Bobak Nazer

Mail: 8 Saint Mary's Street, Boston, MA 02215 USA
Email: bobak@bu.edu   Tel: 617-358-5858   Web: https://bobaknazer.github.io

EDUCATION		
	University of California, Berkeley	
	PhD Electrical Engineering and Computer Sciences	2009
	Advisor: Prof. Michael Gastpar	
	Dissertation Title: Exploiting Interference through Algebraic Structure	
	MS Electrical Engineering and Computer Sciences	2005
	Advisor: Prof. Michael Gastpar	
	Rice University	
	BS Electrical and Computer Engineering	2003

EMPLOYMENT		
	Boston University	
	Associate Professor	2018 - Present
	Department of Electrical and Computer Engineering	
	Distinguished Faculty Fellow	2019 - 2024
	College of Engineering	
	Affiliated Faculty Member	2011 - Present
	Center for Information and Systems Engineering	
	Division of Systems Engineering	
	Assistant Professor	2011 - 2018
	Department of Electrical and Computer Engineering	
	University of Wisconsin, Madison	
	Postdoctoral Research Associate	2009 − 2010
	Department of Electrical and Computer Engineering	
	Hosts: Prof. Robert D. Nowak and Prof. Stark C. Draper	

SELECTED AWARDS		
	Distinguished Faculty Fellow	2019 - 2024
	College of Engineering, Boston University	
	ECE Outstanding Faculty Teaching Award	2018
	Department of Electrical and Computer Engineering, Boston University	
	ECE Faculty Service Award	2017
	Department of Electrical and Computer Engineering, Boston University	
	Dean's Catalyst Award	2017
	College of Engineering, Boston University	
	Joint Paper Award	2013
	IEEE Communications Society and Information Theory Society	
	NSF CAREER Award	2013
	National Science Foundation	
	Dean's Catalyst Award	2011
	College of Engineering, Boston University	

Eli Jury Award for Outstanding Achievement in Systems, Communications, Control, or Signal Processing EECS Department, University of California, Berkeley	2009
Finalist for ISIT Best Student Paper Award Information Theory Society	2009
Outstanding Graduate Student Instructor EECS Department, University of California, Berkeley	2004
NSF Graduate Research Fellowship National Science Foundation	2004
Outstanding Senior in Engineering Rice Engineering Alumni Association	2003
National Merit Scholar National Merit Scholarship Corporation	1999

GRANT FUNDING

CURRENT

CIF: Medium: Discovering Changes in Networks: Fundamental Limits, Efficient Algorithms, and Large-Scale Neuroscience,
National Science Foundation (CCF-1955981), 7/1/20 - 6/30/24,
Lead PI with Co-PIs Prof. Venkatesh Saligrama (BU) and Prof. Xue Han (BU),
Total: $1,199,997 + REU Supplement: $32,000.

PREVIOUS

Convergence: RAISE Integrating machine learning and biological neural networks ,
National Science Foundation (CBET-1848029), 10/1/18 - 9/30/22,
Co-PI with Lead PI Prof. Xue Han (BU) and Co-PI Ed Boyden (MIT),
Total: $999,000.

CIF: Small: Algebraic Network Information Theory,
National Science Foundation (CCF-1618800), 6/15/16 - 5/31/21,
Sole PI,
Total: $499,995 + REU Supplement: $27,500.

Understanding Large-Scale Neural Data: Theory, Algorithms, and Experimental Design Insights,
Dean's Catalyst Award, Boston University College of Engineering, 6/1/17 - 5/31/19,
Lead PI with Co-PIs Prof. Xue Han (BU) and Prof. Venkatesh Saligrama,
Total: $78,000, BU Share: $78,000.

CAREER: Harnessing Interference Structure in Networks,
National Science Foundation (CCF-1253918), 2/1/13 - 1/31/18,
Sole PI,
Total: $496,102, BU Share: $496,102.

CIF: Small: Collaborative Research: Exploring Synergies of Multi-State Networks,
National Science Foundation (CCF-1320773), 9/1/13 - 8/31/17,
Lead PI with Co-PI Prof. Syed Jafar (UCI),
Total: $499,747, BU Share: $249,954.

CIF: Medium: Collaborative Research: Interference-Aware Cooperation via Structured Codes: Creating an Empirical Cycle,
National Science Foundation (CCF-1302600), 8/1/13 - 7/31/17,
Lead PI with Co-PIs Prof. Behnaam Aazhang (Rice) and Prof. Krishna Narayanan (Texas A&M),

Total: $1,097,358, BU Share: $387,473, REU Supplement: $10,800.

Application-Specific Noisy Processors: Weaving Nearly Reliable Circuits from an Unreliable Fabric,
Dean's Catalyst Award, Boston University College of Engineering, 5/1/11 - 4/30/12,
Co-PI with Lead PI Prof. Ajay Joshi (BU),
Total: $38,000, BU Share: $38,000.

Subaward from *Computation Codes - A New Tool for Multi-user Communication,*
National Science Foundation (CCF-0830428), 9/1/11 - 11/30/12,
Lead PI Prof. Michael Gastpar (Berkeley/EPFL),
Total Subaward to BU: $102,863.

RESEARCH GROUP

CURRENT

PhD Students

Zeynep Kahraman, BS Bogazici University,
ECE Department, Fall 2018 - present.

Nicholas Sacco, BS/MS University of Massachusetts, Lowell
ECE Department, Fall 2020 - present.

