

DA WANG

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<https://adgnaw.github.io/>

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| EDUCATION | MIT, Electrical Engineering & Computer Science Ph.D 2010–2014 <i>Thesis:</i> Computing with Unreliable Resources: Design, Analysis and Algorithms <i>Advisor:</i> Gregory W. Wornell GPA: 5.0/5.0 <i>Major:</i> Electrical Engineering, <i>Minor:</i> Finance MIT, Electrical Engineering & Computer Science Master of Science 2010 <i>Thesis:</i> Distinguishing codes from noise: fundamental limits and applications to sparse communication <i>Advisor:</i> Gregory W. Wornell GPA: 5.0/5.0 University of Toronto, Electrical Engineering Bachelor of Applied Science 2008 <i>Major:</i> Electrical Engineering, <i>Minor:</i> Mathematics GPA: 3.95/4 |
| RESEARCH EXPERIENCES | Signals, Information & Algorithms Lab, Research Laboratory of Electronics (RLE), MIT <i>Advisor:</i> Prof. G. W. Wornell <i>Computing with unreliable resources</i> Oct. 2011–Jun. 2014 <ul style="list-style-type: none">Investigate the role of redundancy and feedback in computing with noisy resources, with applications to sorting algorithms, distributed computing and reliable circuit design. <i>Fundamental limits of joint source-channel coding</i> Mar. 2011–Dec. 2011 <ul style="list-style-type: none">Investigated behavior of joint source-channel coding at finite block-length and characterized the <i>joint source-channel dispersion</i>.Demonstrated the advantage of joint source-channel coding over any separation-based scheme at finite block length.Proved the exponentially strong converse for joint source-channel coding.Evaluated the dispersion of unequal error protection channel coding as a side result. <i>Efficient frame synchronization</i> Sep. 2008–Jun. 2010 <ul style="list-style-type: none">Investigated the fundamental performance limits of frame synchronization in the presence of noise.Identified the inefficiency in existing frame synchronization schemes, where synchronization is separated from data transmission.Proposed a joint synchronization-communication scheme that leads to significant performance gain in the high communication rate regime. Electrical & Computer Engineering, University of Toronto <i>Multicast capacity of network coding in broadcast-mode</i> May 2007–Aug. 2008 <ul style="list-style-type: none">Mentor: Prof. F. R. KschischangProposed an efficient protocol to counter the pollution attack in network coding. <i>Webpage prefetching in wireless heterogeneous networks</i> May 2005–Aug. 2005 <ul style="list-style-type: none">Mentor: Prof. B. LiangProposed the optimal strategy for web prefetching in heterogeneous wireless networks. |
| PUBLICATIONS | <ol style="list-style-type: none">D. Wang, A. Mazumdar, and G. W. Wornell, “Compression in the Space of Permutations,” <i>accepted to IEEE Transactions on Information Theory</i>D. Wang, G. Joshi, G. W. Wornell, “Using Straggler Replication to Reduce Latency in Large-scale Parallel Computing,” <i>ACM Sigmetrics Distributed Cloud Computing Workshop (DCC 2015)</i>, Portland, OR, 2015D. Wang, Y. Polyanskiy, G. W. Wornell, “Scalar Quantization with Noisy Partitions and its Application to Flash ADC Design,” <i>Proc. IEEE International Symposium of Information Theory</i>, Honolulu, HI, 2014 |

4. **D. Wang**, A. Mazumdar, and G. W. Wornell, "Lossy compression of permutations," *Proc. IEEE International Symposium of Information Theory*, Honolulu, HI, 2014
5. H. Zhou, **D. Wang**, and G. W. Wornell, "A Simple Class of Efficient Compression Schemes Supporting Local Access and Editing," *Proc. IEEE International Symposium of Information Theory*, Honolulu, HI, 2014
6. **D. Wang**, G. Joshi, and G. W. Wornell, "Efficient Job Replication for Fast Response Times in Parallel Computation," *ACM Sigmetrics*, Austin, TX, 2014
7. **D. Wang**, A. Mazumdar, and G. W. Wornell, "A rate-distortion theory for permutation spaces," *Proc. IEEE International Symposium of Information Theory*, Istanbul, Turkey, 2013
8. **D. Wang**, V. Chandar, S.-Y. Chung and G. W. Wornell, "On Reliability Functions for Single-Message Unequal Error Protection," *Proc. IEEE International Symposium of Information Theory*, Cambridge, MA, 2012
9. **D. Wang**, A. Ingber, Y. Kochman, "A Strong Converse for Joint Source-Channel Coding," *Proc. IEEE International Symposium of Information Theory*, Cambridge, MA, 2012
10. A. Ingber, **D. Wang**, Y. Kochman, "Dispersion Theorems via Second Order Analysis of Functions of Distributions," *Proc. 46th Annual Conference on Information Sciences and Systems (CISS)*, Princeton, NJ, 2012
11. **D. Wang**, A. Ingber, Y. Kochman, "The Dispersion of Joint Source-Channel Coding," *Proc. 49th Annual Allerton Conference on Communication, Control, and Computing*, Monticello, IL, September 2011.
12. **D. Wang**, V. Chandar, S.-Y. Chung and G. W. Wornell, "Error Exponents in Asynchronous Communication," *Proc. IEEE International Symposium on Information Theory*, St. Petersburg, Russia, August 2011
13. **D. Wang**, D. Silva and F. R. Kschischang, "Robust Network Coding in the Presence of Untrusted Nodes," *IEEE Transactions on Information Theory*, vol 56, issue 9, pp 4532-4538, September 2010.
14. B. Liang, S. Drew, and **D. Wang**, "Performance of Multiuser Network-aware Prefetching in Heterogeneous Wireless Systems," *ACM/Springer Wireless Networks*, vol 15, no. 1, pp 99-110, January 2009.
15. **D. Wang**, D. Silva, F. R. Kschischang, "Constricting the Adversary: A Broadcast Transformation for Network Coding," *Proc. 45th Annual Allerton Conference on Communication, Control, and Computing*, Monticello, IL, September 2007.

