

Kambiz Azarian

Postdoctoral Researcher

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EDUCATION

- ◇ **Ph.D. in Electrical Engineering**, August 2006.
The Ohio State University, Columbus OH.
Thesis title: *Outage Limited Cooperative Channels: Protocols and Analysis*.
Advisors: Hesham El Gamal and Philip Schniter.
- ◇ **M.Sc. in Electrical Engineering**, March 1999.
Amirkabir University of Technology, Tehran IRAN.
Thesis title: *Efficient algorithms for computation of MPEG2 motion-vectors*.
Advisor: Hassan Aghaeinia.
- ◇ **B.Sc. in Electrical Engineering**, September 1996.
Shahid Beheshti University, Tehran IRAN.

PUBLICATIONS

◇ Journal Publications

1. K. Azarian, H. El Gamal and P. Schniter, "On the Achievable Diversity-Multiplexing Tradeoff in Half-Duplex Cooperative Channels," *IEEE Trans. Info. Theory*, vol. 51, no. 12, Dec. 2005, pp. 4152-4172.
2. K. Azarian and H. El Gamal, "The Throughput-Reliability Tradeoff in Block-Fading MIMO Channels," *IEEE Trans. Info. Theory*, vol. 53, no. 2, Feb. 2007.
3. A. Murugan, K. Azarian and H. El Gamal, "Cooperative Lattice Coding and Decoding," *IEEE Jour. On Select. Areas in Comm.*, vol. 25, no. 2, Feb. 2007.
4. K. Azarian, H. El Gamal and P. Schniter, "On the Optimality of the ARQ-DDF Protocols," *IEEE Trans. Info. Theory*, accepted subject to revisions, Jan. 2006.
5. D. Chen, K. Azarian and J. N. Laneman, "A Case for Amplify-Forward Relaying in the Block-Fading Multi-Access Channel," *IEEE Trans. Info Theory*, submitted, Jan. 2007.
6. K. Azarian and J. N. Laneman, "An Information Theoretical Framework for Space-Time Code Design", in preparation.

◇ Conference Publications

1. K. Azarian, A. Murugan and H. El Gamal, "Cooperative Lattice Coding and Decoding," *2007 UCSD Workshop on Information Theory and Its Applications, Feb 2007, La Jolla, CA*.
2. A. Murugan, K. Azarian and H. El Gamal, "Cooperative Lattice Coding and Decoding," *2007 IEEE International Conference on Acoustics, Speech, and Signal Processing, submitted, Sep. 2006*.
3. K. Azarian and H. El Gamal, "On the Utility of a 3dB SNR Gain in MIMO Channels," *2006 IEEE International Symposium on Information Theory, 9-14 July 2006, Seattle, WA*.
4. K. Azarian and H. El Gamal, "What Does a 3dB Buy in MIMO Channels?" **Invited Paper**, *2006 UCSD Workshop on Information Theory and Its Applications, 6-10 Feb 2006, La Jolla, CA*.

5. K. Azarian and H. El Gamal, "Cooperation in Outage-limited Multiple-Access Channels," **Invited Paper**, *2006 IEEE International Zurich Seminar on Communications*.
6. K. Azarian, H. El Gamal, "Beyond the Multiplexing-Gain: The Throughput-Reliability Trade-off," *Allerton Conf. on Communication, Control, and Computing, 2005, Monticello, IL*.
7. K. Azarian, Y. Nam and H. El Gamal, "Multi-User Diversity without Transmitter CSI," *2005 IEEE International Symposium on Information Theory, 4-9 Sept. 2005, Adelaide, Australia, pp. 2055-2059*.
8. K. Azarian, H. El Gamal, "From Diversity-Multiplexing to Diversity-Rate Tradeoff," **Invited Talk**, *2005 IEEE Communication Theory Workshop (CTW05), June 12-15 2005, Park City, Utah*.
9. Y. Nam, K. Azarian and H. El Gamal, "Cooperation Through ARQ," **Invited Paper**, *2005 IEEE 6th Workshop on Signal Processing Advances in Wireless Communications (SPAWC05), June 5-8 2005, New York City, New York, pp. 1023-1027*.
10. K. Azarian, H. El Gamal and P. Schniter, "Achievable Diversity-vs-Multiplexing Tradeoffs in Half-Duplex Cooperative Channels," *Proc. 2004 IEEE Information Theory Workshop, Oct. 24-29 2004, San Antonio, TX, pp. 292-297*.
11. K. Azarian, H. El Gamal and P. Schniter, "On the Achievable Diversity-Multiplexing Tradeoff in Half Duplex Cooperative Channels," **Invited Paper**, *Proc. Allerton Conf. on Communication, Control, and Computing, Oct. 2004, Monticello, IL*.
12. K. Azarian, H. El Gamal and P. Schniter, "On the Achievable Diversity-vs-Multiplexing Tradeoff in Cooperative Channels" *Proc. Conference on Information Sciences and Systems, Mar. 2004, Princeton, NJ*.
13. K. Azarian, H. El Gamal, and P. Schniter, "On the Design of Cooperative Transmission Schemes," *Proc. Allerton Conf. on Communication, Control, and Computing, Oct. 2003, Monticello, IL*.

