

Eric (Xijin) Yan

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- Objective** Seeking a research and development position in the areas of wireless communications and networking, wireless ad hoc and sensor networks that utilizes my qualitative and quantitative research and project skills in
- *Network Coding*
 - *Stochastic Network Optimization*
 - *Network Error Correction*
 - *Network Security*
- Education**
- Ph.D. Candidate, Electrical Engineering** **May, 2007**
University of Southern California, Los Angeles, California GPA: 3.98/4.00
- M.S., Mathematics** **May, 2003**
Michigan State University, East Lansing, Michigan GPA: 4.00/4.00
- B.S.E., Mechanical Engineering** **July, 2000**
Shanghai Jiao Tong University, Shanghai, China GPA: 86/100 (Top 5%)
- Research Experience**
- Communication Sciences Institute, USC, Los Angeles, California** **Aug. '03 - Present**
Research Assistant (Advisor: Prof. Zhen Zhang)
- Derived explicitly tight and implicitly exact characterizations for the capacity region for general multi-source networks with cross-multicast network coding
 - Determined the error correction capability and the decoding failure probability of packetized random linear network codes and designed decoding algorithms that decode beyond error correction capability in single source multicast networks
 - Characterized the capacity region for time-varying wireless networks with intra-multicast network coding and designed dynamic cross-layer control algorithms that jointly achieve utility optimization and network stability
 - Proved the optimality of intra-session network coding in achieving minimum total transmission cost in multiple unicast networks
- Dept. of Biomedical Engineering, USC, Los Angeles, California** **May '04 – Aug. '04**
Summer Research Assistant
- Applied a Lloyd-Max based iterative vector quantization algorithm to parameter training and classification in MIMO synaptic systems
 - Participated in the development of a custom C++ based middleware platform, PS.LINDA, for high performance computing based on parallel shared-memory coordination schemes
- Mobile Network Division, Alcatel Shanghai Bell, Shanghai, China** **July '00 - May '01**
Wireless Systems Engineer
- Participated in world-wide projects of GSM/CDMA system development, including unitary test, subsystem integration test, performance simulation and trouble-shooting, etc
- Research Projects**
- Energy optimal control for time-varying wireless networks using random network coding
 - Distributed utility maximization in energy and complexity constrained wireless sensor networks
 - A lower bound on the network coding capacity for cell-partitioned mobile ad hoc networks
 - A practical scheme on network coding security via random message injection
 - Sphere decoder design in Gaussian MIMO fading channels
 - Image compression with trellis coded vector quantization (TCQ)
 - Text compression with Lempel-Ziv FG and Gamma-based coding algorithms

Journal Publications

1. X. Yan, J. Yang, and Z. Zhang, "An Outer Bound for Multi-source Multi-sink Network Coding with Minimum Cost Consideration", *IEEE Transaction on Information Theory & IEEE/ACM Transaction on Networking (joint issue)*, vol. 52, no. 6, pp. 2373-2385, June 2006.
2. X. Yan, R. W. Yeung, and Z. Zhang, "The Capacity Region for Multi-source Multi-sink Network Coding", to be submitted to *IEEE Transaction on Information Theory*.
3. X. Yan, M. J. Neely and Z. Zhang, "Multicasting in Time-varying Wireless Networks: The Capacity Region and Optimal Resource Allocation", to be submitted to *IEEE/ACM Transaction on Networking*.
4. X. Yan, H. Balli and Z. Zhang, "Decoding beyond Error Correction Capability for Random Network Error Correction Codes", to be submitted to *IEEE Transaction on Information Theory*.
5. H. Balli, X. Yan, and Z. Zhang, "Error Correction Capability of Random Network Error Correction Codes", to be submitted to *IEEE Transaction on Information Theory*.

Conference Publications

1. X. Yan, R. W. Yeung, and Z. Zhang, "The Capacity Region for Multi-source Multi-sink Network Coding", to appear in *IEEE International Symposium on Information Theory*, Jan. 2007.
2. X. Yan, M. J. Neely, and Z. Zhang, "Multicasting in Time-varying Wireless Networks: The Capacity Region and Cross-layer Dynamic Resource Allocation", to appear in *IEEE International Symposium on Information Theory*, Jan. 2007.
3. H. Balli, X. Yan, and Z. Zhang, "Error Correction Capability of Random Network Error Correction Codes", to appear in *IEEE International Symposium on Information Theory*, Jan. 2007.
4. X. Yan, H. Balli and Z. Zhang, "Decoding beyond Error Correction Capability of Random Network Error Correction Codes", to be submitted in the new result session of *IEEE International Symposium on Information Theory*.
5. X. Yan, and Z. Zhang, "The Capacity Region for Degree-2 K-pairs Three-layer Networks", in *Proc. IEEE International Symposium on Information Theory*, Seattle, July 2006.
6. X. Yan, J. Yang, and Z. Zhang, "Explicit Inner and Outer Bounds for Multi-source Multi-sink Network Coding", in *Proc. IEEE International Symposium on Information Theory*, Seattle, July 2006.
7. X. Yan, J. Yang, and Z. Zhang, "An Improved Outer Bound for Multi-source Multi-sink network Coding", in *Proc. First Workshop on Network Coding, Theory and Applications*, Riva del Garda, Italy, Apr. 2005.

Computer Skills

- Languages: C/C++, Matlab, Visual Basic, HTML
- Packages: OPNET, NS 2, Standard Office Tools, S-Plus, LATEX, AutoCAD
- Platforms: Unix/Linux, MS Windows NT
- Certificates: Microsoft Certified Systems Engineer (MCSE)

Honors and Awards

- University of Southern California Graduate Research Assistantship, 2003 - Present
- Michigan State University Graduate Teaching and Research Assistantship, 2001 - 2003
- Michigan State University Outstanding Scholarship in Business Management, 2001 - 2002
- Shanghai Jiao Tong University Outstanding Student Award (top 5%), 1996 - 2000
- IEEE Student Member of the Information Theory Society, 2004 - Present
- Reviewer for IEEE Transaction IT, ISIT, ITW, NetCod, etc, 2003 - 2006