A. Salman Avestimehr

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Research Interests

Information theory, communication theory, coding, distributed computing, and data sciences.

Education

- **UC Berkeley** — Berkeley, CA
  Ph.D. in EECS — *1/1/2006 - 8/1/2008*

- **UC Berkeley** — Berkeley, CA
  M.Sc in EECS — *8/1/2003 - 12/31/2005*

- **Sharif University of Technology** — Tehran, Iran
  B.Sc in EE — *7/1999-7/2003*

Positions Held

- **Electrical Engineering Department (EE)** — University of Southern California
  Full Professor — *12/1/2018 - now*

- **Electrical Engineering Department (EE)** — University of Southern California
  Associate Professor — *1/1/2014 - 12/1/2018*

- **Electrical Engineering Department (EE)** — California Institute of Technology
  Visiting Professor — *8/1/2016 - 12/31/2016*

- **School of Electrical and Computer Engineering (ECE)** — Cornell University
  Assistant Professor — *6/1/2009 - 12/31/2013*

- **Center for the Mathematics of Information (CMI)** — California Institute of Technology
  Postdoctoral Scholar — *8/1/2008 - 6/1/2009*

- **Wichorus Inc.** — San Jose, CA
  Scientist — *5/2007 - 8/2007 (part time)*

- **Qualcomm Inc.** — Campbell, CA
  Intern — *6/2005 - 8/2005*

Selected Honors and Awards

IEEE Information Theory Society James L. Massey Research & Teaching Award (2019)
Best Paper Award at 2017 IEEE Globecom Conference
Jack K. Wolf Best Student Paper Award (as advisor) at 2017 IEEE Int. Symp. Inf. Theory (ISIT)
Senior Member, IEEE, 2017
Okawa Foundation Award in Information and Telecommunications (2015)
Communications Society and Information Theory Society Joint Paper Award (2013)
Presidential Early Career Award for Scientists and Engineers (PECASE) from President Obama (2012)
Michael Tien Excellence in Teaching Award (2012)
US Air Force Young Investigator Program (YIP) Award (2011)
National Science Foundation CAREER award (2010)
Best PhD Thesis Award at Cornell ECE (as advisor, 2013)
David J. Sakrison Memorial Prize (Best PhD Thesis Award) from UC Berkeley (2008)
Vodafone-U.S. Foundation Fellows Initiative Research Merit Award (2005)
Best Student Paper Award Finalist (as advisor), 2011 IEEE Int. Symp. Inf. Theory (ISIT)
Qualcomm Innovation Award (as advisor, 2013)
Google PhD Fellowship (as advisor, 2018)
Ranked 1st in the EE Department of Sharif University of Technology (2002)
Ranked 1st and recipient of the best innovative award at AAAI (2002)
Presidential Award for Ranking 2nd in Iranian National Qualifying Exam from President Khatami (1999)
Recipient of silver medal in National Mathematical Olympiad (1998)

Major Professional Activities

- **Director:**

  Information Theory and Machine Learning (vITAL) Research Lab

- **Co-Director:**
  Communication Sciences Institute at USC, 2017 – now
  Wireless Health MS program at USC, 2014 – now

- **General Co-Chair:**
  IEEE International Symposium on Information Theory, 2020
  IEEE North American School of Information Theory, 2012
  Workshop on Interference Networks, 2012

- **Associate Editor:**
  IEEE Transactions on Information Theory, 2014-2017
  IEEE Transactions on Information Theory: Special Issue on Interference Networks, 2010-2011

PhD Students and Postdocs

- **4 in TT-academic positions** at University of Illinois Urbana Champaign - UIUC (ECE), Purdue University (EE), University of Colorado-Denver (EE), and IIT Hyderabad (EE).

- **6 in Industry** at Google, Intel, Youtube, Goldman Sachs, Dolby, and Micron Technologies.

PhD Students

- Ilan Shomorony (PhD, 2009-2013)

    - Thesis: Fundamentals Of Multi-Hop Multi-Flow Wireless Networks
    - Current Position: TT-assistant prof. at ECE Department of University of Illinois Urbana Champaign (UIUC).
    - Awards: Jack K. Wolf Student Paper Award Finalist, Simons Fellowship for Postdoctoral Studies, Qualcomm Innovation Award.

- Alireza Vahid (PhD, 2009-2013)

    - Thesis: The Impact Of Imperfect Feedback On The Capacity Of Wireless Networks
    - Current Position: TT-assistant prof. at EE Department of University of Colorado Denver
    - Awards: Best PhD Thesis Award, Best Teaching Assistant Award, Qualcomm Innovation Award.

- Sina Lashgari (PhD, 2010-2014)

    - Thesis: Fundamental Impacts Of Delay And Deadline On Communications Over Wireless Networks
    - Current Position: Program Trading Strategist at Goldman Sachs
    - Awards: ECE Department Fellowship

- Amandy Nwana (PhD, 2010-2014)

    - Thesis: Exploiting Latent User Behavior In Social Media Prediction
    - Current Position: Researcher at YouTube
    - Awards: ECE Department Fellowship

- Navid Naderializadeh (PhD, 2011-2016)

    - Thesis: Fundamentals of Two User-Centric Architectures for 5G: Device-to-Device Communication and Cache-Aided Interference Management
    - Current Position: Research Scientist at Intel Labs
    - Awards: MHI PhD Scholar at USC EE (top five PhD students of the EE Dept.), Shannon Centennial Competition Finalist at Bell Labs, Bronze Prize at 23rd Samsung Electronics HumanTech Paper Contest, Best Pitch Award at MHI Research Festival.

- Songze Li (PhD, 2012-2018)

- Thesis: Coded Computing: Mitigating Fundamental Bottlenecks in Large-Scale Data Analytics
- Current Position: Postdoctoral Scholar
- Awards: EE Department Fellowship, Qualcomm Innovation Award Finalist.

- Mehrdad Kiamari (PhD, 2014-2019 (expected))

  - Thesis Topic: Wireless Edge Computing
  - Current Position: Research Assistant
  - Awards: Best Paper Award at Globecomm Conference

- Qian Yu (PhD, 2015-2019 (expected))

  - Thesis Topic: Coded Computing
  - Current Position: Research Assistant
  - Awards: Jack K. Wolf Student Paper Award, Google Fellowship in Machine Learning, Qualcomm Innovation Award Finalist.

- Saurav Prakash (PhD started in 2016)

  - Thesis Topic: Coding for Large Scale Graph Analytics
  - Current Position: Research Assistant
  - Awards: EE Department Fellowship

- Chien-Shen Yang (PhD started in 2016)

  - Thesis Topic: Coded Computing in Dynamic Networks
  - Current Position: Research Assistant
  - Awards: EE Department Fellowship

- Mohammadreza Mousavi Kalan (PhD started in 2016, co-advised)

  - Thesis Topic: Gradient Methods in Machine Learning
  - Current Position: Research Assistant
  - Awards: Travel Award from 2018 IPDPS Conference.

