Mohsen Heidari Khoozani

CONTACT INFORMATION

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ACADEMIC APPOINTMENTS

- **Postdoctoral Research Fellow**, Aug. 2019- Present
  NSF Center for Science of Information (CSoI),
  Purdue University
- **Postdoctoral Research Fellow**, Jan. 2019- Aug. 2019
  University of Michigan
- **Visiting Scholar**, University of Cambridge, the U.K. Aug. 2018

EDUCATION

- **Ph.D.**, **Electrical Engineering**, University of Michigan 2013 - 2018
  Thesis: "Capacity, Error Exponent, and Structural Results for Communication Networks"
  Adviser: Sandeep Pradhan
- **M.Sc.**, **Mathematics**, University of Michigan
  Major: Applied Mathematics 2015 - 2017
- **M.Sc.**, **Electrical Engineering**, Sharif University of Technology, Iran
  Major: Communications 2011 - 2013
- **B.Sc.**, **Electrical Engineering**, Sharif University of Technology, Iran
  Major: Communications 2007 - 2011

RESEARCH INTERESTS

Information Theory, Quantum Information Theory, and Statistical Learning.

HONORS AND AWARDS

- **Michigan Cambridge Research Initiative (MCRI) Award**, 2018
- **ISIT'18 Travel Award**, 2018
- **EECS Department Graduate Student Instructor Award**
  University of Michigan 2017
  An annual award to honor top student instructors and aides for their remarkable service and excellence in teaching.
- **Rackham Travel Grant**, University of Michigan 2015 & 2018
- **EECS Department Graduate Fellowship**,
  University of Michigan 2013
  This fellowship is awarded to new students with outstanding academic background.
- **Exceptional Talent Award**, Sharif University of Technology, Fall 2010
  This award includes honorary admission to M.Sc. program without any entrance exam.
- **Ranked** 40^{th} among more than 125,000 applicants in Iran's nationwide universities entrance exam. Summer 2007
- **Honorable Mention, Khwarizmi Young Festival Award**, 2006
  This award is given annually by the Iranian Research Organization for Science and Technology (IROST) to individuals who have made outstanding achievements in research, innovation and invention, in fields related to science and technology.

TEACHING EXPERIENCES

University of Michigan

- **Section Instructor**,
  EECS 501: Probability and Random Processes — Winter 2017
- **Graduate Student Teaching Assistant**,
  EECS 501: Probability and Random Processes (Prof. Pradhan) — Fall 2018
  EECS 501: Probability and Random Processes (Prof. Pradhan) — Fall 2017
  EECS 501: Probability and Random Processes (Prof. Teneketzeis) — Fall 2016

Sharif University of Technology

- **Teaching Assistant**,
  Communication Circuits — Winter 2012
  Communication Systems — Fall 2011
  Analog Circuits — Fall 2009
- AVR programming for Sharif Robotic Competition — Fall 2010 & 2012

JOURNAL PAPERS

J7 **M. Heidari**, A. Anastasopoulos, S. Pradhan, "*On The Reliability Function of Discrete Memoryless Multiple-Access Channel with Feedback*", pre-print.

J6 **M. Heidari**, G. Shamir, W. Szpankowski, "*Fourier-Based Universal Learning*", JMLR, under review.

J5 T. A. Atif, **M. Heidari**, S. Pradhan, "*Faithful Simulation of Distributed Quantum Measurements with Applications in Distributed Rate-Distortion Theory*", IEEE Transaction on Information Theory, under review.

J4 **M. Heidari**, S. Pradhan,"*Structured Mappings and Conferencing Common Information for Multiple-Access Channels*", in IEEE Transactions on Information Theory, vol. 66, no. 7, pp. 4203-4225, July 2020, doi: 10.1109/TIT.2020.2980550.

J3 **M. Heidari**, F. Shirani, S. Pradhan,"*Quasi Structured Codes for Multi-Terminal Communications*", in IEEE Transactions on Information Theory, vol. 65, no. 10, pp. 6263-6289, Oct. 2019, doi: 10.1109/TIT.2019.2930591.

J2 R. Kazemi, M. Boloursaz, **M.H. Khoozani**, F. Behnia,"*Modem based on sphere packing techniques in high-dimensional Euclidean sub-space for efficient data over voice communication through mobile voice channels*", IET Communications 2015, 9, (4), p. 508-516, DOI: 10.1049/iet-com.2014.0610

J1 **M.H. Khoozani**, F. Marvasti, E. Azghani, M. Ghassemian, "*Finding Sub-Optimum Signature Matrices for Overloaded Code Division Multiple Access Systems*", IET Communications 2013, 7, (4), p. 295-306, DOI: 10.1049/iet-com.2012.0208.

CONFERENCE PROCEEDINGS

C17 **M. Heidari**, A. Padakandla, W. Szpankowski, "*A Theoretical Framework for Learning from Quantum Data*", submitted.

