

Hamed Hassani

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EXPERIENCE

University of Pennsylvania

- Associate professor, Department of Electrical and Systems Engineering (primary, July 2023 - present); Assistant professor (July 2017 - June 2023)
- Associate professor, Department of Computer and Information Sciences (secondary, July 2023 - present); Assistant professor (July 2017 - June 2023)
- Associate professor, Department of Statistics and Data Science, the Wharton Business School (secondary, July 2023 - present); Assistant professor (Jan 2021 - June 2023)

Simons Institute for the Theory of Computing, UC Berkeley

- Research associate, participating in the program of Foundations of Machine Learning (January-June 2017)

ETH Zürich

- Postdoctoral researcher, Institute of Machine Learning, Department of computer Science (2014-2016)

Princeton University

- Visiting Scholar, Departments of Electrical Engineering and Mathematics (November 2015 - December 2015)

EDUCATION

École Polytechnique Fédérale de Lausanne (EPFL)

- Ph.D. in Computer and Communication Sciences (2008-2013). Dissertation: "Polarization and Spatial Coupling: Two Techniques to Boost Performance". **IEEE Information Theory Society Thomas Cover Dissertation Award**

Sharif University of Technology, Tehran, Iran

- B.Sc. in Electrical Engineering (2002-2007), B.Sc. in Mathematics (2004-2007)

DISTINCTIONS

- IEEE Information Theory Society James L. Massey Research and Teaching Award for Young Scholars, 2023
- IEEE Communications Society & Information Theory Society Joint Paper Award, 2023
- IEEE Information Theory Society Distinguished Lecturer, 2022-23
- NSF CAREER Award, 2020
- Intel Rising Star Faculty Award, 2020
- AFOSR Young Investigator Award, 2019
- Simons Institute (UC Berkeley) Research Fellowship Award, 2016
- IEEE Information Theory Society Thomas M. Cover Dissertation Award, 2014
- IEEE Jack Keil Wolf ISIT Student Paper Award, 2015 (Senior Author)
- IEEE Jack Keil Wolf ISIT Student Paper Award Finalist, 2010

PUBLICATIONS

Book

- (B1) Gabor Braun, Alejandro Carderera, Cyrille W Combettes, Hamed Hassani, Amin Karbasi, Aryan Mokhtari, Sebastian Pokutta, Conditional Gradient Methods, 2022.

Conference Papers

- (C1) Donghwan Lee, Behrad Moniri, Xinmeng Huang, Eedgar Dobriban, Hamed Hassani, Demystifying Disagreement-on-the-Line in High Dimensions, *International Conference on Machine Learning (ICML)*, 2023.
- (C2) Alex Shevchenko, Kevin Kögler, Hamed Hassani, Marco Mondelli, Fundamental Limits of Two-layer Autoencoders, and Achieving Them with Gradient Methods, *International Conference on Machine Learning (ICML)*, 2023.

Oral Presentation

- (C3) Alexander Robey, FABian Lattore, George Pappas, Hamed Hassani, Volkan Cevher, Adversarial Training Should Be Cast as a Non-Zero-Sum Game, *ICML Workshop on Frontiers in Adversarial Learning (AdvML)*, 2023.

Best Paper Award

- (C4) Aritra Mitra, Hamed Hassani, George Pappas, Linear Stochastic Bandits over a Bit-Constrained Channel, *Learning for Dynamics and Control Conference (L4DC)*, 2023.