ALUMNI

Past Postdoctoral Scholars

Dr. Or Ordentlich, BS/MS/PhD Tel Aviv University,
Co-hosted with Prof. Yury Polyanskiy (MIT), 2015 - 2017.
Current Position: Associate Professor, Hebrew University of Jerusalem.
Website: `https://www.orordentlich.net`

Dr. Viveck R. Cadambe, BS/MS IIT Madras, PhD University of California, Irvine,
Co-hosted with Prof. Muriel Médard (MIT), 2011 - 2014,
Current Position: Associate Professor at Penn State University.
Website: `http://www.ee.psu.edu/viveck/`

Dr. Chen Feng, BS Shanghai Jiao Tong, MS/PhD University of Toronto,
NSERC Postdoctoral Fellow co-hosted with Prof. Michael Gastpar (EPFL), 2014 - 2015,
BU Visit: Nov. 2014 - Feb. 2015, EPFL Visit: Mar. 2015 - Jun. 2015,
Current Position: Associate Professor at the University of British Columbia, Kelowna.
Website: `https://people.ok.ubc.ca/cfeng01/`

Graduated PhD Students

Dr. Aditya Gangrade, BTech IIT Bombay, PhD Boston University
SE Division, 2015 - 2021. Co-advised with Prof. Venkatesh Saligrama,
Dissertation Title: Two Studies in Resource-Efficient Inference: Structural Testing of Networks, and Selective Classification,
Current Position: Postdoctoral Fellow at Carnegie Mellon University, supervised by Prof. Aditya Ramdas and Prof. Alessandro Rinaldo.
Website: `https://adityagangrade.wordpress.com`

Dr. Kyle Hansen, BS University of Utah, MS/PhD Boston University
BME Department, 2014 - 2019, Co-Advisor with Primary Advisor: Prof. Xue Han,
Dissertation Title: Neuronal Population and Network Analysis Tools for Large Scale Calcium Imaging Datasets,
Current Position: Staff Data Scientist at Recursion Pharmaceuticals.

Dr. Islam El Bakoury, BS/MS Alexandria University, PhD Boston University

ECE Department, 2013 - 2019,
Dissertation Title: Integer-Forcing for Cloud-Radio Access Networks: Compression, Equalization, and Uplink-Downlink Duality,
Current Position: Qualcomm.

Dr. Michael Farag, BS Alexandria University, MS/PhD Boston University,
ECE Department, 2011 - 2016,
Dissertation Title: Interference Alignment: Capacity Bounds and Practical Algorithms for Time-Varying Channels,
Current Position: Quantlab.

Dr. Wenbo He, BS New York University, MS/PhD Boston University,
ECE Department, 2011 - 2016,
Dissertation Title: Integer-Forcing in Multiterminal Coding: Uplink-Downlink Duality and Source-Channel Duality,
Current Position: Principal Software Engineer at Mathworks.

Graduated MS Students

Steve Wang, BS University of California, Berkeley, MS Boston University,
ECE Department, 2015 - 2016,
Current Position: Software Engineer at Google.

Kate Thurmer, BU LEAP student, MS Boston University,
ECE Department, 2013 - 2014,
Current Position: PhD student at University of Toronto.

Past Undergraduate Research Supervision

Pratima Vaidyanathan, BS Candidate Boston University,
ECE Undergraduate, Summer 2020 research supported by NSF REU supplement.

Elisa Cordeiro Lopes, BS Candidate Boston University,
BME Undergraduate, Summer 2020 research supported by NSF REU supplement.

Rockwell Tang, BS Candidate Boston University,
BME Undergraduate, Summer 2020 research supported by NSF REU supplement.

Artemis Margaronis, BS Candidate Boston University,
BME Undergraduate, Summer 2020 research supported by NSF REU supplement.

Rosangel Ramos Espinoza, BS Candidate Boston University,
BME Undergraduate, Summer 2020 research supported by NSF REU supplement.

Aviva Englander, BS Boston University,
ECE Undergraduate, Summer 2017 research supported by NSF REU supplement.

Biyao Liang, BS Boston University,
ECE Undergraduate, Summer 2017 research supported by NSF REU supplement.

Sparsh Kumar, BS Boston University,
ECE Undergraduate, Summer 2015 research funded by NSF REU supplement.

Jooyoun Hong, BS Boston University,
ECE Undergraduate, Summer 2015 research funded by NSF REU supplement.

Erik Lindgren, BS Boston University,
ECE Undergraduate, Senior Honors Thesis, NSF Graduate Fellowship, 2013 - 2014,
Current Position: PhD Student supervised by Prof. Alex Dimakis (UT-Austin).

Past Visitors

Corina Ionita, PhD Candidate Rice University,
Visited while PhD student of Prof. Behnaam Aazhang (Rice University), August 2014 - December 2017.

Prof. Sidharth Jaggi, Associate Professor at the Chinese University of Hong Kong,
CISE Resident Scholar, April - August 2016.

Dr. Vasileios Ntranos,
Visited while PhD student of Prof. Giuseppe Caire (USC), March - November 2012.

Dr. Matthew Nokleby,
Visited while PhD student of Prof. Behnaam Aazhang (Rice University), March 2012.

PUBLICATIONS

BOOK CHAPTERS

(BC1) S. H. Lim, B. Nazer, and M. Gastpar, *Compute–Forward Strategies for Next-Generation Wireless Systems* in *Information-Theoretic Perspectives on 5G Systems and Beyond*, Cambridge, UK: Cambridge University Press, 2022.

(BC2) O. Ordentlich and B. Nazer, *Characterizing the Performance of Wireless Communication Architectures via Basic Diophantine Approximation Bounds* in Number Theory Meets Wireless Communications, V. Berenesvich, A. Burr, B. Nazer, and S. Velani, Springer, 2020.

(BC3) B. Nazer and R. Zamir, *Gaussian Networks* in R. Zamir (author), *Lattice Coding for Signals and Networks*, Cambridge, UK: Cambridge University Press, 2014.