- Jinhyun So (PhD started in 2017)

  - Thesis Topic: Non-Linear Coded Computing
  - Current Position: Research Assistant
  - Awards: EE Department Fellowship

Postdocs

- David Kao (2013-2015, current position: Research Scientist at Google)

- Aly El Gamal (2014-2015, current position: TT-assistant prof. in EE Department of Purdue University)

- Silas Fong (2014-2015, current position: Postdoc at University of Toronto)

- Eyal En Gad (2015-2016, current position: Research Scientist at Micron Technology)

- Aditya Siripuram (2016-2017, current position: TT-assistant prof. in EE Department of IIT Hyderabad)

- Mingchao (Fisher) Yu (2017-TBD, current position: Staff Engineer, Dolby Laboratory)

- Basak Guler (2017-TBD, current position: Postdoctoral Scholar)

- Saied Sahraei (2018-TBD, current position: Postdoctoral Scholar)

- Fatemeh Arbabjolfaei (2019-TBD, current position: Postdoctoral Scholar)

Teaching Experiences

- **Electrical Engineering Department** — University of Southern California
  EE364: Introduction to Probability and Statistics — *Fall 2018*

- **Electrical Engineering Department** — University of Southern California
  EE565: Information Theory and Data Compression — *Spring 2018*

- **Electrical Engineering Department** — University of Southern California
  EE503: Probability for Electrical and Computer Engineers — *Fall 2017*

- **Electrical Engineering Department** — University of Southern California
  EE565: Information Theory and Data Compression — *Spring 2016*

- **Electrical Engineering Department** — University of Southern California
  EE503: Probability for Electrical and Computer Engineers — *Fall 2015*

- **Electrical Engineering Department** — University of Southern California
  EE565a: Information Theory — *Spring 2015*

- **Electrical Engineering Department** — University of Southern California
  EE562a: Random Processes in Engineering — *Fall 2014*

- **Electrical Engineering Department** — University of Southern California
  EE565b: Information Theory — *Spring 2014*

- **School of Electrical and Computer Engineering (ECE)** — Cornell University
  ECE3100: Probability and Inference — *Fall 2013*

- **School of Electrical and Computer Engineering (ECE)** — Cornell University
  ECE5630: Fundamentals of Information Transmission — *Spring 2013*

- **School of Electrical and Computer Engineering (ECE)** — Cornell University
  ECE4110: Random Signals in Communications and Signal Processing — *Fall 2012*

- **School of Electrical and Computer Engineering (ECE)**   Cornell University
  ECE4670/5670: Digital Communications   *Spring 2012*
- **School of Electrical and Computer Engineering (ECE)**   Cornell University
  ECE4110: Random Signals in Communications and Signal Processing   *Fall 2011*
- **School of Electrical and Computer Engineering (ECE)**   Cornell University
  ECE5670: Digital Communications   *Spring 2011*
- **School of Electrical and Computer Engineering (ECE)**   Cornell University
  ECE4110: Random Signals in Communications and Signal Processing   *Fall 2010*
- **School of Electrical and Computer Engineering (ECE)**   Cornell University
  ECE5980: Advanced Topics in Network Information Flow   *Spring 2010*
- **School of Electrical and Computer Engineering (ECE)**   Cornell University
  ECE5950: Probabilistic Methods in Communication Networks   *Spring 2010*
- **School of Electrical and Computer Engineering (ECE)**   Cornell University
  ECE5670: Digital Communications   *Fall 2009*

Publications

Bold font indicates the student or postdoc co-author who was advised by me at time of project work.

Monographs, Book Chapters, and News Articles

1. "An Approximation Approach to Network Information Theory," by **A. S. Avestimehr**, S. Diggavi, C. Tian and D. Tse, Foundations and Trends in Communications and Information Theory, 2015. doi: 10.1561/0100000042.

2. "Multihop Wireless Networks: A Unified Approach to Relaying and Interference Management," by **I. Shomorony** and **A. S. Avestimehr**, Foundations and Trends in Networking, Now Publishing, Dec. 2014. doi: 10.1561/1300000044.

3. "Distributed Caching for Enhancing Communications Efficiency," by **A. S. Avestimehr** and A. Molisch, in Fog for 5G and IoT (eds M. Chiang, B. Balasubramanian and F. Bonomi), John Wiley & Sons, Inc., March 2017. doi:10.1002/9781119187202.ch5.

4. "Role of Caching in 5G," by **N. Naderializadeh**, M. Maddah-Ali, and **A. S. Avestimehr**, to appear in Information-Theoretic Perspectives on 5G Systems and Beyond (eds I. Maric, O. Simeone and S. Shamai), Cambridge University Press.

5. "Coding for Distributed Computation on the Edge: Enabling Robust and Resilient Edge Computing in a Service Oriented Network," by **S. Li** and **A. S. Avestimehr**, IEEE Communications Society Technology News Article (IEEE CTN), Issue: August 2018.

6. "Polyshard: Scalable Storage and Computation," by **A. S. Avestimehr**, S. Kannan, and P. Viswanath, in in Decentralized Payment Systems: Principles and Design (eds G. Fanti and P. Viswanath), The Distributed Technology Research Foundation.

Submitted and Under-Review Journal Publications

1. **Q. Yu**, M. A. Maddah-Ali and **A. S. Avestimehr**, "Straggler Mitigation in Distributed Matrix Multiplication: Fundamental Limits and Optimal Coding," submitted to *IEEE Transactions on Information Theory*, 2018.

2. **S. Prakash**, A. Reisizadehmobarakeh, R. Pedarsani, and **A.S. Avestimehr**, "Coded Computing for Distributed Graph Analytics," submitted to *IEEE Transactions on Information Theory*, 2018.

3. **C. Yang**, R. Pedarsani, and **A. S. Avestimehr**, "Communication-Aware Scheduling of Serial Tasks for Dispersed Computing," submitted to *IEEE Transactions on Networking*, 2018 .

Published and Accepted Journal Publications

1. A. Reisizadehmobarakeh, **S. Prakash**, R. Pedarsani, and **A.S. Avestimehr**, "Coded Computation over Heterogeneous Clusters," to appear in *IEEE Transactions on Information Theory*, 2019.

2. N. Azizan-Ruhi, F. Lahouti, **A. S. Avestimehr**, and B. Hassibi "Distributed Solution of Large-Scale Linear Systems via Accelerated Projection-Based Consensus," to appear in *IEEE Transactions on Signal Processing*, 2019 .

3. S.M. Asghari, Y.Ouyang, A. Nayyar, and **A. S. Avestimehr** "An Approximation Algorithm for Optimal Coded Multicast in Cache Networks," to appear in *IEEE Transactions on Communications.* .

4. **N. Naderializadeh**, M. A. Maddah-Ali and **A. S. Avestimehr**, "Cache-Aided Interference Management in Wireless Cellular Networks," to appear in *IEEE Transactions on Communications*, 2019.

5. **Q. Yu**, M. A. Maddah-Ali and **A. S. Avestimehr**, "Characterizing the Rate-Memory Tradeoff in Cache Networks within a Factor of 2," to appear in *IEEE Transactions on Information Theory*, 2018.

6. A. Anis, **A. El Gamal**, **A. S. Avestimehr** and Antonio Ortega, "A Sampling Theory Perspective of Graph-based Semi-supervised Learning," to appear in *IEEE Transactions on Information Theory.*

7. **S. Li**, M. A. Maddah-Ali, **Q. Yu** and **A. S. Avestimehr**, "A Fundamental Tradeoff Between Computation and Communication in Distributed Computing," in *IEEE Transactions on Information Theory*, vol. 64, no. 1, pp. 109-128, Jan. 2018 .

8. **Q. Yu**, M. A. Maddah-Ali and **A. S. Avestimehr**, "The Exact Rate-Memory Tradeoff for Caching with Uncoded Prefetching," to appear in *IEEE Transactions on Information Theory* (**conference version received the Jack K. Wolf Student Paper Award at ISIT 2017**).

9. **S. Li**, M. A. Maddah-Ali and **A. S. Avestimehr**, "Coding for Distributed Fog Computing," *IEEE Communications Magazine*, vol. 55, no. 4, pp. 34-40, April 2017 .

10. **S. Li**, M. A. Maddah-Ali and **A. S. Avestimehr**, "A Scalable Framework for Wireless Distributed Computing," in *ACM/IEEE Transactions on Networking*, vol. 25, no. 5, pp. 2643-2654, Oct. 2017 .

11. **M. Kiamari** and **A. S. Avestimehr**, "Capacity Region of the Symmetric Injective K-User Deterministic Interference Channel," to appear in *IEEE Transactions on Information Theory.*

12. **N. Naderializadeh**, M. Maddah-Ali, and **A. S. Avestimehr**, "Fundamental Limits of Cache-Aided Interference Management," in *IEEE Transactions on Information Theory*, vol. 63, no. 5, pp. 3092-3107, May 2017 .

13. **N. Naderializadeh**, **A. El Gamal**, and **A. S. Avestimehr**, "Fundamental Limits of Non-Coherent Interference Alignment via Matroid Theory," in *IEEE Transactions on Information Theory*, vol. 63, no. 10, pp. 6573-6586, Oct. 2017 .

