

Ravi Tandon

CONTACT INFORMATION

2454 A.V. Williams Building
Department of Electrical and Computer Engineering
University of Maryland
College Park, MD 20742 USA

E-mail: ravit@umd.edu
Phone (O): (301) 405-6582
Phone (M): (240) 338-0118

RESEARCH INTERESTS Information Theory, Wireless Communication Theory.

EDUCATION

University of Maryland, College Park, Maryland USA

Ph.D. Candidate

Advisor: Prof. Sennur Ulukus

Since August 2004

Indian Institute of Technology, Kanpur, India

B.Tech. Electrical Engineering

May 2004

PUBLICATIONS

Journal Papers

- J3. *Secure Source Coding with a Helper.*
Ravi Tandon, Sennur Ulukus and Kannan Ramchandran.
IEEE Transactions on Information Theory, submitted October, 2009.
- J2. *Dependence Balance Based Outer Bounds for Gaussian Networks with Cooperation and Feedback.*
Ravi Tandon and Sennur Ulukus.
IEEE Transactions on Information Theory, submitted December, 2008.
- J1. *Outer Bounds for Multiple Access Channels with Feedback using Dependence Balance.*
Ravi Tandon and Sennur Ulukus.
IEEE Transactions on Information Theory, 55(10):4494-4507, October 2009.

Conference Papers

- C9. *Diamond Channel with Partially Separated Relays.*
Ravi Tandon and Sennur Ulukus.
IEEE International Symposium on Information Theory, Austin, TX, June 2010.
- C8. *Secure Source Coding with a Helper.*
Ravi Tandon, Sennur Ulukus and Kannan Ramchandran.
47th Annual Allerton Conf. on Communications, Control and Computing, Monticello, IL, Sep. 2009.
- C7. *Outer Bounds for User Cooperation.*
Ravi Tandon and Sennur Ulukus.
IEEE International Symposium on Information Theory, Seoul, Korea, June 2009.
- C6. *On the Rate-limited Gelfand-Pinsker Problem.*
Ravi Tandon and Sennur Ulukus.
IEEE International Symposium on Information Theory, Seoul, Korea, June 2009.
- C5. *Capacity bounds for the Gaussian Interference Channel with Transmitter Cooperation.*
Ravi Tandon and Sennur Ulukus.
IEEE Information Theory Workshop, Volos, Greece, June 2009.
- C4. *On the Capacity Region of the Gaussian Multiple Access Channel with Noisy Feedback.*
Ravi Tandon and Sennur Ulukus.
IEEE International Conference on Communications, Dresden, Germany, June 2009.
- C3. *A New Upper Bound on the Capacity of a Class of Primitive Relay Channels.*
Ravi Tandon and Sennur Ulukus.
46th Annual Allerton Conf. on Communications, Control and Computing, Monticello, IL, Sep. 2008.
- C2. *A New Upper Bound for a Binary Additive Noisy Multiple Access Channel with Feedback.*
Ravi Tandon and Sennur Ulukus.
IEEE Global Communications Conference, New Orleans, LA, November 2008.
- C1. *On Dependence Balance Bounds for Two-Way Channels.*
Ravi Tandon and Sennur Ulukus.
41st Asilomar Conference on Signals, Systems and Computers, Pacific Grove, CA, November 2007.

PROFESSIONAL AND
RESEARCH
EXPERIENCE

University of Maryland, College Park.

Graduate Research Assistant

Advisor: Prof. Sennur Ulukus

Primary research focus:

- Developed new outer bounds for the multiple access channel with noiseless feedback. Through explicit examples, it was shown that the cut-set outer bound is suboptimal in general for the multiple access channel with noiseless feedback.
- Investigated the Gaussian multiple access channel with various forms of imperfect feedback, i.e., noisy feedback and the user cooperation channel model. Such models capture the nature of feedback in practical wireless systems, since realistically, feedback is corrupted with noise. New outer bounds were proposed for these channel models. It was shown that these bounds exhibit sensitivity to the noise in feedback links and for limiting cases of feedback noises, yield tight capacity results. These results are also generalized for the Gaussian interference channel with user cooperation.
- Proposed new bounds on the capacity of state-dependent channels with rate-limited state-information at encoder and decoder. These bounds yield all known results for these channel models and improve upon the best known upper bounds.

August 2004 - present

University of California, Berkeley.

Visiting Student Researcher

Host: Prof. Kannan Ramchandran

Primary research focus:

Studied a lossless secure source coding problem with a rate-limited helper. Two generalizations of this problem were studied and corresponding rate-equivocation regions were completely characterized. These results yield insights into the insufficiency of Slepian-Wolf coding for lossless source coding with a security criteria.

Feb 2009 - July 2009

Institute for Infocomm Research, Singapore.

Summer Intern

Host: Prof. A. Rahim Leyman

Primary research focus:

Investigated higher-order cumulants based multiple signal classification (MUSIC), estimation of signal parameters via rotational invariance techniques (ESPRIT) algorithms for estimation of direction-of-arrival of sources.

May 2003 - July 2003

Indian Institute of Management (IIM), Kolkata, India.

Summer Intern

Host: Prof. Debashis Saha

May 2002 - July 2002

OTHER ACTIVITIES

- Speaker at ECE Graduate Student Association (ECEGSA) Seminar Series, November, 2009.
- Attended 1st and 2nd Annual School of Information Theory, Penn State University, 2008, Northwestern University, 2009.
- Attended Summer School of Information Theory, Syracuse University, 2008.

RELEVANT
COURSEWORK

Information Theory, Random Processes, System Theory, Estimation and Detection, Wireless Communication Theory, Multiuser Communication, Digital Communications, Advanced Digital Signal Processing, Advanced Stochastic Processes, Real Analysis.

HONORS

University of Maryland Graduate Fellowship, 2004-2005.

OTHERS

Reviewer for IEEE Transactions on Information Theory.
Reviewer for ISIT, ITW, Globecom, ICC, WCNC.

VISA STATUS

F1 Student Visa.

REFERENCES

Prof. Sennur Ulukus
ECE, UMD
ulukus@umd.edu

Prof. Prakash Narayan
ECE, UMD
prakash@umd.edu

Prof. Alexander Barg
ECE, UMD
abarg@umd.edu

Prof. Kannan Ramchandran
EECS, UC Berkeley
kannanr@eecs.berkeley.edu