JOURNAL PAPERS

(J1) A. Pastore, S. H. Lim, C. Feng, B. Nazer, and M. Gastpar, *A Unified Discretization Approach to Compute– Forward: From Discrete to Continuous Inputs*, IEEE Transactions on Information Theory, vol. 69, no. 1, pp. 1-45, January 2023.

(J2) R. A. Mount, S. Sridhar, K. R. Hansen, A. I. Mohammed, M. Abdulkerim, R. Kessel, B. Nazer, H. J. Gritton, X. Han, *Distinct neuronal populations contribute to trace conditioning and extinction learning in the hippocampal CA1*, eLife 2021 10, e56491, April 2021.

(J3) A. Bhatt, B. Nazer, O. Ordentlich, and Y. Polyanskiy, *Information-Distilling Quantizers*, IEEE Transactions on Information Theory, vol. 67, no. 4, pp. 2472-2487, February 2021.

(J4) S. H. Lim, C. Feng, A. Pastore, B. Nazer, and M. Gastpar, *Towards an Algebraic Network Information Theory: Simultaneous Joint Typicality Decoding*, IEEE Transactions on Information Theory, vol. 66, no. 10, pp. 6242-6255, October 2020.

(J5) I. El Bakoury and B. Nazer, *Integer-Forcing Architectures for Uplink Cloud Radio Access Networks*, IEEE Transactions on Wireless Communications, vol. 19, no. 4, pp. 2336-2351, April 2020.

(J6) S. H. Lim, C. Feng, A. Pastore, B. Nazer, and M. Gastpar, *A Joint Typicality Approach to Compute–Forward*, IEEE Transactions on Information Theory, vol. 64, no. 12, pp. 7657-7685, December 2018.

(J7) K. Hansen, G. DeWalt, A. Mohammad, H. Tseng, V. Saligrama, B. Nazer, W. Eldred, and X. Han, *Mild Blast Injury Produces Acute Changes in Basal Intracellular Calcium Levels and Activity Patterns in Mouse Hippocampal Neurons*, Journal of Neurotrauma, vol. 35, no. 13, pp. 1523-1536, July 2018.

(J8) W. He, B. Nazer, and S. Shamai, *Uplink-Downlink Duality for Integer-Forcing*, IEEE Transactions on Information Theory, vol. 64, no. 3, pp. 1992-2011, March 2018.

(J9) B. Nazer, V. Cadambe, V. Ntranos, and G. Caire, *Expanding the Compute-and-Forward Framework: Unequal Powers, Signal Levels, and Multiple Linear Combinations*, IEEE Transactions on Information Theory, vol. 62, no. 9, pp. 4879-4909, September 2016.

(J10) J. Zhan, B. Nazer, U. Erez, and M. Gastpar, *Integer-Forcing Linear Receivers*, IEEE Transactions on Information Theory, vol. 60, no. 12, pp. 7661-7685, December 2014.

(J11) O. Ordentlich, U. Erez, and B. Nazer, *The Approximate Sum Capacity of the Symmetric K-User Gaussian Interference Channel*, IEEE Transactions on Information Theory, vol. 60, no. 6, pp. 3450-3482, June 2014.

(J12) U. Niesen, B. Nazer, and P. Whiting, *Computation Alignment: Capacity Approximation without Noise Accumulation*, IEEE Transactions on Information Theory, vol. 59, no. 6, pp. 3811-3832, June 2013.

(J13) B. Nazer, Y. Shkel, and S. C. Draper, *The AWGN Red Alert Problem*, IEEE Transactions on Information Theory, vol. 49, no. 4, pp. 2188-2200, April 2013.

(J14) B. Nazer, M. Gastpar, S. A. Jafar, and S. Vishwanath, *Ergodic Interference Alignment*, IEEE Transactions on Information Theory, vol. 58, no. 10, pp. 6355-6371, October 2012.

(J15) B. Nazer and M. Gastpar, *Compute-and-Forward: Harnessing Interference through Structured Codes*, IEEE Transactions on Information Theory, vol. 57, no. 10, pp. 6463-6486, October 2011.

(J16) B. Nazer, A. G. Dimakis, and M. Gastpar, *Local Interference can Accelerate Gossip Algorithms*, IEEE Journal of Selected Topics in Signal Processing, Special Issue on Gossiping Algorithms Design and Application, vol. 5, no. 5, pp. 876-887, August 2011.

(J17) B. Nazer and M. Gastpar, *Reliable Physical-Layer Network Coding.* Proceedings of the IEEE, Special Issue on Network Coding, vol. 99, no. 3, pp. 438-460, March 2011.

(J18) B. Nazer and M. Gastpar, *The Case for Structured Random Codes in Network Capacity Theorems*, European Transactions on Telecommunications, Special Issue on New Directions in Information Theory, vol.19, no.4, pp. 455-474, June 2008.

(J19) B. Nazer and M. Gastpar, *Computation over Multiple-Access Channels*, IEEE Transactions on Information Theory, Special Issue on Models, Theory, and Codes for Relaying and Cooperation in Communication Networks, vol. 53, no. 10, pp. 3498-3516, October 2007.

PREPRINTS

CONFERENCE
PROCEEDINGS

(C1) A. Pastore, S. H. Lim, C. Feng, B. Nazer, and M. Gastpar, *Distributed Lossy Computation with Structured Codes: From Discrete to Continuous Sources*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2023), Taipei, Taiwan, June 2023.

(C2) Z. K and B. Nazer, *Detecting Correlated Gaussian Databases*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2022), Espoo, Finland, June 2022.