14. **S. Lashgari** and **A. S. Avestimehr**, "Secrecy DoF of Blind MIMOME Wiretap Channel With Delayed CSIT," to appear in *IEEE Transactions on Information Forensics and Security* .

15. H. Yang, **N. Naderializadeh**, **A. S. Avestimehr** and J. Lee, "Topological Interference Management With Reconfigurable Antennas," in *IEEE Transactions on Communications*, vol. 65, no. 11, pp. 4926-4939, Nov. 2017 .

16. **A. Vahid**, V. Aggarwal, **A. S. Avestimehr**, and A. Sabharwal, "Interference Management with Mismatched Partial Channel State Information," in *EURASIP Journal on Wireless Communications and Networking*, 2017.

17. **A. Vahid**, M. A. Maddah-Ali, **A. S. Avestimehr** and Y. Zhu, "Binary Fading Interference Channel With No CSIT," in *IEEE Transactions on Information Theory*, vol. 63, no. 6, pp. 3565-3578, June 2017.

18. **D. Kao**, M. Maddah-Ali, and **A. S. Avestimehr**, "Blind Index Coding," in *IEEE Transactions on Information Theory*, vol. 63, no. 4, pp. 2076-2097, April 2017. (**conference version selected for semi-plenary presentation at ISIT 2015**).

19. **D. Kao** and **A.S. Avestimehr**, "Linear Degrees of freedom of MIMO Interference Channel with Delayed CSIT," in *IEEE Transactions on Information Theory*, vol. 63, no. 1, pp. 297-319, Jan. 2017.

20. **A. Vahid**, M. Maddah-Ali, and **A. S. Avestimehr**, "Approximate Capacity Region of the MISO Broadcast Channels with Delayed CSIT," *IEEE Transactions on Communications*, 2016.

21. **S. Lashgari**, R. Tandon, and **A. S. Avestimehr**, "MISO Broadcast Channel with Heterogeneous CSIT: Beyond Two Users," *IEEE Transactions on Information Theory*, 2016.

22. **S. Li**, **D. Kao**, and **A. S. Avestimehr**, "Rover-to-Orbiter Communication in Mars: Taking Advantage of the Varying Topology," *IEEE Transactions on Communications*, 2016.

23. **S. Fong**, **I. Issa**, and A.S. Avestimehr, "Two-Hop Interference Channels: Impact of Linear Schemes," *IEEE Transactions on Information Theory*, Vol 61, No 10, 2015.

24. C. Geng, **N. Naderializadeh**, **A. S. Avestimehr**, and S. Jafar, "On the Optimality of Treating Interference as Noise," *IEEE Transactions on Information Theory*, Vol 61, No 7, 2015.

25. H. Asnani, **I. Shomorony**, **A. S. Avestimehr**, and T. Weissman, "Network Compression: Worst Case Analysis," *IEEE Transactions on Information Theory*, Vol 61, No 7, 2015.

26. **N. Naderializadeh** and **A. S. Avestimehr**, "Degrees-of-Freedom of Interference Networks with No CSIT: Impact of Topology," *IEEE Transactions on Information Theory*, Vol 61, No 2, 2015.

27. A. Khajehnejad, W. Xu, **A. S. Avestimehr**, and B. Hassibi, "Improving the Thresholds of Sparse Recovery: an Analysis for Iterative Reweighted Basis Pursuit Algorithm," *IEEE Transactions on Information Theory*, Vol 61, No 9, 2015.

28. **A. S. Avestimehr**, T. Chen, **S. Lashgari**, **A. Nwana**, S. Rahman, S. Unal, and A. Wagner, "Video Delivery over Wireless Networks - Exploiting Network Heterogeneity and Content Commonality," *Intel Technical Journal*, Volume 19, Issue 1, 2015.

29. **A. Vahid**, M. Maddah-Ali, and **A. S. Avestimehr**, "Capacity Results for Binary Fading Interference Channels with Delayed CSIT," *IEEE Transactions on Information Theory*, Vol 60, No 10, October 2014.

30. R. Etkin, F. Parvaresh, **I. Shomorony**, and **A. S. Avestimehr**, "Computing Half-Duplex Schedules in Gaussian Relay Networks via Mincut Approximations," *IEEE Transactions on Information Theory*, Vol 60, No 11, November 2014.

31. **N. Naderializadeh** and A.S. Avestimehr, "ITLinQ: A New Approach for Spectrum Sharing in Device-to-Device Communication Systems," *IEEE Journal on Selected Areas in Communications Special Issue on 5G Wireless Communication Systems*, Vol 32, No 6, 2014.

32. **S. Lashgari**, A.S. Avestimehr, and C. Suh, "Linear Degrees of Freedom of the X-Channel with Delayed CSIT," *IEEE Transactions on Information Theory*, Vol 60, No 4, April 2014. Available online at: arXiv:1309.0799.

33. **I. Shomorony** and **A. S. Avestimehr**, "Degrees of Freedom of Two-Hop Wireless Networks: "Everyone Gets the Entire Cake"," *IEEE Transactions on Information Theory*, Vol 60, No 5, May 2014.

34. J. Abdoli and **A. S. Avestimehr**, "Layered Interference Networks with Delayed CSI: DoF Scaling with Distributed Transmitters," *IEEE Transactions on Information Theory*, Vol 60, No 3, March 2014.

35. **S. Lashgari** and **A. S. Avestimehr**, "Timely Throughput of Heterogeneous Wireless Networks: Fundamental Limits and Algorithms," *IEEE Transactions on Information Theory*, Vol 59, No 12, December 2013.

36. **I. Shomorony**, R. Etkin, F. Parvaresh, and **A. S. Avestimehr**, "Diamond Networks with Bursty Traffic: Bounds on the Minimum Energy-Per-Bit," *IEEE Transactions on Information Theory*, Vol 60, No 1, January 2014.

37. **I. Shomorony** and **A. S. Avestimehr**, "Worst-Case Additive Noise in Wireless Networks," *IEEE Transactions on Information Theory*, Vol 59, No 6, June 2013.

38. A. Chaaban, A. Sezgin, and **A. S. Avestimehr**, "Approximate Capacity of the Y Channel," *IEEE Transactions on Information Theory*, Vol 59, No 9, September 2013.

39. **I. Shomorony** and **A. S. Avestimehr**, "Two-Unicast Wireless Networks: Characterizing the Degrees-of-Freedom," *IEEE Transactions on Information Theory*, Vol 59, No 1, January 2013. (**conference version finalist of the Jack K. Wolf Student Paper Award at ISIT 2011**)

40. **A. Vahid**, C. Suh, and **A. S. Avestimehr**, "Interference Channels with Rate-Limited Feedback," *IEEE Transactions on Information Theory*, Vol 58, No 5, May 2012.

41. A. Sezgin, **A. S. Avestimehr**, M. Khajehnejad, and B. Hassibi, "Divide-and-conquer: Approaching the capacity of the two-pair bidirectional Gaussian relay network," *IEEE Transactions on Information Theory*, Vol 58, No 4, April 2012.

42. Y. Zhao, C. W. Tan, **A. S. Avestimehr**, S. N. Diggavi, and G. J. Pottie, "On the Maximum Achievable Sum-Rate With Successive Decoding in Interference Channels," *IEEE Transactions on Information Theory*, Vol 58, No 6, June 2012.

43. T. Liu, W. Xu, P. Spincemaille, **A. S. Avestimehr**, and Y. Wang, "Accuracy of the morphology enabled dipole inversion (MEDI) algorithm for quantitative susceptibility mapping in MRI," *IEEE Transactions on Medical Imaging*, Vol 31, No 3, 2012.

44. V. Aggarwal, **A. S. Avestimehr**, and A. Sabharwal, "On Achieving Local View Capacity Via Maximal Independent Graph Scheduling," *IEEE Transactions on Information Theory, Special Issue on Interference Networks*, Vol 57, No 5, May 2011.