Oral Presentation

- (C5) Payam Delgosha, Hamed Hassani, Ramtin Pedarsani, Generalization Properties of Adversarial Training for ℓ_0 -Bounded Adversarial Attacks, *Information Theory Workshop (ITW)*, 2023.
- (C6) Zebang Shen, Jiayuan Ye, Anmin Kang, Hamed Hassani, Reza Shokri, Share Your Representation Only: Guaranteed Improvement of the Privacy-Utility Tradeoff in Federated Learning, *International Conference on Learning Representations (ICLR)*, 2023.
- (C7) Eric Lei, Hamed Hassani, Shirin Saeedi Bidokhti, Neural Estimation of the Rate-Distortion Function for Massive Datasets, *IEEE International Symposium on Information Theory (ISIT)*, 2022.
- (C8) Mark Beliaev, Payam Delgosha, Hamed Hassani, Ramtin Pedarsani, Efficient and Robust Classification Under Sparse Attacks, *IEEE International Symposium on Information Theory (ISIT)*, 2022.
- (C9) Aritra Mitra, Arman Adibi, George J Pappas, Hamed Hassani, Collaborative Linear Bandits with Adversarial Agents: Near-Optimal Regret Bounds, *NeurIPS*, 2022.
- (C10) Xingmen Huang, Donghwan Lee, Edgar Dobriban, Hamed Hassani, Collaborative Learning of Distributions under Heterogeneity and Communication Constraints, *NeurIPS*, 2022.
- (C11) Cian Eastwood, Alexander Robey, Shashank Singh, Julius von Kügelgen, Hamed Hassani, George J Pappas, Bernhard Schölkopf, Probable Domain Generalization via Quantile Risk Minimization, *NeurIPS*, 2022.
- (C12) Liam Collins, Hamed Hassani, Aryan Mokhtari, Sanjay Shakkottai, FedAvg with Fine Tuning: Local Updates Lead to Representation Learning, *NeurIPS*, 2022.

- (C13) Alexander Robey, Luiz Chamon, George Pappas, Hamed Hassani, Probabilistically Robust Learning: Balancing Average-and Worst-case Performance, *International Conference on Machine Learning (ICML)*, 2022.
- (C14) Zebang Shen, Zhenfu Wang, Satyen Kale, Alejandro Ribeiro, Aim Karbasi, Hamed Hassani, Self-Consistency of the Fokker-Planck Equation, *Conference on Learning Theory (COLT)*, 2022.
- (C15) Arman Adibi, Aritra Mitra, George J Pappas, Hamed Hassani, Distributed Statistical Min-Max Learning in the Presence of Byzantine Agents, *IEEE Conference on Decision and Control (CDC)*, 2022.
- (C16) Anton Xue, Lars Lindemann, Alexander Robey, Hamed Hassani, George J Pappas, Rajeev Alur, Chordal Sparsity for Lipschitz Constant Estimation of Deep Neural Networks, *IEEE Conference on Decision and Control (CDC)*, 2022.
- (C17) Bruce D Lee, Thomas TCK Zhang, Hamed Hassani, Nikolai Matni, Performance-Robustness Tradeoffs in Adversarially Robust Linear-Quadratic Control, *IEEE Conference on Decision and Control (CDC)*, 2022.
- (C18) Vahid Jamali, Mohammad Fereydounian, Hessam Mahdaviifar, Hamed Hassani, Low-Complexity Decoding of a Class of Reed-Muller Subcodes for Low-Capacity Channels, *IEEE International Conference on Communications (ICC)*, 2022.
- (C19) A. Adibi, A. Mokhtari, H. Hassani, Minimax Optimization: The Case of Convex-Submodular, *Conference on Artificial Intelligence and Statistics (AISTATS)*, 2022. **Oral Presentation**
- (C20) Z. Shen, H. Hassani, S. Kale, A. Karbasi, "Federated Functional Gradient Boosting", *Conference on Artificial Intelligence and Statistics (AISTATS)*, 2022.
- (C21) A. Zhou, F. Tajwar, A. Robey, T. Knowles, G. Pappas, H. Hassani, C. Finn, "Do Deep Networks Transfer Invariances Across Classes?", *International Conference on Learning Representations (ICLR)*, 2022.
- (C22) Alexander Robey, George Pappas, Hamed Hassani "Model-Based Domain Generalization", *Neural Information Processing Systems (NeurIPS)*, 2021.
- (C23) A. Robey, L. Chamon, G. Pappas, H. Hassani, A. Ribeiro, "Adversarial robustness with semi-infinite constrained learning", *Neural Information Processing Systems (NeurIPS)*, 2021.
- (C24) A. Mitra, R. Jaafar, G. Pappas, H. Hassani, "Achieving Linear Convergence in Federated Learning under Objective and Systems Heterogeneity", *Neural Information Processing Systems (NeurIPS)*, 2021.
- (C25) E. Lei, H. Hassani, S. Saeedi Bidokhti, "Out-of-Distribution Robustness in Deep Learning Compression", *International Conference on Machine Learning (ICML) - ITML Workshop*, 2021.
- (C26) L. Collins, H. Hassani, A. Mokhtari, S. Shakkottai Exploiting Shared Representations for Personalized Federated Learning, *International Conference on Machine Learning (ICML)*, 2021.
- (C27) Xingran Chen, Konstantinos Gatsis, Hamed Hassani, Shirin Saeedi Bidokhti, Age of information in random access channels, *IEEE International Symposium on Information Theory (ISIT)*, 2020.
- (C28) Z. Shen, Z. Wang, A. Ribeiro, H. Hassani, Sinkhorn Natural Gradient for Generative Models, *Neural Information Processing Systems (NeurIPS)*, 2020. **Spotlight Presentation**
- (C29) A. Adibi, A. Mokhtari, H. Hassani, Submodular Meta-Learning, *Neural Information Processing Systems (NeurIPS)*, 2020.