C16 **M. Heidari**, W. Szpankowski, "*A Low Degree Learning Algorithm for Quantum Data via Quantum Fourier*", submitted, available on arXiv:2102.05209

C15 **M. Heidari**, J. Sreeharam, G. Shamir, W. Szpankowski, "*Information Sufficiency via Fourier Expansion*", submitted.

C14 **M. Heidari**, W. Szpankowski, "*On Agnostic PAC Learning using $\mathcal{L}_2$-polynomial Regression and Fourier-based Algorithms*", submitted.

C13 **M. Heidari**, W. Szpankowski, "**M. Heidari**, J. Sreeharam, G. Shamir, W. Szpankowski, "*Finding Relevant Information via a Discrete Fourier Expansion*", submitted.

C12 **M. Heidari**, T. Atif, S. Pradhan,"*Faithful Simulation of Distributed Quantum Measurements*", IEEE International Symposium on Information Theory Proceedings (ISIT), 2019.

C11 **M. Heidari**, R. Venkataramanan, S. Pradhan,"*Boolean Functions with Biased Inputs: Approximation and Noise Sensitivity*", IEEE International Symposium on Information Theory Proceedings (ISIT), 2019.

C10 **M. Heidari**, A. Anastasopoulos, S. Pradhan,"*On The Reliability Function of Discrete Memoryless Multiple-Access Channel with Feedback*", Information Theory Workshop (ITW), 2018, available at arXiv:1801.07777.

C9 **M. Heidari**, F. Shirani, S. Pradhan, "Bounds on the Effective-length of Optimal Codes for Interference Channel with Feedback, IEEE International Symposium on Information Theory Proceedings (ISIT), July 2018.

C8 **M. Heidari**, F. Shirani, S. Pradhan,"*A New Achievable Rate Region for Multiple Access Channel with States*", IEEE International Symposium on Information Theory Proceedings (ISIT), July 2017.

C7 **M. Heidari**, F. Shirani, S. Pradhan,"*On The Necessity of Structured codes for Communications over MAC with Feedback*", IEEE International Symposium on Information Theory Proceedings (ISIT), July 2017.

C6 **M. Heidari**, S. Pradhan,"*How to Compute Modulo Prime-Power Sums*", IEEE International Symposium on Information Theory Proceedings (ISIT), Jun 2016.

C5 **M. Heidari**, F. Shirani, S. Pradhan,"*New Sufficient Conditions for Multiple-Access Channel with Correlated Sources*", IEEE International Symposium on Information Theory Proceedings (ISIT), Jun 2016.

C4 F. Shirani, **M. Heidari**, S. Pradhan, "*Quasi Linear Codes: Application to Point-to-Point and Multi-Terminal Source Coding*", IEEE International Symposium on Information Theory Proceedings (ISIT), Jun 2016.

C3 **M. Heidari**, F. Shirani, S. Pradhan, "*Beyond Group Capacity in Multi-terminal Communications*", IEEE International Symposium on Information Theory Proceedings (ISIT), Jun 2015.

C2 F. Shirani, **M. Heidari**, S. Pradhan, "*New Lattice Codes For Multiple Descriptions*", IEEE International Symposium on Information Theory Proceedings (ISIT), Jun 2015.

C1 **M. H. Khoozani**, A. Rashidinejad, M.H.L Froushani, P. Pad, and F. Marvasti, "*Almost-Optimum Signature Matrices in Binary-Input Synchronous Overloaded CDMA*," 18th IEEE Int. Conf. on Telecommunications (ICT), May 2011.

INVITED TALKs

- CSoI Seminar Series, Spring 2020,
  Feature Selection for Supervised Binary Classification
- University of Main, Oct. 2020,
  Discrete Fourier and Feature Selection
- CSoI Seminar Series, Fall 2019,
  Faithful Simulation of Distributed Quantum Measurements with Applications in Distributed Quantum Computing
- Information Theory and Applications Workshop (ITA), Feb. 2019,
  Feature Selection and Boolean Function Approximation: An Information Theoretic Approach
- Purdue University, Jan. 2019,
  From Communication to Information Processing: An Information Theoretic Prospective

- Conference on Information Sciences and Systems (CISS), March 2018,
  Structured Coding Approach to Multiple-Access Channel with Feedback
- ITA Graduation Day, Feb. 2018,
  Coding Structures for Multiple-Access Channel with Feedback
- University of Michigan Data Science Team (MDST), Feb 2018,
  Quantum Information Theory
- SPEECS Seminar Series, University of Michigan, Jun 2016,
  An Introduction to Quantum Information Theory

SERVICES

- **Organizer:** CSoI Seminar Series, Purdue University, 2019.
- **Reviewer**, IEEE Transactions on Information Theory, IEEE Transactions on Communications, IEEE International Symposium on Information Theory Proceedings (ISIT), Information Theory Workshop (ITW), IET Communications Journal, IEEE ICC, International Conference on New Technologies, Mobility & Security (NTMS).
- **Co-chair**, Information Theory and Applications Workshop (ITA), UCSD, 2015.