45. **A. S. Avestimehr**, S. N. Diggavi, and D. N. C. Tse, "Wireless Network Information Flow: A Deterministic Approach," *IEEE Transactions on Information Theory,* Vol. 57, No. 4, pp. 1872-1905, April 2011. (**Communications Society and Information Theory Society Joint Paper Award.**)

46. Z. Shao, M. Chen, **A. S. Avestimehr**, and S. Li, "Cross-layer Optimization for Wireless Networks with Deterministic Channel", *IEEE Transactions on Information Theory*, Vol 57, No 9, September 2011.

47. A. Khajehnejad, W. Xu, S. Avestimehr, and B. Hassibi, "Analyzing Weighted ℓ_1 Minimization for Sparse Recovery with Nonuniform Sparse Models," *EEE Transactions on Signal Processing,* Vol. 59, No. 5, pp. 1985-2001, May 2011.

48. S. Kim, T. Ho, M. Effros, and **A. S. Avestimehr**, "Network error correction with unequal link capacities: upper bounds and capacities", *IEEE Transactions on Information Theory, Special Issue on Facets of Coding: from Algorithms to Networks,* Vol. 57, No. 2, pp. 1144-1164, February 2011.

49. **A. S. Avestimehr**, A. Sezgin, and D. N. C. Tse, "Capacity of the two-way relay channel within a constant gap," *European Transactions on Telecommunications*, Vol. 21, No. 4, pp. 363-374, June 2010.

50. **A. S. Avestimehr**, and D. N. C. Tse, "Outage Capacity of the Fading Relay Channel in the Low SNR Regime," *IEEE Transactions on Information Theory*, vol. 53, no. 4, pp. 1401–1415, April 2007.

Publications in Conference Proceedings (Peer Reviewed)[1]

1. **Q. Yu**, **S. Li**, N. Raviv, **M. Mousavi Kalan**, M. Soltanolkotabim and **A. S. Avestimehr**, "Lagrange Coded Computing: Optimal Design for Resiliency, Security and Privacy," to appear in Proc. AISTATS 2019.

2. **M. Yu**, Z. Lin, K. Narra, **S. Li**, Y. Li, N. S. Kim, A. Schwing, M. Annavaram, and **A. S. Avestimehr**, "GradiVeQ: Vector Quantization for Bandwidth-Efficient Gradient Aggregation in Distributed CNN Training," in *NIPS,* 2018.

3. Y. Li, **M. Yu**, **S. Li**, **A. S. Avestimehr**, N. S. Kim and A. Schwing, "Pipe-SGD: A Decentralized Pipelined SGD Framework for Distributed Deep Net Training," in *NIPS,* 2018.

4. **Q. Yu**, N. Raviv, and **A.S. Avestimehr**, "Coding for Private and Secure Computing," to appear in *Proceedings of ITW,* 2018 (invited paper).

5. **Q. Yu**, M. Maddah-Ali, and **A.S. Avestimehr**, "Straggler Mitigation in Distributed Matrix Multiplication: Fundamental Limits and Optimal Coding," in *Proceedings of ISIT,* 2018.

6. **S. Li**, M. Maddah-Ali, and **A. S. Avestimehr**, "Compressed Coded Distributed Computing," in *Proceedings of ISIT,* 2018.

7. **S. Prakash**, A. Reisizadehmobarakeh, R. Pedarsani, and **A.S. Avestimehr**, "Coded Computing for Distributed Graph Analytics," in *Proceedings of ISIT,* 2018.

8. **C. Yang**, R. Pedarsani, and **A.S. Avestimehr**, "Communication-Aware Scheduling of Serial Tasks for Dispersed Computing," in *Proceedings of ISIT,* 2018.

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[1]Some information about the main conference venues:

- Neural Information Processing Systems (NIPS): a flagship conference in machine learning; 8-page papers + supplementary appendices for proofs, etc; acceptance rate of ∼20%.

- IEEE International Symposium on Information Theory (ISIT): the flagship conference of Information Theory Society; 5 (or 6) page papers + supplementary appendices for proofs, etc (acceptance rate is not officially announced).

- IEEE International Conference on Communications (ICC): one of the two IEEE Communications Society's two flagship conferences; 7-page papers; acceptance rate of ∼35%-40%.

- IEEE Global Communications Conference (Globecom): the other IEEE Communications Society's flagship conference; 7-page papers; acceptance rate of ∼35%.

9. N. Azizan-Ruhi, F. Lahouti, **A. S. Avestimehr**, and B. Hassibi "Distributed Solution of Large-Scale Linear Systems via Accelerated Projection-Based Consensus," in *Proceedings of ICASSP*, 2018 .

10. **Q. Yu**, M. A. Maddah-Ali and **A. S. Avestimehr**, "Polynomial Codes: an Optimal Design for High-Dimensional Coded Matrix Multiplication," in *NIPS,* 2017.

11. **S. Li**, **S.M. Mousavi Kalan**, M. Soltanolkotabi, and **A. S. Avestimehr**, "Near-Optimal Straggler Mitigation for Distributed Gradient Methods," to appear in proceedings of *The 7th International Workshop on Parallel and Distributed Computing for Large Scale Machine Learning and Big Data Analytics*, 2018.

12. **M. Kiamari**, C. Wang, and **A. S. Avestimehr**, "On Heterogeneous Coded Distributed Computing," in *Proceedings of IEEE Globecom Conference,* 2017. (**Best Paper Award)**

13. S. M. Asghari, Y. Ouyang, A. Nayyar, and **A. S. Avestimehr**, "Optimal Coded Multicast in Cache Networks with Arbitrary Content Placement," in proceedings of *IEEE International Conference on Communications (ICC)*, 2018.

14. N. Azizan-Ruhi, F. Lahouti, **A. S. Avestimehr**, and B. Hassibi "Distributed Solution of Large-Scale Linear Systems via Accelerated Projection-Based Consensus," in proceedings of *IEEE ICASSP*, 2018.

15. **Q. Yu**, M. A. Maddah-Ali and **A. S. Avestimehr**, "Communication-optimal coding designs for caching networks," in *Proceedings of IEEE Information Theory Workshop (ITW),* 2017.

16. **Q. Yu**, M. A. Maddah-Ali and **A. S. Avestimehr**, "Coded Fourier Transform," in *Proceedings of IEEE Allerton Conference on Communication, Control, and Computing,* 2017.

17. **Q. Yu**, M. A. Maddah-Ali and **A. S. Avestimehr**, "Communication-Optimal Coding Designs for Caching Networks," in *Proceedings of IEEE Information Theory Workshop (ITW),* 2017.

18. **S. Li**, **S. Supittayapornpong**, M. A. Maddah-Ali and **A. S. Avestimehr**, "Coded Terasort," in *Proceedings of International Workshop on Parallel and Distributed Computing for Large Scale Machine Learning and Big Data Analytics*, 2017.

19. **S. Li**, M. A. Maddah-Ali and **A. S. Avestimehr**, "Architectures for Coded Mobile Edge Computing," in *Proceedings of IEEE/ACM Fog World Congress,* 2017.

20. **M. Kiamari**, C. Wang, and **A. S. Avestimehr**, "SINR-Threshold Scheduling with Binary Power Control for D2D Networks," in *Proceedings of IEEE Globecom Conference,* 2017.

21. **M. Kiamari**, C. Wang, and **A. S. Avestimehr**, "Coding for Edge-Facilitated Wireless Distributed Computing with Heterogeneous Users," in *Proceedings of Asilomar Conference,* 2017.

22. **S. Li**, M. Maddah-Ali, and **A. S. Avestimehr**, "Communication-Aware Computing for Edge Processing," in *Proceedings of ISIT,* 2017.

23. A. Reisizadehmobarakeh, **S. Prakash**, R. Pedarsani, and **A.S. Avestimehr**, "Coded Computation over Heterogeneous Clusters," in *Proceedings of ISIT,* 2017.

24. **Q. Yu**, M. Maddah-Ali, and **A.S. Avestimehr**, "The Exact Rate-Memory Tradeoff for Caching with Uncoded Prefetching," in *Proceedings of ISIT,* 2017. (**Jack K. Wolf Best Paper Award**)

25. **Q. Yu**, M. Maddah-Ali, and **A.S. Avestimehr**, "Characterizing the Rate-Memory Tradeoff in Cache Networks within a Factor of 2," in *Proceedings of ISIT,* 2017.

