Arash Golami Davoodi

Contact Information

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Interests

- Mathematics
- Algorithms
- Information Theory
- Graph Theory
- Statistics and Probability Theory
- Machine Learning
- Convex Optimization
- Game Theory

Employment

Research Fellow, School of Computer Science, Carnegie Mellon University, September 2018 - Present

- High dimensional classification
- Finding associations in large datasets

Education

PhD in Communication Theory and Systems, Department of Electrical Engineering and Computer Science, University of California Irvine, Fall 2013 to Summer 2018 (GPA: 4.00/4.00)

- Finding asymptotic bounds on the entropies
- Capacity region Characterization

M.Sc. in Communication Systems, Sharif University of Technology, Tehran, Iran.

- Convex Optimization (power allocation) problems
- Numerical methods for PDEs

B.Sc. in Electrical Engineering (Minor in Mathematics), Sharif University of Technology, Tehran, Iran.

Honors and Awards

- 2018 IEEE Communications Society and Information Theory Society Joint **Best Paper Award,** Paris, France.
- 2014 IEEE GLOBECOM **Best Paper Award,** Austin, Texas, USA.
- **Lane Fellowship**, School of Computer Science, Carnegie Mellon University
- **Bronze Medal** in the National Mathematics Olympiad, 2003.
- **Iran National Elite Foundation Fellowship** from 2005 to 2013.
- Ranked $\mathbf{8}^{th}$ **(top 0.002%)** among nearly 400,000 participants in the Iranian nationwide university entrance exam (BS), 2005.
- Ranked $\mathbf{2}^{th}$ **(top 0.007%)** in *Communication Systems*, $\mathbf{2}^{th}$ **(top 0.007%)** in *Electronics*, $\mathbf{2}^{th}$ **(top 0.007%)** in *Control*, among nearly 30,000 participants in the National University Entrance Exam (MS), 2009, Iran.
- Ranked $\mathbf{2}^{th}$ **(top 0.01%)** among nearly 20,000 participants in the National University Entrance Exam (PhD), 2012, Iran.
- Ranked $\mathbf{7}^{th}$ (top 0.02%) in *Final of* 14^{th} *National Student Olympiad of Electrical Engineering*, 2009, Iran
- Ranked $\mathbf{1}^{st}$ **in the Ph.D. Preliminary Exam** EECS, UCI 2013.
- University of California Fellowship for graduate studies 2013.
- Henry Samueli Fellowship Summer 2014.

Published Journal Papers

- **A. G. Davoodi**, S. Chang, H. Yoo, A. Baweja, M. Mongia, H. Mohimani, "ForestDSH: A Universal Hash Design for Discrete Probability Distributions", Data Mining and Knowledge Discovery, 2020.
- **A. G. Davoodi**, S. A. Jafar, "Sum-set Inequalities from Aligned Image Sets: Instruments for Robust GDoF Bounds," IEEE Transactions on IT 2020.
- **A. G. Davoodi**, S. A. Jafar, "Aligned Image Sets and the GDoF of Symmetric MIMO Interference Channel with Partial CSIT," IEEE Transactions on IT 2020.
- **A. G. Davoodi**, S. A. Jafar, "DoF Region of the MIMO (M, N_1, N_2) Broadcast Channel with Partial CSIT," IEEE Transactions on IT, 2020.
- **A. G. Davoodi**, S. A. Jafar, "Optimality of Simple Layered Superposition Coding in the 3 User MISO BC with Finite Precision CSIT," IEEE Transactions IT, 2020.
- **A. G. Davoodi**, S. A. Jafar, "K-User Symmetric $M \times N$ MIMO Interference Channel with Finite Precision CSIT: A GDoF Perspective," IEEE Transactions IT, 2019.
- **A. G. Davoodi**, S. A. Jafar, "GDoF of the MISO BC: Bridging the gap between finite precision CSIT and perfect CSIT," IEEE Transactions on IT, 2019.
- **A. G. Davoodi**, S. A. Jafar, "Aligned image sets under channel uncertainty: Settling conjectures on the collapse of degrees of freedom under finite precision CSIT," 2018 IEEE Communications Society and IT Society Joint **Best Paper Award,** Paris, France.
- **A. G. Davoodi**, S. A. Jafar, "Network Coherence Time Matters: Interference Networks with Finite Precision CSIT Perfect CSIR" IEEE Transactions on IT, 2018.
- **A. G. Davoodi**, S. A. Jafar, "Generalized DoF of the symmetric K-user interference channel under finite precision CSIT," IEEE Transactions on IT, 2017.
- **A. G. Davoodi**, S. A. Jafar, "Transmitter cooperation under finite precision CSIT: A GDoF perspective," IEEE Transactions on IT, 2016.
- **A. G. Davoodi**, M. J. Emadi, and M. R. Aref, "Analytical power allocation for a full duplex decode-and-forward relay channel," Communication and IT, 2013.
- A G. Davodi, D.D. Ganji, **A G. Davoodi**, A. Asgari, "Finding general and explicit solutions (2 +1) dimensional Broer-Kaup-Kupershmidt system nonlinear equation by Exp-Function method," Applied Mathematics and Computation, 2010.
- G. Domairry, A. G. Davodi, **A. G. Davoodi**, "Solutions for the Double Sine-Gordon equations by Exp-function method, Tanh and Extended Tanh methods," Numerical Method For Partial Differential Equation, 2010.

For details about my conference publications, please see my Google Scholar profile.

Featured Conference papers

- **A. G. Davoodi**, S. A. Jafar, "Settling conjectures on the collapse of degrees of freedom under finite precision CSIT," 2014 IEEE Globecom **Best Paper Award,** Austin, Texas.
- M. Ferdowsi, **A. G. Davoodi**, and H. Mohimani, "Measuring Mutual Information Between All Pairs of Variables in Subquadratic Complexity," AISTATS, Palermo, Sicily, Italy, 2020.
- M. Mongia , B. Soudry and **A. G. Davoodi**, and H. Mohimani, "Efficient Database Search via Tensor Distribution Sensitive Bucketing", PAKDD, Singapore, 2020.

Advising

- **PhD Students:** Mihir Mongia, Mohsen Ferdowsi
- **Master Students:** Chengze Shen
- **Undergraduate Students:** Anubhav Bajewa, Benjamin Sourdi, Sean Chang

Reviewing activities

- IEEE Transactions on Information Theory
- IEEE Transactions on Communication Systems
- IEEE ISIT, GLOBECOM, ICC, and IWCIT