(C3) A. Pastore, S. H. Lim, C. Feng, B. Nazer, and M. Gastpar, *A Discretization Approach to Compute–Forward*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2021), Online, July 2021.

(C4) A. Gangrade, B. Nazer, and V. Saligrama, *Limits on Testing Structural Changes in Ising Models*, Advances in Neural Information Processing Systems (NeurIPS 2020), Online, December 2020.

(C5) A. Gangrade, P. Venkatesh, B. Nazer, and V. Saligrama, *Efficient Near-Optimal Testing of Community Changes in Balanced Stochastic Block Models*, Advances in Neural Information Processing Systems (NeurIPS 2019), Vancouver, Canada, December 2019.

(C6) S. H. Lim, C. Feng, A. Pastore, B. Nazer, and M. Gastpar, *Towards an Algebraic Network Information Theory: Distributed Lossy Computation of Linear Functions*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2019), Paris, France, July 2019.

(C7) I. E. Bakoury and B. Nazer, *Uplink-Downlink Duality For Integer-Forcing in Cloud Radio Access Networks*, Proceedings of 56th Annual Allerton Conference on Communications, Control and Computing, Monticello, IL, October 2018.

(C8) A. Gangrade, B. Nazer, and V. Saligrama, *Two-Sample Testing can be as hard as Structure Learning in Ising Models: Minimax Lower Bounds*, Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2018), Calgary, Canada, April 2018.

(C9) A. Gangrade, B. Nazer, and V. Saligrama, *Lower Bounds for Two-Sample Structural Change Detection in Ising and Gaussian Models*, Proceedings of 55th Annual Allerton Conference on Communications, Control and Computing, Monticello, IL, October 2017.

(C10) I. E. Bakoury and B. Nazer, *Integer-forcing architectures for uplink cloud radio access networks*, Proceedings of 55th Annual Allerton Conference on Communications, Control and Computing, Monticello, IL, October 2017.

(C11) B. Nazer, O. Ordentlich, and Y. Polyanskiy, *Information-Distilling Quantizers*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2017), Aachen, Germany, July 2017.

(C12) S. H. Lim, C. Feng, A. Pastore, B. Nazer, and M. Gastpar, *Towards an Algebraic Network Information Theory: Simultaneous Joint Typicality Decoding*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2017), Aachen, Germany, July 2017.

(C13) C. Ionita, B. Nazer, C. Feng, and B. Aazhang, *An Experimental Study on the Robustness of Integer-Forcing Linear Receivers*, Proceedings of the IEEE International Conference on Communications (ICC 2017), Budapest, Hungary, June 2017.

(C14) B. Nazer and O. Ordentlich, *Diophantine Approximation for Network Information Theory: A Survey of Old and New Results*, Proceedings of the 54th Annual Allerton Conference on Communication, Control and Computation, Monticello, IL, October 2016. (*Invited.*)

(C15) W. He and B. Nazer, *Integer-Forcing Source Coding: Successive Cancellation and Source-Channel Duality*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2016), Barcelona, Spain 2016.

(C16) W. He, B. Nazer, and S. Shamai (Shitz), *Dirty-Paper Integer-Forcing*, Proceedings of the 53rd Annual Allerton Conference on Communication, Control and Computation, Monticello, IL, October 2015.

(C17) S. H. Lim, C. Feng, B. Nazer, and M. Gastpar, *A Joint Typicality Approach to Compute-Forward*, Proceedings of the 53rd Annual Allerton Conference on Communication, Control and Computation, Monticello, IL, October 2015. (*Invited.*)

(C18) W. He, C. Feng, and B. Nazer, *Short Paper: Collision Scheduling for Cellular Networks with Spatial Connectivity Constraints*, Proceedings of the 82nd IEEE Vehicular Technology Conference (VTC 2015-Fall), Boston, MA September 2015.

(C19) I. El Bakoury, W. He, and B. Nazer, *Integer-Forcing Interference Alignment: Iterative Optimization via Aligned Lattice Reduction*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2015), Hong Kong, China, June 2015.

(C20) I. El Bakoury and B. Nazer, *The Impact of Channel Variation on Integer-Forcing Receivers*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2015), Hong Kong, China, June 2015.

(C21) M. Farag and B. Nazer, *Matching Alignment*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2015), Hong Kong, China, June 2015.

(C22) W. He, C. Feng, C. Ionita, and B. Nazer, *Collision Scheduling for Cellular Networks*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2015), Hong Kong, China, June 2015.

(C23) O. Ordentlich, U. Erez, and B. Nazer, *Compute-and-Forward with Feedback*, Proceedings of the IEEE Information Theory Workshop (ITW 2015), Jerusalem, Israel, April 2015. (*Invited.*)

(C24) B. Nazer and M. Gastpar, *Compute-and-Forward for Discrete Memoryless Networks*, Proceedings of the IEEE Information Theory Workshop (ITW 2014), Hobart, Australia, November 2014. (*Invited.*)

(C25) W. He, B. Nazer, and S. Shamai (Shitz), *Uplink-Downlink Duality for Integer-Forcing: Effective SINRs and Iterative Optimization*, Proceedings of the 15th IEEE International Symposium on Signal Processing Advances in Wireless Communications (SPAWC 2014), Toronto, Canada, June 2014.

(C26) W. He, B. Nazer, and S. Shamai (Shitz), *Uplink-Downlink Duality for Integer-Forcing*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2014), Honolulu, HI July 2014.

(C27) V. Ntranos, V. R. Cadambe, B. Nazer, and G. Caire, *Asymmetric Compute-and-Forward*, Proceedings of the 51st Annual Allerton Conference on Communication, Control and Computation, Monticello, IL, October 2013.