26. **N. Naderializadeh**, M. A. Maddah-Ali and **A. S. Avestimehr**, "On the Optimality of Separation between Caching and Delivery in General Cache Networks," in *Proceedings of ISIT,* 2017.

27. **M. Kiamari** and **A.S. Avestimehr**, "Capacity Region of the Symmetric K-User Deterministic Interference Channel," in *Proceedings of ISIT,* 2017.

28. **N. Naderializadeh**, M. A. Maddah-Ali and **A. S. Avestimehr**, "Cache-Aided Interference Management in Wireless Cellular Networks," in *Proceedings of ICC,* 2017.

29. **Q. Yu**, M. A. Maddah-Ali and **A. S. Avestimehr**, "How to Optimally Allocate Resources for Coded Distributed Computing?," in *Proceedings of ICC,* 2017.

30. **S. Li**, M. Maddah-Ali, and **A. S. Avestimehr**, "A Unified Coding Framework for Distributed Computing with Straggling Servers," in *Proceedings of IEEE NetCod,* 2016.

31. **S. Li**, **Q. Yu**, M. Maddah-Ali, and **A. S. Avestimehr**, "Edge-Facilitated Wireless Distributed Computing," in *Proceedings of IEEE Globecom,* 2016.

32. **S. Li**, M. Maddah-Ali, and **A. S. Avestimehr**, "Fundamental Tradeoff between Computation and Communication in Distributed Computing," in *Proceedings of ISIT,* 2016.

33. **N. Naderializadeh**, M. Maddah-Ali, and **A. S. Avestimehr**, "Fundamental Limits of Cache-Aided Interference Management," in *Proceedings of ISIT,* 2016.

34. **E. En Gad**, A. Gadde, **A. S. Avestimehr**, and A. Ortega, "Active Learning for Community Detection in Stochastic Block Models," in *Proceedings of ISIT,* 2016.

35. H. Yang, **N. Naderializadeh**, **A. S. Avestimehr**, and J. Lee, "Topological Interference Management with Reconfigurable Antennas," in *Proceedings of ISIT,* 2016.

36. **S. Li**, M. Maddah-Ali, and **A. S. Avestimehr**, "Coded MapReduce," in *Proceedings of Allerton,* 2015.

37. **E. En Gad**, A. Gadde, **A. S. Avestimehr**, and A. Ortega, "Active Learning on Weighted Graphs Using Adaptive and Non-Adaptive Approaches," in *Proceedings of ICASSP,* 2016.

38. **D. Kao**, M. Maddah-Ali, and **A. S. Avestimehr**, "Blind Index Coding," in *Proceedings of IEEE ISIT,* 2015. (**selected for semi-plenary presentation**).

39. **A. El Gamal**, **N. Naderializadeh**, and **A. S. Avestimehr**, "When Does an Ensemble of Matrices with Randomly Scaled Rows Lose Rank," in *Proceedings of IEEE ISIT,* 2015.

40. **S. Li**, **D. Kao**, and **A. S. Avestimehr**, "Rover-to-orbiter Communication in Mars: Taking Advantage of the Varying Topology," in *Proceedings of IEEE ISIT,* 2015.

41. **S. Lashgari**, R. Tandon, and **A. S. Avestimehr**, "A General Outer Bound for MISO Broadcast Channel with Heterogeneous CSIT," in *Proceedings of IEEE ISIT*, 2015.

42. A. Anis, **A. El Gamal**, **A. S. Avestimehr**, A. Ortega, "Asymptotic Justification of Band-Limited Interpolation of Graph Signals for Semi-Supervised Learning," in *Proceedings of IEEE ICASSP,* 2015.

43. **D. Kao, M**. Maddah-Ali, and **A. S. Avestimehr**, "Blind Index Coding over Wireless Channels: The Value of Repetition Coding," in *Proceedings of IEEE ICC,* 2015.

44. **N. Naderializadeh**, **A. El Gamal**, and **A. S. Avestimehr**, "Topological Interference Management with just Retransmission: What are the "Best" Topologies?," in *Proceedings of IEEE ICC,* 2015.

45. **S. Lashgari**, R. Tandon, and **A. S. Avestimehr**, "Three-User MISO Broadcast Channel: How Much Can CSIT Heterogeneity Help," in *Proceedings of IEEE ICC,* 2015.

46. **I. Shomorony** and **A.S. Avestimehr**, "Sampling Large Data on Graphs," in *Proceedings of IEEE GlobalSIP,* 2014.

47. **S. Lashgari** and **A. S. Avestimehr**, "Blind MIMO Wiretap Channel with Delayed CSIT," in *Proc. of Globecom 2014 Workshop - Trusted Communications with Physical Layer Security*, 2014.

48. **N. Naderializadeh**, **D. Kao** and **A. S. Avestimehr**, "How to Utilize Caching to Improve Spectral Efficiency in Device-To-Device Wireless Networks," in *Proc. of Allerton Conference*, 2014.

49. **S. Lashgari** and **A. S. Avestimehr**, "Transmitter Cooperation in Interference Channel with Delayed CSIT," in *Proc. of Allerton Conference*, 2014.

50. **I. Shomorony** and **A.S. Avestimehr**, "A Generalized Cut-Set Bound for Deterministic Multi-Flow Networks and its Applications," in *Proceedings of IEEE International Symposium on Information Theory (ISIT),* 2014.

51. **D. Kao** and **A. S. Avestimehr**, "Linear Degrees of Freedom of the MIMO X-Channel with Delayed CSIT," in *Proceedings of IEEE International Symposium on Information Theory (ISIT),* 2014.

52. **N. Naderializadeh** and **A. S. Avestimehr**, "ITLinQ: A New Approach for Spectrum Sharing in Device-to-Device Communication Systems," in *Proceedings of IEEE International Symposium on Information Theory (ISIT),* 2014.

53. **A. Vahid**, M. Maddah-Ali, and **A. S. Avestimehr**, "Binary Fading Interference Channel with No CSIT," in *Proceedings of IEEE International Symposium on Information Theory (ISIT),* 2014.

54. **D. Kao**, M. Maddah-Ali, and **A. S. Avestimehr**, "Align-and-Forward Relaying for Two-hop Erasure Broadcast Channels," in *Proceedings of IEEE International Symposium on Information Theory (ISIT),* 2014.

55. **S. Lashgari** and **A. S. Avestimehr**, "Blind Wiretap Channel with Delayed CSIT," in *Proceedings of IEEE International Symposium on Information Theory (ISIT)*, 2014.

56. **N. Naderializadeh** and **A.S. Avestimehr,** "ITLinQ: A New Approach for Spectrum Sharing in Device-to-Device Communication Systems," in *Proc. of IEEE DySPAN*, 2014.

57. **A. Vahid**, M. Maddah-Ali, and **A. S. Avestimehr**, " Communication Through Collisions: Opportunistic Utilization of Past Receptions", in *Proc. of INFOCOM*, 2014.

58. **S. Lashgari**, **A.S. Avestimehr**, and C. Suh, "Linear Degrees of Freedom of the X-Channel with Delayed CSIT", in *Proc. of Allerton Conference*, UIUC, October 2013.

59. **A. Vahid**, M. Maddah-Ali, and **A. S. Avestimehr**, "Approximate Capacity of the Two-User MISO Broadcast Channel with Delayed CSIT", in *Proc. of Allerton Conference*, UIUC, October 2013.

60. C. Geng, **N. Naderializadeh**, **A. S. Avestimehr**, and S. Jafar, "On the Optimality of Treating Interference as Noise", in *Proc. of Allerton Conference*, UIUC, October 2013.

61. H. Asnani, **I. Shomorony**, **A. S. Avestimehr**, and T. Weissman, "Operational Extremality of Gaussianity in Network Compression," in *Proc. of Information Theory Workshop (ITW)*, September 2013.

62. **A. Nwana**, **A. S. Avestimehr**, and T. Chen "A Latent Social Approach to YouTube Popularity Prediction," in *Proc. of Globeocom*, December 2013.

