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Research Interests

Information theory, the theory of communications and its applications: wireless communication systems and networks; cellular mobile radio networks.

Education

- **UC Berkeley** Berkeley, CA
Ph.D. in EECS 12/2005-09/2008
 - Thesis: A Deterministic Model For Wireless Networks And Its Applications
 - Advisor: Prof. David Tse
 - Description: We present a new multiuser channel model which is analytically simpler than the commonly used Gaussian model, but yet still captures the key features of wireless communication. Our model makes both analyzing the performance of specific strategies and finding fundamental limits for wireless networks very simple and intuitive. In particular, we use this deterministic model to approximate the unknown capacity of Gaussian Relay networks within a constant number of bits independent of the channel parameters.
 - GPA: 4.0
- **UC Berkeley** Berkeley, CA
M.Sc in EECS 8/2003-12/2005
 - Thesis: Outage Capacity of the Fading Relay Channel in the Low SNR Regime
 - Advisor: Prof. David Tse
 - Description: We consider a basic cooperative scenario in wireless networks, where the communication from the source to the destination is assisted by a single relay. Here, we focus on the outage performance of this system and characterize its capacity in a limited energy scenario, for applications such as sensor networks.
 - GPA: 4.0
- **Shairf University of Technology** Tehran, Iran
B.Sc in EE 8/1999-7/2003
 - Thesis: Multirate Structures for Arbitrary Rate Error Control Coding
 - Advisor: Prof. Kambiz Nayebi
 - GPA: 3.81

Honors and Awards

David J. Sakrison Memorial Prize for the most outstanding research in EECS Dept. of UC Berkeley	2008
Vodafone-U.S. Foundation Fellows Initiative Research Merit Award	2005
Vodafone Fellowship	2003, 2004
UC Berkeley departmental fellowship	2003
Ranked 1st place in the EE department at Shaif University of Techonology	2002
Ranked 1st place and recipient of the best innovative award of AAAI Robot Competition	2002
Ranked 2nd place and recipient of the presidential award in Iranian National Qualifying Exam	1999
Recipient of silver medal of Iranian National Mathematical Olympiad	1998

Work Experiences

- **Wichorus Inc.** San Jose, CA
Scientist May 2006 - August 2006
 - Wichorus Inc. is a new startup funded by leading Silicon Valley investors. I have been involved in designing a few innovative traffic scheduling algorithms that are currently deployed in our ASN Gateway solution for mobile WiMax systems.
- **Qualcomm Inc.** Campbell, CA
Summer Intern June 2005 - August 2005
 - My project was to design an adaptive algorithm to track the channel statistics at the receiver of a broadband wireless system. The algorithm that I developed was based on adaptive Kalman filtering.
- **Iran Telecommunication Research Center** Tehran, Iran
Summer Intern June 2002 - August 2002
 - I was involved in exploring and analyzing different tracking algorithms in the existing cellular deployment.

Teaching Experiences

- **UC Berkeley** Berkeley, CA
Teaching assistant Jan 2006 - May 2006
 - EE121: Introduction to Digital Communication Systems.
 - EE224A: Digital Communications.
- **Sharif University of Technology** Tehran, Iran
Teaching assistant Jan 2001 - Dec 2001
 - Signals and Systems.
 - Electromagnetic Fields and Waves

Publications

- A. S. Avestimehr, S N. Diggavi and D N C. Tse, "Wireless network information flow: a deterministic approach", preprint.
- A. S. Avestimehr, A. Sezgin and D N C. Tse, "Approximate capacity of the two-way relay channel: a deterministic approach", *Proc. of Allerton Conference*, UIUC, September 2008.
- S. Pawar, A. S. Avestimehr and D N C. Tse, "Diversity multiplexing tradeoff of the half-duplex relay channel", Invited paper, *Proc. of Allerton Conference*, UIUC, September 2008.
- A. S. Avestimehr, S N. Diggavi and D N C. Tse, "Information flow over compound wireless relay networks", *Proc. of IEEE international Zurich seminar (IZS)*, 2008.
- A. S. Avestimehr, S N. Diggavi and D N C. Tse, "Approximate characterization of capacity in Gaussian relay networks", *Proc. of IEEE International Wireless Communications and Mobile Computing Conference (IWCMC)*, Crete, August 2008.
- A. S. Avestimehr, S N. Diggavi and D N C. Tse, "Wireless Network Information Flow", Invited paper, *Proc. of Allerton Conference*, UIUC, September 2007.

- A. S. Avestimehr, S N. Diggavi and D N C. Tse, "A Deterministic Approach to Wireless Relay Networks", Invited paper, *Proc. of Allerton Conference*, UIUC, September 2007.
- A. S. Avestimehr, S N. Diggavi and D N C. Tse, "A deterministic model for wireless relay networks and its capacity", *IEEE Information Theory Workshop (ITW)*, Bergen, July 2007.
- A. S. Avestimehr and D N C. Tse, "Outage Capacity of the Fading Relay Channel in the Low SNR Regime", *IEEE trans. on Info. Theory*, Volume: 53, Issue: 4, April 2007.
- A. S. Avestimehr and D N C. Tse, "Outage-Optimal Relaying in the Low SNR Regime", *In Proceedings, ISIT*, Adelaide, Australia, Sept 2005.
- A. Sahai, A. S. Avestimehr and P. Minero, "Anytime communication over the Gilbert-Eliot channel with noiseless feedback", *In Proceedings, ISIT*, Adelaide, Australia, Sept 2005.
- A. S. Avestimehr and K. Barkeshli, "A Solution of Elementary Electrostatic Problems Using Conformal Mapping", *Sharif University Journal*, 2002.

Professional services

Served as a reviewer for,

- IEEE transactions on information theory.
- IEEE transactions on wireless communication.
- IEEE transactions on signal processing.
- Conferences: ISIT 2006, 2007, Globecom 2006, ICC 2006, ITW 2007, ACM 2006.

Skills

Languages: C/C++

Applications: Mathematica, MatLab, OPNET Networking Simulation Platform, LabVIEW

References

Available upon request.