(C28) O. Ordentlich, U. Erez, and B. Nazer, *Successive Integer-Forcing and its Sum-Rate Optimality*, Proceedings of the 51st Annual Allerton Conference on Communication, Control and Computation, Monticello, IL, October 2013.

(C29) M. Nokleby and B. Nazer, *Amplify-and-Compute: Function Computation over Layered Networks*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2013), Istanbul, Turkey, July 2013.

(C30) M. Farag and B. Nazer, *The Symmetric Ergodic Capacity of Phase-Fading Interference Channels to within a Constant Gap: 3 Users in the Strong and Very Strong Regimes*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2013), Istanbul, Turkey, July 2013.

(C31) V. Ntranos, V. R. Cadambe, B. Nazer, and G. Caire, *Integer-Forcing Interference Alignment*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2013), Istanbul, Turkey July 2013.

(C32) V. Ntranos, V. R. Cadambe, B. Nazer, and G. Caire, *Feedback Interference Alignment: Exact Alignment for Three Users in Two Time Slots*, Proceedings of the IEEE International Conference on Communications (ICC 2013), Budapest, Hungary, June 2013.

(C33) M. Nokleby, B. Nazer, and B. Aazhang, *Relay Computation: Managing Interference with Structure and Cooperation*, Proceedings of the 50th Annual Allerton Conference on Communication, Control and Computation, Monticello, IL, September 2012.

(C34) M. Nokleby, B. Nazer, B. Aazhang, and N. Devroye, *Relays that Cooperate to Compute*, Proceedings of the 9th International Symposium on Wireless Communication Systems (ISWCS 2012), Paris, France, August 2012. (*Invited.*)

(C35) O. Ordentlich, U. Erez, and B. Nazer, *The Approximate Sum Capacity of the Symmetric K-User Gaussian Interference Channel*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2012), Cambridge, MA, July 2012.

(C36) O. Ordentlich, U. Erez, and B. Nazer, *The Compute-and-Forward Transform*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2012), Cambridge, MA, July 2012.

(C37) A. Joshi, C. Chen, Z. Takhirov, B. Nazer, *A Multi-Layer Approach to Green Computing: Designing Energy-Efficient Digital Circuits and Manycore Architectures*, Proceedings of the 3rd International Green Computing Conference (IGCC 2012), San Jose, CA, June 2012. (*Invited.*)

(C38) J. Zhan, B. Nazer, U. Erez, and M. Gastpar, *Integer-Forcing Architectures: An Overview*, Proceedings of the 5th International Symposium on Communications, Control, and Signal Processing (ISCCSP 2012), Rome, Italy, May 2012. (*Invited.*)

(C39) B. Nazer, *Successive Compute-and-Forward*, Proceedings of the 22nd Biennial International Zurich Seminar on Communication (IZS 2012), Zurich, Switzerland, March 2012. (*Invited.*)

(C40) Z. Takhirov, B. Nazer, and A. Joshi, *Error Mitigation in Digital Logic using a Feedback Equalization with Schmitt Trigger (FEST) Circuit*, Proceedings of the International Symposium on Quality Electronic Design (ISQED 2012), Santa Clara, CA, March 2012.

(C41) U. Niesen, B. Nazer, and P. Whiting, *Computation Alignment: Capacity Approximation without Noise Accumulation*, Proceedings of the 49th Annual Allerton Conference on Communication, Control and Computation, Monticello, IL, September 2011.

(C42) Y. Shkel, S. C. Draper, and B. Nazer *On the Cooperative Red Alert Exponent for the AWGN-MAC with Feedback*, Proceedings of the 49th Annual Allerton Conference on Communication, Control and Computation, Monticello, IL, September 2011.

(C43) Z. Takhirov, B. Nazer, and A. Joshi, *A Preliminary Look at Error Avoidance in Digital Logic via Feedback Equalization*, Proceedings of the 49th Annual Allerton Conference on Communication, Control and Computation, Monticello, IL, September 2011. (*Invited.*)

(C44) O. Ordentlich, J. Zhan, U. Erez, M. Gastpar, and B. Nazer, *Practical Code Design for Compute-and-Forward*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2011), St. Petersburg, Russia, August 2011.

(C45) J. Zhan, U. Erez, M. Gastpar, and B. Nazer, *Mitigating Interference with Integer-Forcing Architectures*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2011), St. Petersburg, Russia, August 2011.

(C46) Y. Song, N. Devroye, and B. Nazer, *Inverse Compute-and-Forward: Extracting Messages from Simultaneously Transmitted Equations*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2011), St. Petersburg, Russia, August 2011.

(C47) B. Nazer and R. D. Nowak, *Efficient Designs for Multiple Gene Knockdown Experiments*, Proceedings of the 9th IEEE International Workshop on Genomic Signal Processing and Statistics (GENSIPS 2010), Cold Spring Harbor, NY, November 2010.

(C48) J. Zhan, B. Nazer, O. Ordentlich, U. Erez, and M. Gastpar, *Integer-Forcing Architectures for MIMO: Distributed Implementation and SIC*, Proceedings of the 44th Annual IEEE Asilomar Conference on Signals, Systems, and Computers, Monterey, CA, October 2010. (*Invited.*)

(C49) B. Nazer and R. D. Nowak, *Sparse Interactions: Identifying High-Dimensional Multilinear Systems via Compressed Sensing*, Proceedings of the 48th Annual Allerton Conference on Communication, Control and Computation, Monticello, IL, September 2010.