63. **I. Issa**, **S. Fong**, and **A.S. Avestimehr**, "Two-Hop Interference Channels: Impact of Linear Time-Varying Schemes," in *Proceedings of IEEE International Symposium on Information Theory (ISIT)*, 2013.

64. **N. Naderializadeh** and **A.S. Avestimehr**, "Impact of Topology on Interference Networks with No CSIT," in *Proceedings of IEEE International Symposium on Information Theory (ISIT)*, 2013.

65. H. Asnani, **I. Shomorony**, **A. S. Avestimehr**, and T. Weissman, "Network Compression: Worst-Case Analysis," in *Proceedings of IEEE International Symposium on Information Theory (ISIT)*, 2013.

66. R. Etkin, F. Parvaresh, **I. Shomorony**, and **A. S. Avestimehr**, "On Efficient Min-Cut Approximations in Half-Duplex Relay Networks," in *Proceedings of IEEE International Symposium on Information Theory (ISIT)*, 2013.

67. **I. Shomorony** and **A. S. Avestimehr**, "Degrees of Freedom of Two-Hop Wireless Networks: "Everyone Gets the Entire Cake"", *Proc. of Allerton Conference*, UIUC, September 2012.

68. **I. Shomorony** and **A. S. Avestimehr**, "On the Role of Deterministic Models in $K \times K \times K$ Wireless Networks," *Proceedings of IEEE Information Theory Workshop (ITW)*, 2012.

69. **I. Shomorony**, **A. S. Avestimehr**, H. Asnani, and T. Weissman, "Worst-Case Source for Distributed Compression with Quadratic Distortion," *Proceedings of IEEE Information Theory Workshop (ITW)*, 2012.

70. **I. Shomorony** and **A. S. Avestimehr**, "Is Gaussian Noise the Worst-Case Additive Noise in Wireless Networks?," *Proceedings of IEEE International Symposium on Information Theory (ISIT),* 2012.

71. **A. Vahid**, M. Maddah-Ali, and **A. S. Avestimehr**, "Binary Fading Interference Channel with Delayed Feedback," *Proceedings of IEEE International Symposium on Information Theory (ISIT),* 2012.

72. **I. Shomorony**, R. Etkin, F. Parvaresh, and **A. S. Avestimehr**, "Bounds on the Minimum Energy-Per-Bit for Bursty Traffic in Diamond Networks," *Proceedings of IEEE International Symposium on Information Theory (ISIT),* 2012.

73. **S. Lashgari** and **A. S. Avestimehr**e, "Approximating the Timely Throughput of Heterogeneous Wireless Networks," *Proceedings of IEEE International Symposium on Information Theory (ISIT),* 2012.

74. **A. Vahid**, M. Maddah-Ali, and **A. S. Avestimehr**, "Interference Channel with Binary Fading: Effect of Delayed Network State Information", *Proc. of Allerton Conference*, UIUC, September 2011.

75. K. Sutuntivorakoon, A. Aggarwal, **A. S. Avestimehr**, and A. Sabharwal, "Maximal Clique Scheduling for Interference Networks with Local View", *Proc. of Allerton Conference*, UIUC, September 2011.

76. **I. Shomorony** and **A. S. Avestimehr**, "Sum Degrees-of-Freedom of Two-Unicast Wireless Networks," *Proceedings of IEEE International Symposium on Information Theory (ISIT),* 2011. (**finalist of the Jack K. Wolf Student Paper Award**)

77. Y. Zhao, C. W. Tan, **A. S. Avestimehr**, S. N. Diggavi, and G. J. Pottie, "On the Sum-Capacity with Successive Decoding in Interference Channels," *Proceedings of IEEE International Symposium on Information Theory (ISIT),* 2011.

78. A. Chaaban, A. Sezgin, and **A.S. Avestimehr**, "On the Sum-Capacity of the Y-Channel," *Proceedings of IEEE Asilomar SSC,* 2011.

79. **A. Vahid**, V. Aggarwal, **A. S. Avestimehr**, and A. Subharwal, "On the Capacity of Multi-Hop Wireless Networks with Partial Network Knowledge", *Proc. of Allerton Conference*, UIUC, September 2010.

80. A. Sezgin, H. Boche, and **A. S. Avestimehr**, "Bidirectional Multi-Pair Network with a MIMO Relay: Beamforming Strategies and Lack of Duality", *Proc. of Allerton Conference*, UIUC, September 2010.

81. V. Aggarwal, **A. S. Avestimehr**, and A. Subharwal, "Normalized Sum-Capacity of Interference Networks with Partial Information," in Proceedings of *IEEE International Symposium on Information Theory (ISIT)*, 2010.

82. **A. Vahid** and **A. S. Avestimehr**, "The Two-User Deterministic Interference Channel with Rate-Limited Feedback," in Proceedings of *IEEE International Symposium on Information Theory (ISIT)*, 2010.

83. A. Khajehnejad, W. Xu, **S. Avestimehr**, and B. Hassibi, "Improved Sparse Recovery Thresholds with Two-Step Reweighted ℓ_1 Minimization," in Proceedings of *IEEE International Symposium on Information Theory (ISIT)*, 2010.

84. Z. Shao, M. Chen, **S. Avestimehr**, and S. Li, "Cross-layer Optimization for Wireless Networks with Deterministic Channel", *Proc. of INFOCOM*, 2010.

85. V. Aggarwal, **A. S. Avestimehr**, and A. Subharwal, "Distributed Universally Optimal Strategies for Interference Channel with Partial Message Passing", *Proc. of Allerton Conference*, UIUC, September 2009.

86. S. Kim, T. Ho, M. Effros, and **A. S. Avestimehr**, "Network error correction with unequal link capacities", *Proc. of Allerton Conference*, UIUC, September 2009.

87. A. Cohen, M. Effros, **A. S. Avestimehr**, and R. Koetter, "Linearly Representable Entropy Vectors and their Relation to Network Coding Solutions," in Proceedings of *IEEE Information Theory Workshop*, 2009.

88. A. Cohen, **A. S. Avestimehr** and M. Effors, "On Networks with Side Information," in Proceedings of *IEEE International Symposium on Information Theory (ISIT)*, 2009.

89. A. Sezgin, M. Khajehnejad, **A. S. Avestimehr**, and B. Hassibi, "Approximate capacity region of the two-pair bidirectional Gaussian relay network," in Proceedings of *IEEE International Symposium on Information Theory (ISIT)*, 2009.

90. **S. Avestimehr**, M. Khajehnejad, A. Sezgin, and B. Hassibi, " Capacity region of the deterministic multi-pair bi-directional relay network," in Proceedings of *IEEE Information Theory Workshop*, 2009.

91. M. Khajehnejad, W. Xu, **A. S. Avestimehr** and B. Hassibi, "Weighted ℓ_1 Minimization for Sparse Recovery with Prior Information," in Proceedings of *IEEE International Symposium on Information Theory (ISIT)*, 2009.

92. **A. S. Avestimehr** and T. Ho, "Approximate capacity of the symmetric half-duplex Gaussian buttery network," in Proceedings of *IEEE Information Theory Workshop*, June 2009.

93. **A. S. Avestimehr**, "Cooperative relaying with side information," in Proceedings of *CAMSAP*, 2009.

94. **A. S. Avestimehr**, A. Sezgin and D N C. Tse, "Approximate capacity of the two-way relay channel: a deterministic approach", in Proceedings of *Allerton Conference*, UIUC, September 2008.

95. S. Pawar, **A. S. Avestimehr** and D N C. Tse, "Diversity multiplexing tradeoff of the half-duplex relay channel", Invited paper, in Proceedings of *Allerton Conference*, UIUC, September 2008.

96. **A. S. Avestimehr**, S N. Diggavi and D N C. Tse, "Approximate capacity of Gaussian relay networks", in Proceedings of *IEEE International Symposium on Information Theory (ISIT)*, 2008.

97. **A. S. Avestimehr**, S N. Diggavi and D N C. Tse, "Information flow over compound wireless relay networks", in Proceedings of *IEEE international Zurich seminar (IZS)*, 2008.