- (C30) Z. Shen, Z. Wang, A. Ribeiro, H. Hassani, Sinkhorn Barycenter via Functional Gradient Descent, *Neural Information Processing Systems (NeurIPS)*, 2020.
- (C31) A. Javanmard, M. Soltanolkotabi, H. Hassani, “Precise Tradeoffs in Adversarial Training for Linear Regression”, *Conference on Learning Theory (COLT)*, 2020.
- (C32) H. Taheri, A. Mokhtari, H. Hassani, R. Pedarsani, “Quantized Decentralized Stochastic Learning over Directed Graphs”, *International Conference on Machine Learning (ICML)*, 2020.
- (C33) M. Zhang, L. Chen, A. Mokhtari, H. Hassani, A. Karbasi, “Quantized Frank-Wolfe: Communication-Efficient Distributed Optimization”, *Conference on Artificial Intelligence and Statistics (AISTATS)*, 2020.
- (C34) A. Reiszadeh, A. Mokhtari, H. Hassani, A. Jadbabaie, R. Pedarsani, “Fed-PAQ: A Communication-Efficient Federated Learning Method with Periodic Averaging and Quantization”, *Conference on Artificial Intelligence and Statistics (AISTATS)*, 2020.
- (C35) M. Zhang, Z. Shen, A. Mokhtari, H. Hassani, A. Karbasi, “One Sample Stochastic Frank-Wolfe”, *Conference on Artificial Intelligence and Statistics (AISTATS)*, 2020.
- (C36) M. Zhang, L. Chen, H. Hassani, A. Karbasi, “Black Box Submodular Maximization: Discrete and Continuous Settings”, *Conference on Artificial Intelligence and Statistics (AISTATS)*, 2020.
- (C37) Mohammad Fereydounian; Xingran Chen; Hamed Hassani; Shirin Saedi Bidokhti, Non-asymptotic Coded Slotted ALOHA , *IEEE International Symposium on Information Theory (ISIT)*, 2019.
- (C38) H. Hassani, A. Karbasi, A. Mokhtari, Z. Shen, Stochastic Conditional Gradient++, *Neural Information Processing Systems (NeurIPS)*, 2019.
- (C39) M. Fazlyab, A. Robey, H. Hassani, M. Morari, G. Pappas, “Efficient and Accurate Estimation of Lipschitz Constants for Deep Neural Networks”, *Neural Information Processing Systems (NeurIPS)*, 2019. **Spotlight Presentation**
- (C40) A. Reiszadeh, H. Taheri, A. Mokhtari, H. Hassani, R. Pedarsani, “Robust and Communication-Efficient Collaborative Learning”, *Neural Information Processing Systems (NeurIPS)*, 2019.
- (C41) M. Zhang, L. Chen, H. Hassani, A. Karbasi, Online Continuous Submodular Maximization: From Full-Information to Bandit Feedback, *Neural Information Processing Systems (NeurIPS)*, 2019.
- (C42) H. Jong, B. Schlotfeldt, H. Hassani, M. Morari, D. Lee, G. Pappas, “Learning Q-network for Active Information Acquisition”, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2019.
- (C43) Z. Shen, H. Hassani, C. Mao, H. Qian, A. Ribeiro, “Hessian Aided Policy Gradient”, *International Conference on Machine Learning (ICML)*, 2019.
- (C44) Y. Balaji, H. Hassani, R. Chellappa, S. Feizi, “Entropic GANs meet VAEs: A Statistical Approach to Compute Sample Likelihoods in GANs”, *International Conference on Machine Learning (ICML)*, 2019.
- (C45) M. Fereydounian, V. Jamali, H. Hassani, H. Mahdaviifar, “Channel Coding at Low Capacity”, *IEEE Information Theory Workshop (ITW)*, 2019.
- (C46) A. Gotovos, H. Hassani, S. Jegelka, A. Krause, “Discrete Sampling Using Semi-gradient based Product Mixtures”, *Uncertainty in Artificial Intelligence (UAI)*, 2018. **Oral Presentation**