(C50) B. Nazer and S. C. Draper, *Gaussian Red Alert Exponents: Geometry and Code Constructions*, Proceedings of the 48th Annual Allerton Conference on Communication, Control and Computation, Monticello, IL, September 2010. (*Invited.*)

(C51) J. Zhan, B. Nazer, U. Erez, and M. Gastpar, *Integer-Forcing Linear Receivers: A New Low-Complexity MIMO Architecture*, Proceedings of the 72nd IEEE Vehicular Technology Conference (VTC 2010-Fall), Ottawa, Canada, September 2010.

(C52) J. Zhan, B. Nazer, U. Erez, and M. Gastpar, *Integer-Forcing Linear Receivers*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2010), Austin, TX, June 2010.

(C53) B. Nazer and M. Gastpar, *On Decoding Equations with Partial Channel State Information*, Proceedings of the 44th Annual IEEE Conference on Information Sciences and Systems (CISS 2010), Princeton, NJ, March 2010. (*Invited.*)

(C54) B. Nazer, S. C. Draper, and M. Gastpar, *Dynamic Rank Acquisition via Rateless Compute-and-Forward*, Proceedings of the IEEE Information Theory Workshop (ITW 2010), Cairo, Egypt, January 2010. (*Invited.*)

(C55) B. Nazer, M. Gastpar, S. A. Jafar, and S. Vishwanath, *Interference Alignment at Finite SNR: General Message Sets*, Proceedings of the 47th Annual Allerton Conference on Communication, Control and Computation, Monticello, IL, September 2009. (*Invited.*)

(C56) B. Nazer, M. Gastpar, S. A. Jafar, and S. Vishwanath, *Ergodic Interference Alignment*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2009), Seoul, Korea, June 2009. (**Finalist for Best Student Paper Award**)

(C57) J. Zhan, B. Nazer, M. Gastpar, and U. Erez, *MIMO Compute-and-Forward*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2009), Seoul, Korea, June 2009.

(C58) B. Nazer, A. Sanderovich, M. Gastpar, and S. Shamai, *Structured Superposition for Backhaul Constrained Cellular Uplink*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2009), Seoul, Korea, June 2009.

(C59) B. Nazer, A. G. Dimakis, and M. Gastpar, *Neighborhood Gossip: Concurrent Averaging through Local Interference*. Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2009), Taipei, Taiwan, April 2009.

(C60) B. Nazer and M. Gastpar, *Compute-and-Forward: A Novel Strategy for Cooperative Networks*, Proceedings of the 42nd Annual IEEE Asilomar Conference on Signals, Systems, and Computers, Monterey, CA, October 2008. (*Invited.*)

(C61) B. Nazer, A. G. Dimakis, and M. Gastpar, *Local Interference Can Accelerate Gossip Algorithms*. Proceedings of the 46th Annual Allerton Conference on Communication, Control and Computation, Monticello, IL, September 2008.

(C62) B. Nazer and M. Gastpar, *The Case for Structured Random Codes: Beyond Linear Models*. Proceedings of the 46th Annual Allerton Conference on Communication, Control and Computation, Monticello, IL, September 2008. (*Invited.*)

(C63) B. Nazer and M. Gastpar, *Compute-and-Forward: Harnessing Interference with Structured Codes*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2008), Toronto, Canada, July 2008.

(C64) B. Nazer and M. Gastpar, *Compute-and-Forward: Error-Correcting Codes for Wireless Network Coding on the Physical Layer*, Proceedings of the First IEEE International Workshop on Wireless Network Coding (WiNC 2008), San Francisco, CA, June 2008. (*Invited.*)

(C65) B. Nazer and M. Gastpar, *Structured Random Codes and Sensor Network Coding Theorems*. Proceedings of the 20th Biennial International Zurich Seminar on Communication (IZS 2008), Zurich, Switzerland, March 2008. (*Invited.*)

(C66) B. Nazer and M. Gastpar, *Lattice Coding Increases Multicast Rates for Gaussian Multiple-Access Networks*. Proceedings of the 45th Annual Allerton Conference on Communication, Control and Computation, Monticello, IL, September 2007.

(C67) B. Nazer and M. Gastpar, *The Case for Structured Random Codes in Network Communication Theorems*, Proceedings of the IEEE Information Theory Workshop (ITW 2007), Lake Tahoe, CA, September 2007. (*Invited.*)

(C68) A. D. Sarwate, B. Nazer and M. Gastpar, *Spatial Filtering in Sensor Networks with Computation Codes*, Proceedings of the IEEE Statistical Signal Processing Workshop (SSP 2007), Madison, WI, August 2007.

(C69) B. Nazer and M. Gastpar, *Computation over Gaussian Multiple-Access Channels*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2007), Nice, France, June 2007.

(C70) B. Nazer and M. Gastpar, *Computing over Multiple-Access Channels with Connections to Wireless Network Coding*, Proceedings of the IEEE International Symposium on Information Theory (ISIT 2006), Seattle, WA, July 2006.

(C71) B. Nazer and M. Gastpar, *Reliable Computation over Multiple-Access Channels*. Proceedings of the 43rd Annual Allerton Conference on Communication, Control and Computation, Monticello, IL, September 2005.

EDUCATIONAL (V1) B. Nazer and D. Castañón, *Videos for Probability, Statistics, and Data Science for Engineers*
VIDEOS (Boston University ENG EK381), YouTube Playlist:
`https://www.youtube.com/playlist?list=PLBV8cFFHvjMo21iuKoaO9n7P7ZXydFyx0`

INVITED TALKS

HALF-DAY *Compute-and-Forward: An Explicit Link between Finite Field and Gaussian Interference Net-*
TUTORIALS *works*, European School of Information Theory, Tallinn, Estonia, April 2014.

Algebraic Structure in Network Information Theory, IEEE International Symposium on Information Theory (ISIT 2011), St. Petersburg, Russia, August 2011.

