

Jian Tan

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Research Interests

Mathematical foundations of information networks and complex service systems. My thesis work focuses on the origins of heavy tails and long-range dependence with application to information networks, the design of scheduling algorithms for communication networks, and the network performance modeling and reliability evaluation.

Education

February 2009	Ph.D. in Electrical Engineering, Columbia University, NY Advisor: Prof. Predrag R. Jelenkovic
February 2004	M.S. in Electrical Engineering, Columbia University, NY
July 2002	B.E. degree in Electrical Engineering & Information Science, University of Science and Technology of China, China Class rank: 1 st out of 117 students

Awards

2008	Eliahu Jury Award for the best PhD thesis in Systems, Communication and Signal Processing, Department of Electrical Engineering, Columbia University
2007	Best Student Paper Award at the 20th International Teletraffic Congress (ITC'20); in addition, this work was selected as a Top 3 paper, out of 98 accepted papers, for presentation in the plenary session.
2007	Best Paper Award at the 3rd IEEE International Conference on Distributed Computing in Sensor Systems (DCOSS '07)
2003	Extraordinary Teaching Assistant Award in the School of Engineering and Applied Science at Columbia University
2001	Guo Moruo Scholarship, the highest honor of University of Science and Technology of China, named after the first president of the Chinese Academy of Sciences
2000	The Scholarship of Chinese Academy of Sciences

Research and Working Experience

March 2009 – current	Post Doctoral Researcher, Networking and Communications group, the Department of Electrical and Computer Engineering at The Ohio State University, working with Prof. Ness Shroff <ol style="list-style-type: none">1) Modeling, analysis, and algorithms for stochastic control of multi-scale networks.2) Scheduling algorithms for multi-hop wireless networks.3) The interplay of queueing and information theory.
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- October-December 2007 Intern, Microsoft Research Cambridge Lab, System and Networking group
 Participated in the project that implemented the joint flow control and routing scheme based on the backpressure policy in the Microsoft Cambridge Lab wireless LAN. Analytical methods were used to identify the inefficiency of the original algorithm, from which an improved one was proposed.
- Summer 2006 Intern, Lucent Bell Laboratories, Math Center
 Participated in the initial design and simulation of an intrusion detection algorithm for sensor systems.
- Summer 2005 Intern, Lucent Bell Laboratories, Math Center
 Finished one paper with Y. Baryshnikov on localization for anchoritic sensor networks. This paper won the Best Paper Award at DCOSS '07.
- 2002 – 2007 Graduate Research Assistant, Department of Electrical Engineering, Columbia University, NY

Teaching Experience

- 2003 – 2006 Teaching Assistant, Department of Electrical Engineering, Columbia University, New York.
 Held problem solving sessions, office hours; graded homeworks and exams; won an Extraordinary Teaching Assistant Award.

Computer Skills

Unix/Linux, Windows, C/C++, Linux Kernel, Matlab, Mathematica, SQL

Publications (authors by alphabetical order)

Journals

- [J1] Heavy-Tailed Limits for Medium Size Jobs and Comparison Scheduling. *Annals of Operations Research*, Special Issue on Stochastic Performance Models for Resource Allocation in Communication Systems, 2009. (with P. R. Jelenkovic and X. Kang)
- [J2] Modulated Branching Processes, Origins of Power Laws and Queueing Duality. Under the final round review at *Mathematics of Operations Research*, 2007. (with P. R. Jelenkovic)
- [J3] Characterizing Heavy-Tailed Distributions Induced by Retransmissions, 2007. Under review at *Annals of Applied Probability*, 2007. (with P. R. Jelenkovic)
- [J4] Stability of Finite Population ALOHA with Variable Packets. Under review at *IEEE Transactions on Information Theory*, February, 2009. (with P. R. Jelenkovic)

Conferences

- [C1] Modulated Branching Processes and Origins of Power Laws, in *Proceedings of the*

- Forty-Fourth Annual Allerton Conference on Communication, Control, and Computing*, Urbana-Champaign, Illinois, September, 2006. (with P. R. Jelenkovic)
- [C2] Heavy-Tailed Limits for Medium-Size Jobs with Popular Schedulers, *Workshop of Stochastic Performance Models for Resource Allocation in Communication Systems*, Amsterdam, The Netherlands, November 8-10, 2006. (with P. R. Jelenkovic and X. Kang)
- [C3] Can Retransmissions of Superexponential Documents Cause Subexponential Delays?, in *Proceedings of IEEE INFOCOM'2007*, pp. 892-900, Anchorage, Alaska, May 6-12, 2007. (with P. R. Jelenkovic)
- [C4] Is ALOHA Causing Power Law Delays?, in *Proceedings of the 20th International Teletraffic Congress (ITC-20)*, Ottawa, Canada, June 17-21, 2007; *Lecture Notes in Computer Science*, No. 4516, pp. 1149-1160, Springer-Verlag, 2007 (Best Student Paper Award). (with P. R. Jelenkovic)
- [C5] Adaptive and Scalable Comparison Scheduling, in *Proceedings of ACM International Conference on Measurement and Modeling of Computer Systems (SIGMETRICS 2007)*, Vol. 35, No. 1, pp. 215-266, San Diego, California, June 12-16, 2007. (with P. R. Jelenkovic and X. Kang)
- [C6] Localization for Anchoritic Sensor Networks, in *Proceedings of The 3rd IEEE International Conference on Distributed Computing in Sensor Systems (DCOSS '07)*, Santa Fe, New Mexico, June 18-20, 2007 (Best Paper Award). (with Y. Baryshnikov)
- [C7] Are End-to-end Acknowledgements Causing Power Law Delays in Large Multi-hop Networks?, *The Fourteenth Applied Probability Society of INFORMS Conference*, Eindhoven, The Netherlands, July 9-11, 2007. (with P. R. Jelenkovic)
- [C8] Characterizing Heavy-Tailed Distributions Induced by Retransmissions, *Workshop of Transient and Asymptotic Analysis of Queues*, EURANDOM, Eindhoven, The Netherlands, October 17-19, 2007 (invited talk). (with P. R. Jelenkovic)
- [C9] Dynamic Packet Fragmentation for Wireless Channels with Failures, in *Proceedings of MobiHoc'08*, Hong Kong SAR, China, May 2008. (with P. R. Jelenkovic)
- [C10] Steady State Characteristics of ALOHA with Variable Size Packets, *INFORMS Annual Meeting*, Washington D.C., October, 2008. (with P. R. Jelenkovic)
- [C11] Transition from Heavy to Light Tails in Retransmission Durations, submitted, September, 2009. (with Ness Shroff)
- [C12] Joint Power and Secret Key Buffer Management to Achieve Delay Limited Secrecy, submitted, September, 2009. (with Onur Gungor, Can Emre Koksal, Hesham EI-Gamal and Ness Shroff)

References:

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