- (C47) A. Mokhtari, H. Hassani, A. Karbasi, “Decentralized Submodular Maximization: Bridging Discrete and Continuous Settings”, *International Conference on Machine Learning (ICML)*, 2018.
- (C48) L. Chen, C. Harshaw, H. Hassani, A. Karbasi, “Projection-Free Online Optimization with Stochastic Gradient: From Convexity to Submodularity”, *International Conference on Machine Learning (ICML)*, 2018.
- (C49) A. Fazeli, H. Hassani, M. Mondelli, A. Vardy, “Binary Linear Codes with Optimal Scaling and Quasi-Linear Complexity”, *IEEE Information Theory Workshop (ITW)* 2018. **Invited Paper**
- (C50) H. Hassani, S. Kudekar, O. Ordentlich, Y. Polyanskiy, R. Urbanke, “Almost Optimal Scaling of Reed-Muller Codes on BEC and BSC Channels”, *IEEE International Symposium on Information Theory (ISIT)*, 2018.
- (C51) M. Mondelli, S. H. Hassani, and R. Urbanke, “A New Coding Paradigm for the Primitive Relay Channel”, *IEEE International Symposium on Information Theory (ISIT)*, 2018.
- (C52) A. Reiszadeh, A. Mokhtari, H. Hassani, R. Pedarsani, “Quantized Decentralized Consensus Optimization”, *IEEE Conference on Decision and Control (CDC)* 2018.
- (C53) L. Chen, H. Hassani, A. Karbasi, “Online Continuous Submodular Maximization”, *Conference on Artificial Intelligence and Statistics (AISTATS)*, 2018. **Oral Presentation**
- (C54) A. Mokhtari, H. Hassani, A. Karbasi, “Conditional Gradient Method for Stochastic Submodular Maximization: Closing the Gap”, *Conference on Artificial Intelligence and Statistics (AISTATS)*, 2018.
- (C55) A. Singla, H. Hassani, A. Krause, “Learning to Interact with Learning Agents”, *Association for the Advancement of Artificial Intelligence (AAAI) Conference*, 2018.
- (C56) H. Hassani, M. Soltanolkotabi, A. Karbasi, “Gradient Methods for Submodular Maximization”, *Neural Information Processing Systems (NIPS)* 2017.
- (C57) M. R. Karimi, M. Lucic, H. Hassani, A. Krause, “Stochastic Submodular Maximization: The Case for Coverage Functions”, *Neural Information Processing Systems (NIPS)* 2017.
- (C58) S. A. Hashemi, M. Mondelli, H. Hassani, R. Urbanke, W. J. Gross, “Partitioned List Decoding of Polar Codes: Analysis and Improvement of Finite Length Performance”, *IEEE Global Communications Conference (GLOBECOM)*, 2017.
- (C59) D. Achlioptas, H. Hassani, W. Liu, R. Urbanke, “Time-invariant LDPC convolutional codes”, *IEEE International Symposium on Information Theory (ISIT)*, 2017.
- (C60) M. Mondelli, H. Hassani, R. Urbanke, “Construction of Polar Codes with Sub-linear Complexity”, *IEEE International Symposium on Information Theory (ISIT)*, 2017.
- (C61) O. Bachem, M. Lucic, H. Hassani, A. Krause, “Uniform Deviation Bounds for Unbounded Loss Functions like k-Means”, *International Conference on Machine Learning (ICML)*, 2017.
- (C62) L. Chen, H. Hassani, A. Karbasi, “Near-Optimal Active Learning of Halfspaces via Query Synthesis in the Noisy Setting”, *Conference on Artificial Intelligence (AAAI)*, 2017.