Interference Alignment (for Interference Channels), Wireless Information Theory Summer School, Oulu, Finland, August 2011.

WORKSHOPS
Integer-Forcing for Cloud Radios
- 15th Annual Information Theory and Applications Workshop, San Diego, CA, February 2020.

Testing Changes in Communities for the Stochastic Block Model
- 14th Annual Information Theory and Applications Workshop, San Diego, CA, February 2019.

Towards an Algebraic Network Information Theory: II. Simultaneous Decoding
- Invited Session on Structured Codes in Network Information Theory, 52nd Annual Conference on Information Sciences and Systems, Princeton, NJ, March 2018.

Information-Distilling Quantizers
- 56th Annual Allerton Conference on Communications, Control, and Computing, Monticello, IL, October 2018.
- 12th Annual Information Theory and Applications Workshop, San Diego, CA, February 2017.

Towards an Algebraic Network Information Theory
- York Workshop on Interactions between Number Theory and Wireless Communications, July 2016.
- DIMACS Workshop on Network Coding: the Next 15 Years, Center for Discrete Mathematics and Theoretical Computer Science, December 2015.

Expanding the Compute-and-Forward Framework
- University of California, San Diego, 10th Annual Information Theory and Applications Workshop, February 2015.

Channel Coding for Interference Alignment: State-of-the-Art and Challenges
- ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc 2014), Workshop on Interference Alignment, August 2014.

Integer-Forcing: An Algebraic Approach to Interference Management
- IEEE Communications Theory Workshop, Interference Management Session, May 2014.

"Single-Letterization" of Gaussian Networks into Diophantine Approximation Problems
- York Workshop on Interactions between Number Theory and Wireless Communications, May 2014.

Towards an Algebraic Network Information Theory
- Charles River Information Theory Day, NSF Science of Information Center, April 2014.

Compute-and-Forward: Back to the DMC

- University of California, San Diego, 9th Annual Information Theory and Applications Workshop, February 2014.

Lattice Interference Alignment: State-of-the-Art and Challenges
- Asilomar Conference on Conference on Signals, Systems, and Computers, November 2013.

Compute-and-Forward: An Explicit Link between Finite Field and Gaussian Interference Networks
- IEEE International Symposium on Network Coding (Netcod), June 2013.

Integer-Forcing Interference Alignment
- University of California, San Diego, 8th Annual Information Theory and Applications Workshop, February 2013.

Integer-Forcing
- University of California, San Diego, 7th Annual Information Theory and Applications Workshop, February 2012.
- Banff International Research Station Workshop on Interactive Information Theory, January 2012.

Lattice Codes in AWGN Networks: What's Missing?
- Banff International Research Station Workshop on Algebraic Structure in Network Information Theory, August 2011.

The AWGN Red Alert Problem
- University of California, San Diego, 6th Annual Information Theory and Applications Workshop, February 2011.

Fading as Implicit Computation
- University of California, San Diego, 5th Annual Information Theory and Applications Workshop, February 2010.

Exploiting Interference through Structured Codes
- University of California, San Diego, 4th Annual Information Theory and Applications Workshop, Graduation Day, February 2009.

SEMINARS   *Detecting Structural Changes in Networks*
- Arizona State University, LIONS (Learning, Information, Optimization, Networks, Statistics) Seminar, October 2022.

Algebraic Network Information Theory: Techniques and Theorems for Harnessing Interference in Communication Networks
- Boston University, Electrical and Computer Engineering Seminar, April 2017.

Information-Distilling Quantizers
- Massachusetts Information of Technology, Signals, Information, and Algorithms Laboratory Group Meeting, March 2017.

Towards an Algebraic Network Information Theory
- Shannon Channel Online Seminar, June 2017, `https://youtu.be/_y1F8bMFDLY`
- Carnegie Mellon University, Energy and Information Seminar, March 2017.
- Tufts University, Electrical and Computer Engineering Seminar, October 2016.
- Worcester Polytechnic Institute, Electrical and Computer Engineering Seminar, April 2016.

Compute-and-Forward: An Explicit Link between Finite Field and Gaussian Interference Networks
- University of California - San Diego (UCSD), Information Theory and Applications Seminar, May 2014.

- University of Illinois at Urbana-Champaign (UIUC), Communications/ICWS Seminar, March 2014.
- Ecole Polytechnique Fédérale de Lausanne (EPFL), Information Processing Group Seminar, July 2013.

Harnessing Interference via Algebraic Structure
- Google, Wireless Tech Talk, June 2013.
- Massachusetts Institute of Technology, Laboratory for Information and Decision Systems Seminar, May 2013.

Harnessing Interference
- Qualcomm Seminar (Boxborough, MA), November 2012.
- Hebrew University of Jerusalem, Computer Science Colloquium, November 2012.
- Technion, Communication and Information Theory Seminar, November 2012.
- Army Research Laboratory Seminar, October 2012.
- University of Texas, Austin, Wireless Networking and Communications Group Seminar, April 2012.
- University of Massachusetts, Amherst, Electrical and Computer Engineering Seminar, April 2012.
- University of Toronto, Electrical and Computer Engineering Seminar, April 2012.
- University of Waterloo, Electrical and Computer Engineering Seminar, March 2012.
- Worcester Polytechnic Institute, Electrical and Computer Engineering Seminar, March 2013.

Exploiting Interference through Algebraic Structure
- Boston University, Center for Information and Systems Engineering Seminar, November 2011.

Harnessing Interference for Reliable Computation and Communication
- Bell Labs, March 2011.
- Massachusetts Institute of Technology, Signals, Information, and Algorithms Group Meeting, March 2011.
- University of Illinois, Chicago, Electrical and Computer Engineering Seminar, September 2010.
- Boston University, Electrical and Computer Engineering Seminar, March 2010.

