Structural Gain in Network Communication Theorems*. Texas A&M University, Department of Electrical and Computer Engineering, Networking Seminar, November 2007.
- *Computation and Reliable Communication: Structural Gain and Applications*. Rice University, Department of Electrical and Computer Engineering, Colloquium, March 2007.

PROFESSIONAL SERVICE

Reviewer for IEEE Transactions on Information Theory, IEEE Communications Letters, EURASIP Journal on Wireless Communications and Networking, IEEE International Symposium on Information Theory, IEEE Information Theory Workshop, IEEE GLOBECOM, and IEEE International Conference on Communications.

TEACHING EXPERIENCE

**University of California, Berkeley**

- EE 120: Signals and Systems *January – May 2004*  
Teaching assistant for upper-division undergraduate course in signal processing. Taught two discussion sections of 25 students each, held office hours, and wrote homework solutions.
- EE 20N: Structure and Interpretation of Signals and Systems *August – December 2003*  
Teaching assistant for lower-division undergraduate course in signal processing. Taught two discussion sections of 120 and 75 students, respectively, created handouts, and held office hours.

**Rice University**

- ELEC 301: Signals and Systems *August – December 2002*  
Teaching assistant for upper-division undergraduate course in signal processing. Ran weekly discussion and homework session for 15 students.
- ELEC 241: Fundamentals of Electrical Engineering I *August – December 2001*  
Laboratory assistant for introductory circuits lab.
- CHEM 211/212: Organic Chemistry I/II *August 2000 – May 2001*  
Teaching assistant for main organic chemistry sequence. Ran weekly discussion section for 15 students and monthly exam review for over 100 students. Created review handouts which were widely used for several years.

MEMBERSHIPS

IEEE, Information Theory Society, Signal Processing Society, Phi Beta Kappa, Tau Beta Pi, Eta Kappa Nu.

STATUS

Dual U.S./Canadian citizen.

REFERENCES

Available upon request.