- (C63) Y. Chen, H. Hassani, A. Krause, “Near-optimal Bayesian Active Learning with Correlated and Noisy Tests”, *Artificial Intelligence and Statistics Conference (AISTATS)*, 2017. **Oral Presentation**
- (C64) O Bachem, M. Lucic, H. Hassani, A. Krause, “Fast and Provably Good Seedings for K-Means”, *Neural Information Processing Systems (NIPS)*, 2016. **Oral Presentation.**
- (C65) O Bachem, M. Lucic, H. Hassani, A. Krause, “Approximate K-Means++ in Sublinear Time”, *Conference on Artificial Intelligence (AAAI)*, 2016.
- (C66) D. Achlioptas, H. Hassani, N. Macris, R. Urbanke, “Bounds for Random Constraint Satisfaction Problems via Spatial Coupling”, *ACM-SIAM Symposium on Discrete Algorithms (SODA)*, 2016.
- (C67) A. Gotovos, H. Hassani, A. Krause, “Sampling From Probabilistic Submodular Models”, *Neural Information Processing Systems (NIPS)*, 2015. **Oral Presentation.**
- (C68) Y. Chen, H. Hassani, A. Karbasi, A. Krause, “Sequential Information Maximization: When is Greedy Near-optimal?”, *Conference on Learning Theory (COLT)*, 2015.
- (C69) M. Mondelli, H. Hassani, R. Urbanke, “Unified Scaling of Polar Codes: Error Exponent, Scaling Exponent, Moderate Deviations, and Error Floors”, *IEEE International Symposium on Information Theory (ISIT)*, 2015. **IEEE Jack Keil Wolf ISIT Student Paper Award.**
- (C70) J. M. Renes, D. Sutter, S. Hamed Hassani, “Alignment of Polarized Sets”, *IEEE International Symposium on Information Theory (ISIT)*, 2015.
- (C71) M. Mondelli, H. Hassani, R. Urbanke, “How to Achieve the Capacity of Asymmetric Channels”, *Allerton Conference on Communications, Controlled Computing*, 2014.
- (C72) M. Mondelli, H. Hassani, Igal Sason, R. Urbanke, “Achieving Marton’s Region for Broadcast Channels Using Polar Codes”, *IEEE International Symposium on Information Theory (ISIT)*, 2014.
- (C73) M. Mondelli, H. Hassani, R. Urbanke, “From Polar to Reed-Muller Codes: a Technique to Improve the Finite-Length Performance”, *IEEE International Symposium on Information Theory (ISIT)*, 2014.
- (C74) H. Hassani, R. Urbanke, “Universal Polar Codes”, *IEEE International Symposium on Information Theory (ISIT)*, 2014.
- (C75) M. Mondelli, H. Hassani, R. Urbanke, “Scaling Exponent of List Decoders with Applications to Polar Codes”, *IEEE Information Theory Workshop (ITW)*, 2013.
- (C76) W. Liu, H. Hassani, R. Urbanke, “The Least Degraded and the Least Upgraded Channel with respect to a Channel Family”, *IEEE Information Theory Workshop (ITW)*, 2013.
- (C77) H. Hassani, N. Macris, R. Urbanke, “The Space of Solutions of Coupled XOR-SAT Formulae”, *IEEE International Symposium on Information Theory (ISIT)*, 2013.
- (C78) H. Hassani, R. Urbanke, “Polar Codes: Robustness of the Successive Cancellation Decoder with Respect to Quantization”, *IEEE International Symposium on Information Theory (ISIT)*, 2012.
- (C79) Ali Goli, S. Hamed Hassani, Rudiger Urbanke, “Universal Bounds on the Scaling Behavior of Polar Codes”, *IEEE International Symposium on Information Theory*, 2012.