98. **A. S. Avestimehr**, S N. Diggavi and D N C. Tse, "Approximate characterization of capacity in Gaussian relay networks", in Proceedings of *IEEE International Wireless Communications and Mobile Computing Conference (IWCMC)*, Crete, August 2008.

99. **A. S. Avestimehr**, S N. Diggavi and D N C. Tse, "Wireless Network Information Flow", in Proceedings of *Allerton Conference*, UIUC, September 2007.

100. **A. S. Avestimehr**, S N. Diggavi and D N C. Tse, "A Deterministic Approach to Wireless Relay Networks", in Proceedings of *Allerton Conference*, UIUC, September 2007.

101. **A. S. Avestimehr**, S N. Diggavi and D N C. Tse, "A deterministic model for wireless relay networks and its capacity", in Proceedings of *IEEE Information Theory Workshop (ITW)*, Bergen, July 2007.

102. **A. S. Avestimehr** and D N C. Tse, "Outage-Optimal Relaying in the Low SNR Regime", in Proceedings of *IEEE International Symposium on Information Theory (ISIT)*, Adelaide, Australia, Sept 2005.

103. A. Sahai, **A. S. Avestimehr** and P. Minero, "Anytime communication over the Gilbert-Eliot channel with noiseless feedback", in Proceedings of *IEEE International Symposium on Information Theory (ISIT)*, Adelaide, Australia, Sept 2005.

104. **S. Avestimehr**, K. Nayebi, and S. Kasaei, "Multirate Structures for Arbitrary Rate Error Control Coding", in Proceedings of *International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, 2003.

Patents

1. **A.S. Avestimehr** and **N. Naderializadeh**, "Spectrum sharing in device-to-device communication systems", US20160295419A1, Filed 11/2014, Published 10/2016.

2. W. Shin, **I. Shomorony**, **A.S. Avestimehr**, C. Shin, J. Lim, W. Noh, "Source, relay, and destination executing cooperation transmission and method for controlling each thereof", US20140112340A1, Filed 10/2013, Published 4/2014.

3. W. Shin, **I. Issa**, **S. Fong**, **A.S. Avestimehr**, W. Noh, J. Lim, and K. Jang, "Method and apparatus to control interference in multi-hop network and relay node and node pair using the method", US9698928B2, Filed 3/2014, Published 7/2017.

4. W. Shin, **I. Issa**, **S. Fong**, **A.S. Avestimehr**, W. Noh, J. Lim, and K. Jang, "Method and apparatus to control interference in multi-hop network and relay node and node pair using the method", EP2779479A1, Filed 3/2014, Published 9/2014.

Research Funding

1. Coded Computing: A Joint Computing and Communication Design Framework for Tactical Wireless Edge (pending), ONR, $300,000 (sole-PI).

2. DARPA: Coded Dispersed Computing Expansion (10/1/2018-03/31/2021), DARPA, $1,196,559 (PI, my portion $506,615) (supplementary to APaC project, co-PIs: Murali Annavaram (USC) and Bhaskar Krishnamachari (USC)).

3. NSF: CIF: Coded Computing for Large-Scale Machine Learning (07/01/2018-06/30/2022), NSF, $1,200,000 (co-PI, my portion $300,000, co-PIs: Alex Dimakis (UT Austin, PI), Pulkit Grover (CMU), Viveck Cadambe (Penn State)) .

4. ARO: Coded Computing: A Transformative Framework for Tactical Wireless Edge Computing (07/1/2018-06/30/2021), ARO, $375,000 (sole PI) .

5. DARPA: APaC: Adaptive Pricing and Coding for Dispersed Computing (03/31/2017-02/38/2021), DARPA, $8,317,754 (PI, my portion $1,418,980, co-PIs: Murali Annavaram (USC), Bhaskar Krishnamachari (USC). $4.1M is subaward to USC-ISI with Steve Schwab (USC-ISI) as PI) .

6. NSF: CCF: Foundations of Coding for Modern Distributed Computing (05/01/2017-04/31/2021), NSF, $1,050,000 (co-PI, my portion $350,000, co-PIs: Kannan Ramchandran (UC Berkeley, PI) and Michael Mahoney (UC Berkeley)) .

7. An Information Theoretic Framework to Device-to-Device Communication Networks (02/01/2016-01/31/2019), DOD (NAVY-ONR), $300,000 (sole PI).

8. Wireless Edge Computing (09/28/2016-03/31/2018), National Security Agency (NSA), $235,125 (sole PI).

9. DENO: Distributed Encoded Optimization for Cybersecurity Data Analytics (08/30/2017-08/30/2018), Northrop Grumman, $100,000 (PI, my portion $74,754, Co-PI: Mahdi Soltanolkotabi (USC)).

10. NSF: NeTS: Medium: Collaborative Research: Information Architectures for Femto-aided Cellular Networks (09/01/2012-08/31/2018), NSF, $1,128,000 (co-PI, my portion $376,000, co-PIs: Sanjoy Shakkottai (UT Austin, PI) and Ashutosh Sabharwal (Rice)).

11. Wireless Edge Computing (01/01/2016), Unrestricted Gift from Intel, $125,000 (sole PI).

12. NSF: EARS: Interference-Aware RF Theory and Design (01/01/2013-01/01/2017), NSF, $458,187 (PI, my portion $347,789, co-PI: Al Molnar (Cornell)).

13. Okawa Foundation Research Award (1/1/2016), Unrestricted Gift, $10,000 (sole PI).

14. Dynamics of Wireless Network Information Flow (01/01/2013-01/01/2016), DOD (NAVY-ONR), $300,000 (sole PI).

15. NSF: CAREER: Breaking the Barriers in Wireless Network Information Theory: A Deterministic Approach (02/01/2010-01/31/2017), NSF, $441,876 (sole PI).

16. NSF: CCF: Medium: Collaborative Research: Multihop Multiflow Wireless Networks: A Treasure Hunt (07/01/2012-06/30/2016), NSF, $750,000 (co-PI, my portion $187,500, co-PIs: Giuseppe Caire (USC, PI), Syed Jafar (UC Irvine), and Mahesh Varanasy (UC Colorado)) .

17. Mars Relay Network (01/01/2014-6/01/2016), JPL, $90,000 (sole PI)

18. RV 1: Multi-Network Delivery (01/01/2014-8/16/2015), Verizon, $102,952 (sole PI).

19. Spectrum Sharing for Device-to-device communication in 5G networks (01/01/2014), Unrestricted Gift from Intel, $50,000 (sole PI).

20. CISCO: VAWN (01/01/2014), Unrestricted Gift from Cisco, $60,000 (sole PI).

21. Interference Management with Local Network Views (01/01/2014), Unrestricted Gift from Qualcomm, $55,000 (sole PI).

22. Video Aware Wireless Networks (01/01/2011-12/31/2013), Verizon, Intel, and Cisco, $700,000 (PI, my portion: $350,000 (approximately), co-PIs: Aaron Wagner (Cornell), Tsuhan Chen (Cornell), and Sheila Hemami (Cornell)).

23. Qualcomm Innovation Award (08/01/2013-08/01/2014), Qualcomm, $100,000.

24. Information Flow over Networks with Large Dynamic Range of Variation: Impacts of Local Network-State Information (05/15/2011-05/14/2014), DOD (AFOSR-YIP), $360,000 (sole PI).

25. Robustness and Security of Wireless Networks (08/01/2010-12/31/2013), NSF TRUST Center, $170,000 (sole PI).

26. Degrees-of-freedom of Multi-hop Wireless Networks (04/01/2012 - 3/31/2013), Samsung Electronics, $90,000 (sole PI).

Invited Seminars and Presentations

1. ICASSP 2019, Special Session on Robust distributed computing.

2. LIDS Seminar Series, MIT EE Department, "Coded Computing", Fall 2018.

3. Frontiers of Coding Theory and Practice, Information Theory Workshop (ITW), "Coded Computing", November 2018.

4. Infocom'18 workshop on network slicing: "Communication-Aware Scheduling for Dispersed Computing", April 2018.

5. ISL Seminar, Stanford EE Department: "Coded Computing", March 2018.

6. Information Theory and Applications (ITA) Workshop, UCSD: "Polynomial Codes for High-Dimensional Distributed Matrix Multiplication", February 2018.