Exploiting Interference through Structured Codes
- University of Illinois, Urbana-Champaign, Department of Electrical and Computer Engineering, Communications Seminar, October 2009.
- University of Wisconsin, Madison, Department of Electrical and Computer Engineering, Systems Seminar, April 2009.
- Harvard University, Electrical Engineering Seminar, April 2009.
- University of California, San Diego, 4th Annual Information Theory and Applications Workshop, Graduation Day, February 2009.

Structural Gain in Network Communication Theorems
- Texas A&M University, Department of Electrical and Computer Engineering, Networking Seminar, November 2007.
- Rice University, Department of Electrical and Computer Engineering Colloquium, March 2007.

TEACHING **Boston University**

ENG EK381: Probability, Statistics, and Data Science for Engineers
- Fall 2022, Spring 2022, Spring 2021, Fall 2020

ENG EC381: Probability Theory in Electrical and Computer Engineering
- Spring 2018, Spring 2017, Fall 2015, Spring 2015

ENG EC508: Wireless Communication
- Spring 2019, Fall 2016, Fall 2015, Fall 2014, Fall 2013

ENG EC517: Introduction to Information Theory
- Spring 2020, Spring 2014, Spring 2013, Spring 2012, Spring 2011

ENG EC515: Digital Communication
- Fall 2011

ENG EC700: Large-Scale Neural Data Analysis
- Fall 2017

ENG EC700: High-Dimensional Probability
- Fall 2021

SERVICE

Conference and Workshop Organization

North American Information Theory Summer School
General Chair for 2019 School hosted at Boston University.
Website: `http://iss.bu.edu/bobak/nasit`

Workshop on Interactions between Number Theory and Wireless Communication
One-week workshop hosted by the Department of Mathematics at York University, July 2016.
Co-organized with Victor Beresnevich, Alister Burr, and Sanju Velani, all at York University.

Nexus of Information and Computation Theories
Three-month program hosted by the Institut Henri Poincaré, Spring 2016.
Focused on the interface of information theory and theoretical computer science. Nearly 200
talk and tutorial videos available online. Co-organized with Mark Braverman (Princeton),
Anup Rao (UW), Aslan Tchamkerten (Télécom Paristech).
Website: `http://csnexus.info`

Workshop on Interference in Networks
One-day workshop (before ISIT 2012) at Boston University on information-theoretic approaches
to interference in wireless networks. Co-organized with Salman Avestimehr (USC).

Invited Session Organization

New Applications of Lattice Codes, IEEE Information Theory Workshop (ITW 2015 - Jerusalem),
April 2015, co-organized with Michael Gastpar (EPFL).

Algebraic Structure in Network Information Theory, IEEE Information Theory Workshop (ITW
2014 - Hobart), November 2014, co-organized with Brian Kurkoski (JAIST).

Interference Alignment, IEEE International Conference on Wireless Communications Systems
(ISWCS 2011), November 2011, co-organized with Syed Jafar (UC - Irvine).

Information Theory and Circuits, 49th Annual Allerton Conference on Communication, Con-
trol, and Computing, September 2011, co-organized with Lara Dolecek (UCLA).

Information Theory Society
- Outreach Committee (2012 - 2017)
- North American School of Information Theory: Publicity (2011), Web (2012), General Chair
  (2019).
- Student Committee: Student Co-Chair (2009 - 2010)

IEEE Communications Society

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- Poster Co-Chair for IEEE Communication Theory Workshop (2015)

Technical Program Committees
- IEEE International Symposium on Information Theory (ISIT 2013 - 2018, 2020 - 2023)
- IEEE Information Theory Workshop (ITW 2014)
- IEEE Global Communications Conference, Communication Theory Symposium (GLOBECOM 2014, 2015)
- IEEE International Conference on Communications, Wireless Communications Symposium (ICC 2011), Communications Theory Symposium (ICC 2013, 2014)
- IEEE International Symposium on Wireless Communications Systems (ISWCS 2011, 2012)
- IEEE International Symposium on Network Coding (Netcod 2013)
- International Symposium on Information Theory and its Applications (ISITA 2012)
- Canadian Workshop on Information Theory (CWIT 2017, 2019)

Reviewer
- IEEE Transactions on Information Theory, IEEE Transactions on Communications, IEEE Transactions on Wireless Communications, IEEE Transactions on Signal Processing, IEEE Communications Letters (Exemplary Reviewer in 2011), IEEE Selected Topics on Signal Processing and various conferences.

Boston University
- Publicity Committee, ECE Department, 2017 - 2019
- Responsible Conduct of Research Panels, 2016 - 2020
- EK100 Major Presentations, 2014 - 2020
- ECE Open House, ENG Challenge Leader, 2013 - 2019
- Search Committee, ECE Department, 2014, 2015, 2017, 2019, 2020, 2022
- Undergraduate Committee, ECE Department, 2021 - present
- Masters Committee, ECE Department, 2017 - 2018
- Doctoral Committee, ECE Department, 2016 - 2017, 2020
- Graduate Committee, ECE Department, 2011 - 2016
- Dean's Task Force on the ENG Undergraduate Curriculum, 2016 - 2017
- Convergence Task Force on Undergraduate Education, 2020 - 2021
- Ad Hoc Committee on Python for ENG Freshman Year, 2022
- Organizing Committee, CISE Seminar, 2014 - 2018

MEMBERSHIPS   IEEE, IEEE Information Theory Society, IEEE Communications Society, Phi Beta Kappa, Tau Beta Pi, Eta Kappa Nu.