- (C80) R. Pedarsani, H. Hassani, I. Tal, E. Telatar, “On the Construction of Polar Codes”, *IEEE International Symposium on Information Theory (ISIT)*, 2011.
- (C81) H. Hassani, N. Macris, R. Mori, “Near-Concavity of the Growth Rate for Coupled LDPC Chains”, *IEEE International Symposium on Information Theory (ISIT)*, 2011.
- (C82) H. Hassani, N. Macris, R. Urbanke, “Coupled Graphical Models and Their Thresholds”, *IEEE Information Theory Workshop (ITW)*, 2010.
- (C83) H. Hassani, R. Urbanke, “On the Scaling of Polar Codes: I. The Behavior of Polarized Channels”, *IEEE International Symposium on Information Theory (ISIT)*, 2010.
- (C84) H. Hassani, K. Alishahi, R. Urbanke, “On the Scaling of Polar Codes: II. The Behavior of Unpolarized Channels”, *IEEE International Symposium on Information Theory (ISIT)*, 2010. **IEEE Jack Keil Wolf ISIT Student Paper Award Finalist**
- (C85) H. Hassani, S. B. Korada, R. Urbanke, “The Compound Capacity of Polar Codes”, *Allerton Conference on Communications, Controlled Computing*, 2009.

Journal Papers

- (J1) Eric Lei, Hamed Hassani, Shirin Saeedi Bidokhti, Neural Estimation of the Rate-Distortion Function for Massive Datasets, *IEEE Journal on Selected Areas in Information Theory*, 2023.
- (J2) Hamed Hassani, Adel Javanmard The curse of overparametrization in adversarial training: Precise analysis of robust generalization for random features regression, *Submitted to the Annals of Statistics*, 2022.
- (J3) Payam Delgosha, Hamed Hassani, Ramtin Pedarsani, Robust Classification Under ℓ_0 Attack for the Gaussian Mixture Model, *SIAM Journal on Mathematics of Data Science*, 2022.
- (J4) Donghwan Lee, Xinmeng Huang, Hamed Hassani, Edgar Dobriban, T-Cal: An optimal test for the calibration of predictive models, *Submitted to the Journal of Machine Learning Research (JMLR)*, 2022.
- (J5) Xingran Chen, Konstantinos Gatsis, Hamed Hassani, Shirin Saeedi Bidokhti, Age of information in random access channels, *IEEE Transactions on Information Theory*, 2022. **IEEE Communications Society & Information Theory Society Joint Paper Award**
- (J6) Edgar Dobriban, Hamed Hassani, David Hong, Alexander Robey, Provable Tradeoffs for Adversarially Robust Classification, *IEEE Transactions on Information Theory*, 2022.
- (J7) H. Hassani, A. Karbasi, A. Mokhtari, Z. Shen “Stochastic Conditional Gradient++: (Non-)Convex Minimization and Continuous Submodular Maximization”, *SIAM Journal on Optimization*, 2020.
- (J8) A. Fazeli, H. Hassani, M. Mondelli, A. Vardy, “Binary Linear Codes with Optimal Scaling: Polar Codes with Large Kernels”, *IEEE Transactions on Information Theory*, 2020.
- (J9) A. Mokhtari, H. Hassani, A. Karbasi, “Stochastic Conditional Gradient Methods: From Convex Minimization to Submodular Maximization”, *Journal of Machine Learning Research*, 2020.
- (J10) K. Gatsis, H. Hassani, G. J. Pappas, “Latency-Reliability Tradeoffs for State Estimation, *IEEE Transactions on Automatic Control*, 2020.