7. Information Theory Workshop (ITW), Kaohsiung, Taiwan, "Communication-Optimal Coding Designs for Caching Networks", November 2017.

8. Allerton Conference on Communication, Control, and Computing, "Polynomial Codes for High-Dimensional Distributed Matrix Multiplication," October 2017.

9. Communication Theory Workshop "Coded Distributed Computing", May 2017.

10. Information Theory and Applications (ITA) Workshop, UCSD: "Coded Terasort", February 2017.

11. Allerton Conference on Communication, Control, and Computing, "Coded Terasort," October 2016.

12. Asilomar Conference on Signals, Systems, and Computers, "Coded Distributed Computing: Fundamental Limits and Practical Challenges", November 2016.

13. Institute Henri Poincar (IHP), "Coded Computing", February 2016.

14. Semi-Plenary Presentation at IEEE Int. Symp. Inf. Theory (ISIT), "Blind Index Coding", July 2015.

15. Allerton Conference on Communication, Control, and Computing, "Coded MapReduce," October 2015.

16. Caltech EE Seminar, "Coded MapReduce," October 2015.

17. Information Theory and Applications (ITA) Workshop, UCSD: "Label Complexity of Graph-Based Semi-Supervised Learning", February 2015.

18. Allerton Conference on Communication, Control, and Computing, "How to Utilize Caching to Improve Spectral Efficiency in Device-To-Device Wireless Networks," October 2014.

19. Illumina, "Sampling Large Data on Graphs", 2014.

20. Raytheon Fellows Seminar Series, and Aerospace Corporation, "Spectrum Sharing and Secrecy in Communication Systems", 2014.

21. Information Theory and Applications (ITA) Workshop, UCSD: "ITLinQ: A New Approach for Spectrum Sharing in Device-to-Device Communication Systems", February 2014.

22. Qualcomm, "ITLinQ: A New Approach for Spectrum Sharing in Device-to-Device Communication Systems", January 2014.

23. Department Seminar, UCSD: "ITLinQ: A New Approach for Spectrum Sharing in Device-to-Device Communication Systems", January 2014.

24. Allerton Conference on Communication, Control, and Computing: "Linear Degrees of Freedom of the X-Channel with Delayed CSIT", October 2013.

25. Communication Theory Workshop (CTW): "Information Flow over Interference Networks: Impacts of Topology and CSI", June 2013.

26. Information Theory and Applications (ITA) Workshop, UCSD: "Worst-case Noise in Wireless Networks", February 2013.

27. Allerton Conference on Communication, Control, and Computing: "Degrees of Freedom of Two-Hop Wireless Networks: "Everyone Gets the Entire Cake"", October 2012.

28. Information Theory Workshop (ITW): "On the Role of Deterministic Models in $K \times K \times K$ Wireless Networks", September 2012.

29. Information Theory Workshop (ITW): "Worst-Case Source for Distributed Compression with Quadratic Distortion", September 2012.

30. Network Science Workshop, CUHK: "Frontiers of Multihop Multiflow Wireless Networks", August 2012.

31. One of a Series Seminar, LIDS, MIT: "Network Capacity with Local Network Views", March 2012.

32. Information Theory and Applications (ITA) Workshop, UCSD: "Network Capacity with Local Network Views", February 2012.

33. Alcatel-Lucent, Wireless Communications Group: "Interference Management with Local Network Views", December 2011.

34. Alcatel-Lucent, Bell Labs: "Network Capacity with Local Network Views", December 2011.

35. WNCG Seminars, UT Austin: "Wireless Network Coding with Local Network Views", November 2011.

36. Communications Seminar, University of Illinois Urbana-Champaign (UIUC): "Fundamentals of Communication with Local Network Views", October 2011.

37. Allerton Conference on Communication, Control, and Computing: "Interference Channel with Binary Fading: Effect of Delayed Network State Information", September 2011.

38. Allerton Conference on Communication, Control, and Computing: "On the Capacity of Multi-Hop Wireless Networks with Partial Network Knowledge", September 2010.

39. Networking Seminar Series at ECE department of University of Toronto: "Breaking the barriers in wireless network information theory", April 2010.

40. ECE Department Seminar at Rice University: "Breaking the barriers in wireless network information theory", March 2010.

41. EECS Department Seminar at Syracuse University: "Breaking the barriers in wireless network information theory", March 2010.

42. Engineering in Medicine and Biology Society (EMBS) HealthTech Symposium: "Breaking the barriers in wireless network information theory", 2010.

43. Information Theory and its Applications (ITA) workshop: On cross-layer optimization for wireless networks, February 2010.

44. Qualcomm Inc.: "Wireless network information flow: a deterministic approach", 2009.

45. Department of Electrical and Engineering at Caltech: "Wireless network information flow: a deterministic approach", 2008.

46. Department of Electrical and Computer Engineering at UIUC: "Wireless network information flow: a deterministic approach", 2008.

47. Department of Electrical and Engineering at USC: "Wireless network information flow: a deterministic approach", 2008.

48. Department of Electrical and Systems Engineering at the UPenn: "Wireless network information flow: a deterministic approach", 2008.

Selected Services at the University of Southern California (USC)

- At-Large Faculty Member Representative on Viterbi School's Appointment, Promotions, and Tenure (APT) Committee, 2015-2016 and 2017-2019.

- Chair of the Joint APT/EFC Merit Review Subcommittee at Viterbi School, 2018.

- Co-Director of the MS in Electrical Engineering – Wireless Health Technology (MSEE-WHT), 2014 - now.

- Co-Director of the Communication Sciences Institute, 2017 - now.

- Member of the EE Executive Committee, 2017 - now.

- EE Faculty Merit Review Committee Member, 2016-2017 and 2017-2018.

- Member of the EE PhD Fellowship Admissions Committee, 2014 - now.

- EE Faculty Recruiting Committee, 2015-2018.

- Ming Hsieh Institute (MHI) Advisory Board Member, 2016 - now.

- EE Graduate Curriculum Committee, 2016-now.

- EE Research Festival Judge, 2017.

- EE Department Study Group to Understand and Adopt Recent Trends, 2016.

- EE Space Committee Member, 2015.

- Various ad-hoc committees for tenure and 3-year appointment evaluations.

- Various PhD Defense, PhD Qualifying, and PhD Screening Committees at EE Department.

Selected Professional Services

- Associate Editor for the IEEE Transactions on Information Theory, 2014-2017.

- General co-chair of 2020 IEEE International Symposium on Information Theory (ISIT).

- General co-Chair of the 2012 North American School of Information Theory.

- General co-Chair of the 2010 Workshop on Interference Networks (WINE).

- Finance Chair of 2017 Communication Theory Workshop (CTW).

- Technical Program Committee (TPC) member of IEEE International Symposium on Information Theory (ISIT), 2009-now.

- Technical Program Committee (TPC) member of various conferences at information theory and communication theory societies, including Information Theory Workshop (ITW), International Conference on Communications (ICC), Globecom, etc.

- Organizer of an invited session at 2017 Communication Theory Workshop (CTW).

- Organizer of an invited session at 2016 and 2015 Asilomar Conference on Signals, Systems, and Computers.

- Panelist on "Tenure and Promotions" at IEEE International Symposium on Information Theory (ISIT).

- Panelist on "Funding" at IEEE International Symposium on Information Theory (ISIT).

- Serving on various proposal reviewing panels at NSF, including CAREER, CCF, ECCS, and PCON panels.

- Serving on various AFOSR proposal reviewing committees, including complex networks program and YIP awards.

- Serving as reviewer of various journals and conferences in information theory, communication theory, signal processing, machine learning, and CS theory communities, including *IEEE Transactions on Information Theory*, *IEEE Transactions on Communications*, *IEEE Communications Magazine*, *IEEE Transactions on Wireless Communications*, *IEEE transactions on Signal Processing*, *ACM Transactions on Sensor Networks (TOSN)*, *Math Programming*, *IEEE International Symposium on Information Theory (ISIT)*, and *ACM-SIAM Symposium on Discrete Algorithms (SODA)*.