TEACHING
EXPERIENCE

6.437 Inference and Information
Teaching Assistant

EECS, MIT
Spring 2011

- **Instructors:** Prof. P. Golland, Prof. G. W. Wornell
- Led recitations, wrote problem sets and exams, and held office hours for the graduate-level statistical inference course.

PROFESSIONAL
SERVICE

- Reviewer for the International Symposium on Network Coding (NetCod): 2011
- Reviewer for the International Symposium on Information Theory (ISIT): 2012—2015
- Reviewer for IEEE Transaction on Information Theory
- Reviewer for IEEE Transaction on Communications
- Reviewer for IEEE Communications Letters

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| WORK EXPERIENCES | Two Sigma Investments <i>Research Analyst</i> | New York, NY Aug. 2014–present |
| | <ul style="list-style-type: none"> Predictive modeling with large amount of unstructured data. | |
| | Two Sigma Investments <i>Quantitative Research Intern</i> | New York, NY Jun. 2013–Aug. 2013 |
| | <ul style="list-style-type: none"> Conducted quantitative behavioral research for equity markets. | |
| | OANDA Corp. <i>Quantitative Analyst Intern</i> | Toronto, ON Jun. 2012–Aug. 2012 |
| | <ul style="list-style-type: none"> Researched high frequency currency data at OANDA, a global forex market marker. Developed prediction algorithms to reduce the transaction cost of currency rejections. Investigated dynamic exposure hedging strategies for currency risk management. | |
| | Swipely Inc. <i>Intern Engineer</i> | Providence, RI Jun. 2011–Aug. 2011 |
| | <ul style="list-style-type: none"> Developed a statistical inference algorithm to identify merchants from highly noisy and heterogeneous credit/debit card transaction records, with significant accuracy improvement over the existing system for a large number of banks. | |
| | Bain Capital Absolute Return Capital (ARC) <i>Intern Analyst</i> | Boston, MA Jun. 2010–Aug. 2010 |
| | <ul style="list-style-type: none"> Developed software for <i>large scale option data management</i> and <i>option pricing analysis</i>. | |
| | Mitsubishi Electric Research Lab (MERL) <i>Intern Researcher</i> | Cambridge, MA Jun. 2009–Aug. 2009 |
| | <ul style="list-style-type: none"> Researched and implemented in Python a constraint satisfaction algorithm named “divide and concur”, and applied it to <i>infer 3D human motion from 2D video segments</i>. | |
| | Altera Corporation: Toronto Technology Center <i>Intern Engineer</i> | Toronto, ON, Canada May 2006–May 2007 |
| | <ul style="list-style-type: none"> FPGA CAD development in C++ and FPGA-based embedded system development. | |
| RECENT AWARDS AND FELLOWSHIPS | <ul style="list-style-type: none"> Wellington and Irene Loh Fund Graduate Fellowship, MIT | 2013 |
| | <ul style="list-style-type: none"> Claude E. Shannon Research Assistantship, Research Laboratory of Electronics, MIT | 2011 |
| | <ul style="list-style-type: none"> NSERC Postgraduate Scholarship (Master & Doctoral level), Natural Sciences and Engineering Research Council of Canada | 2009 & 2010 |
| | <ul style="list-style-type: none"> Hewlett Packard Fellowship, MIT | 2009 |
| | <ul style="list-style-type: none"> MIT Irwin M. Jacobs and Joan K. Jacobs Presidential Fellowship, MIT | 2008 |
| | <ul style="list-style-type: none"> William L. Everitt Student Award of Excellence, International Engineering Consortium | 2008 |
| AFFILIATIONS & ACTIVITIES | <ul style="list-style-type: none"> EECS representative, <i>MIT Graduate Student Council (GSC)</i> | Fall 2012–Spring 2012 |
| | <ul style="list-style-type: none"> Co-organizer, <i>RLE Information & Signals Seminar Series (ISSS)</i> | Spring 2010–Fall 2011 |
| | <ul style="list-style-type: none"> VP Academic, <i>EECS Graduate Student Association (GSA)</i>, MIT | 2010 |
| | <ul style="list-style-type: none"> - Led a five-member team to organize academic and career events for EECS graduate students. | |
| | <ul style="list-style-type: none"> Student organizer, <i>6.454 Graduate Seminar in Area I</i>, MIT | Fall 2009 |