- (J11) M. Mondelli, H. Hassani, R. Urbanke, “A New Coding Paradigm for the Primitive Relay Channel”, *Entropy*, 2019.
- (J12) A. Reiszadeh, A. Mokhtari, H. Hassani, R. Pedarsani, “Quantized Decentralized Consensus Optimization”, *IEEE Transactions on Signal Processing*, 2019.
- (J13) M. Mondelli, H. Hassani, R. Urbanke, “How to Achieve the Capacity of Asymmetric Channels”, *IEEE Trans. on Information Theory*, 2018.
- (J14) S. A. Hashemi, M. Mondelli, H. Hassani, R. Urbanke, W. J. Gross, “Decoder Partitioning: Towards Practical List Decoding of Polar Codes”, *IEEE Trans. on Communications*, 2018.
- (J15) Y. Chen, H. Hassani, A. Krause, “Near-optimal Bayesian Active Learning with Correlated and Noisy Tests”, *Electronic Journal of Statistics*, 2017.
- (J16) E. Kazemi, H. Hassani, M. Grossglauser, H. Pezeshgi-Modarres, “PROPER: Global Protein-Protein Interaction Network Alignment with Percolation”, *BMC Bioinformatics*, 2016.
- (J17) M. Mondelli, H. Hassani, R. Urbanke, “Unified Scaling of Polar Codes: Error Exponent, Scaling Exponent, Moderate Deviations, and Error Floors”, *IEEE Trans. on Information Theory*, 2016.
- (J18) E. Kazemi, H. Hassani, M. Grossglauser, “Growing a Graph Matching from a Handful of Seeds”, *Proceedings of Very Large Databases Endowment (VLDB)*, 2015.
- (J19) J. M. Renes, D. Sutter, H. Hassani, “Alignment of Polarized Sets”, *IEEE Journal on Selected Areas in Communications: Recent Advances In Capacity Approaching Codes*, 2015.
- (J20) M. Mondelli, H. Hassani, Igal Sason, R. Urbanke, “Achieving Marton’s Region for Broadcast Channels Using Polar Codes”, *IEEE Trans. on Information Theory*, 2015.
- (J21) M. Mondelli, H. Hassani, R. Urbanke, “Scaling Exponent of List Decoders with Applications to Polar Codes”, *IEEE Trans. on Information Theory*, 2015.
- (J22) H. Hassani, K. Alishahi, R. Urbanke, “Finite-length Scaling of Polar Codes”, *IEEE Trans. on Information Theory*, 2014.
- (J23) M. Mondelli, H. Hassani, R. Urbanke, “From Polar to Reed-Muller Codes: a Technique to Improve the Finite-Length Performance”, *IEEE Trans. on Communications*, 2014.
- (J24) H. Hassani, R. Mori, T. Tanaka, R. Urbanke, “Rate-Dependent Analysis of the Asymptotic Behaviour of Channel Polarization”, *IEEE Trans. on Information Theory*, 2013.
- (J25) H. Hassani, N. Macris, R. Urbanke, “Threshold Saturation in Spatially Coupled Constraint Satisfaction Problems”, *Journal of Statistical Mechanics-Theory and Experiment*, 2012.
- (J26) H. Hassani, N. Macris, R. Urbanke, “Chain of Mean Field Models”, *Journal of Statistical Mechanics-Theory and Experiment*, 2012.

SERVICE

Area chair of major conferences in the fields of Machine Learning, Information Theory, and Communications: NeurIPS, ICML, COLT, ICLR, ISIT, ITW, ICC. Regular participant/reviewer in NSF panels. Member of IEEE and AAAI. Member of editorial board at the Journal of Machine Learning Research (JMLR).