RESEARCH
INTERESTS

- ◇ My research interests include topics in wireless communications, information theory, coding theory and sensor networks. In particular, I am interested in the design and analysis of cooperative protocols (for both, narrowband and wideband regimes) and their associated encoders and decoders. Among my other research interests are development of information theoretical tools for design and analysis of wireless protocols and space-time codes. I am also interested in the design and analysis of sensor network protocols.

HONORS

- ◇ **Teaching Fellow**, Fall 2005
The Ohio State University, ECE Department.

TEACHING
EXPERIENCE

- ◇ **Teaching Fellow**, Fall 2005
The Ohio State University, ECE Department.
Designed and taught an undergraduate course on electrical circuits (EE205).
- ◇ **Part-time Lecturer**, Spring 2001
Shahid Beheshti University, Tehran IRAN.
Designed and taught an undergraduate course on TV broadcasting.
- ◇ **Part-time Lecturer**, Fall 2000
Azad University, Tehran IRAN.
Designed and taught an undergraduate course on computer architecture.

PROFESSIONAL
EXPERIENCE

- ◇ **Postdoctoral Researcher**, Fall 2006-Present
University of Notre Dame.
Conducting research on MAC protocol design for multi-hop sensor networks. Also, development of an information theoretical framework for designing space-time codes.

- ◇ **Research Assistant**, Fall 2002-Summer 2006
The Ohio State University.
Conducting research on protocol design and analysis for wireless cooperative channels.
- ◇ **Systems Engineer** 1999-2001
Informatics Services Corp., Tehran IRAN.
Contributed to the design and implementation of a FPGA based upgrade kit for NCR 3G ATMs.
Also contributed to the development of a software package for ATM-Host communication according to X.25 protocol.
- ◇ **Systems Engineer**, 1997-1998
Zag Chemi Co., Tehran IRAN.
Designed and implemented a microprocessor based system for measurement and control of pH, temperature and humidity.
- ◇ **Engineering Intern**, Summer 1994
Communications Research Center, Tehran IRAN.

PROFESSIONAL
SERVICE

- ◇ **Reviewer for:**
IEEE Trans. on Info Theory, IEEE Jour. on Select. Areas in Comm., IEEE Trans. on Comm.,
IEEE Inter. Conf. on Comm.

GRADUATE
COURSEWORK

- ◇ **Ph.D. Coursework**
Digital Signal Processing, Error Control Coding, Random Processes, Signal Detection and Estimation, Information Theory, Digital Communications, Adv. Digital Communications, Linear System Theory, Digital Control, Optimal Control, Abstract Algebra, Real Analysis.
- ◇ **M.Sc. Coursework**
Stochastic Processes, Adv. Communication Theory, Spread Spectrum Systems, Digital Signal Processing, Adv. Signal Processing, Speech Processing, Image Processing, Neural Networks,

REFERENCES

- ◇ **Prof. Hesham El Gamal**
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Department of Electrical & Computer Engineering
205 Drees Labs; 2015 Neil Avenue, Columbus, OH 43210
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- ◇ **Prof. Lizhong Zheng**
Massachusetts Institute of Technology
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- ◇ **Prof. Philip Schniter**
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- ◇ **Prof. Pramod Viswanath**
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- ◇ **Prof. Martin Haenggi**
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