RESEARCH SUPPORT

- TRIPODS Phase II: “EnCORE: Institute for Emerging CORE Methods in Data Science”
National Science Foundation
Role: Lead PI from Penn (the institute is joint between Penn, UCLA, UCSD (lead), UT Austin). Dates: 2022-2027
Amount: \$600,000 of \$10,000,000
- NSF AI Institute: “AI Institute for Learning-Enabled Optimization at Scale (TILOS)”
National Science Foundation
Role: Co-Investigator in the Foundations Team (the institute is joint between MIT, Penn, UCSD (lead), UT Austin, Yale). Dates: 2021-2026
Amount: One PhD Student
- NSF CAREER Award: “CAREER: Submodular Optimization in Complex Environments: Theory, Algorithms, and Applications”
National Science Foundation
Role: solo-PI. Dates: 2020-2025
Amount: \$400,000
- Intel’s Rising Start Faculty Award
Intel Research Office
Role: solo-PI.
Amount: \$50,000
- AFOSR Young Investigator Award: “Data Acquisition in Dynamic Environments: A Submodular Perspective”
US AirForce Research Office
Role: solo-PI. Dates: 2020-2023
Amount: \$450,000
- HDR TRIPODS Phase I: “Penn Institute for Foundations of Data Science”
National Science Foundation
Role: Co-Investigator (PI: S. Agarwal, other co-PIs: S. Khanna, A. Roth, W. Su). Dates: 2019-2022
Amount: \$300,000 of \$1,500,000
- NSF CIF Small: “Collaborative Research: Communications in Ultra-Low-Rate Regime: Fundamental Limits, Code Constructions, and Applications”
National Science Foundation
Role: PI (Joint with H. MahdaviFar from U. Michigan). Dates: 2019-2022
Amount: \$250,000 of \$500,000
- NSF CPS Medium: “Rethinking Communication and Control for Low-Latency, High Reliability IoT Devices”
National Science Foundation

Role: co-Investigator (PI: G. Pappas, other co-PI: A. Ribeiro). Dates: 2018-2021

Amount: \$330,000 of \$1,000,000

- NSF CISE Research Initiation Initiative (NSF-CRII): “Low-Complexity Coding at Optimal Length”

National Science Foundation

Role: solo-PI. Dates: 2018-2020

Amount: \$175,000

TEACHING & ADVISING

Courses Taught at Penn

- Deep Learning: A Hands-on Introduction (Fall 2023)
- Statistics for Data Science (Spring 2019, Fall 2019-23 – More than 250 Participants)
- Mathematics of High Dimensional Data with Applications in Machine Learning (Spring 2021)
- Data Mining: Learning from Massive Data Sets (Fall 2017, 2018, 2019, 2020)
- Modern Convex Optimization (Spring 2018)

Courses Taught at ETH Zurich

- Information Theory (Spring 2015, 2016), (Course Satisfaction Score: 4.5/5)

Courses Taught at EPFL

- Advanced Digital Communication (Fall 2016), (Course Satisfaction Score: 4.5/5)

Current Ph.D. Students

- Mohammad Fereydownian (Double-major B.Sc. in Mathematics and EE from Sharif University, Iran), Sept. 2017-May 2023 (expected)
- Alexander Robey, (Double-major BA in Engineering and Mathematics, Swarthmore College, USA), Sept. 2018-present
- Eric Lei (B. Sc. in Electrical and Computer Engineering, Cornell U., Sept 2020-present)
- Xinmeng Huang (B. Sc. in Mathematics, U. Science and Tech., China), Sept 2020-present
- Donghwan Lee (B. Sc. in Mathematics, Seoul National U., South Korea), Sept 2020-present
- Behrad Moniri (B. Sc. in EE from Sharif University) 2021-present
- Sima Noorani (B. Sc. in ECE from Drexel University) 2022-present
- Shayan Kiyani (Double-major B. Sc. in EE and Mathematics from Sharif University) 2022-present
- Mahdi Sabbaghi (Double-major B.Sc. in EE and Physics from Sharif University) 2022-present

Graduated PhD Students

- Arman Adibi (Double-major B.Sc. in Math and EE from Isfahan Institute of Technology, Iran), Sept. 2018-August 2023. Next: Post-doc at Princeton EE.
- Jorge Berreras (Double-major B.Sc. in Mathematics and Economics from Universidad de los Andes - Colombia), Sept 2017-Nov 2022; Next: Post-doc in Duncan Watt's Group at Penn.

Post-Doctoral Scholars

- Aritra Mitra (Next: Assistant Prof at North Carolina State University)
- Zebang Shen (Next: Research Scientist at ETH Zurich)