

Mahdi Haghifam

Curriculum Vitae

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Education

- 2017-present **Ph.D, University of Toronto**, Toronto, Ontario, Canada, (Expected Graduation: Sept. 2022).
Electrical Engineering.
Research area: "Information-Theoretic Analysis of Generalization in Machine Learning"
Advisor: Prof. Daniel M. Roy
- 2014-2016 **M.Sc, Sharif University of Technology**, Tehran, Iran.
Electrical Engineering.
Thesis: "Energy-Efficient Cooperative Data Transmission in the Next Generation of Wireless Communication Networks"
Advisor: Prof. Masoumeh Nasiri-Kenari
- 2010–2014 **B.Sc, Sharif University of Technology**, Tehran, Iran.
Electrical Engineering, Major in Communication Systems.

Publications

* = equal contribution

- Journal Articles
1. **M. Haghifam***, M. N. Krishnan*, A. Khisti, X. Zhu, W. Dan and J. Apostolopoulos, "On Streaming Codes With Unequal Error Protection", IEEE Journal on Selected Areas in Information Theory (Accepted with Minor Revision), 2021.
 2. **M. Haghifam**, V. Y. F. Tan, and A. Khisti, "Sequential Classification with Empirically Observed Statistics", IEEE Transactions on Information Theory (Volume: 67, Issue: 5, May 2021).
 3. **M. Haghifam**, M. Robat Mili, B. Makki, M. Nasiri-Kenari, T. Svensson, "Joint Sum Rate And Error Probability Optimization: Finite Blocklength Analysis", IEEE Wireless Communications Letters (Volume: 6, Issue: 6, Dec. 2017).
- Referred Articles in Machine Learning Conferences
1. **M. Haghifam**, G. K. Dziugaite, S. Moran, D. M. Roy, "Towards a Unified Information–Theoretic Framework for Generalization", Advances in Neural Information Processing Systems 35 (NeurIPS), 2021 (Spotlight, <3% of submissions, # submissions 9k).
 2. G. Neu, G. K. Dziugaite, **M. Haghifam**, D. M. Roy, "Information-Theoretic Generalization Bounds for Stochastic Gradient Descent", Annual Conference on Learning Theory 34 (COLT), 2021 (20% acceptance rate, # submissions 500).
 3. **M. Haghifam**, J. Negrea, A. Khisti, D. M. Roy, G. K. Dziugaite, "Sharpened Generalization Bounds based on Conditional Mutual Information and an Application to Noisy, Iterative Algorithms", Advances in Neural Information Processing Systems 34 (NeurIPS), 2020 (20% acceptance rate, # submissions 9k).
 4. J. Negrea*, **M. Haghifam***, G. K. Dziugaite, A. Khisti, D. M. Roy, "Information-Theoretic Generalization Bounds for SGLD via Data-Dependent Estimates", Advances in Neural Information Processing Systems 33 (NeurIPS), 2019 (20% acceptance rate, # submissions 6k).
- Conference Papers
1. **M. Haghifam**, G. K. Dziugaite, S. Moran, D. M. Roy, "Towards a Unified Information–Theoretic Framework for Generalization", ICML–21 Workshop on Information-Theoretic Methods for Rigorous, Responsible, and Reliable Machine Learning.
 2. **M. Haghifam**, V. Y. F. Tan, and A. Khisti, "Sequential Classification with Empirically Observed Statistics", IEEE Information Theory Workshop 2019, Visby, Gotland, Sweden.
 3. **M. Haghifam**, A. Badr, A. Khisti, X. Zhu, W. Dan and J. Apostolopoulos, "Streaming Codes with Unequal Error Protection against Burst Losses", The 29th Biennial Symposium on Communications (BSC 2018).
 4. **M. Haghifam**, B. Makki, M. Nasiri-Kenari, T. Svensson, "On joint information and energy transfer in relay networks with an imperfect power amplifier", 27th Annual IEEE International Symposium on Personal, Indoor, and Mobile Radio Communications (PIMRC), Valencia, Spain, 2016.
 5. **M. Haghifam**, M. R. Haghifam, B. Safari Chabook, "State estimation in electric distribution networks in presence of distributed generation using the PMUs", CIRED 2012, Lisbon, Portugal

Honors and Awards

- 2021 Top 8% of reviewers at NeurIPS 2021.
- 2021 Doctoral Completion Award from University of Toronto.
- 2021 Ewing Rae graduate scholarship from ECE Department of University of Toronto.
- 2020,2021 Research grant from the Vector Institute for Artificial Intelligence.
- 2021 MITACS Accelerate Fellowship.
- 2020 Visiting Graduate Student, Institute for Advanced Study, Princeton, New Jersey.
- 2019,2021 NeurIPS Travel Grant.
- 2019 MITACS Accelerate Fellowship.
- 2014 Ranked **5th** out of **25,000** participants in nationwide entrance exams for Master's degree in Electrical Engineering, 2014.

Employment

- Nov. 20–March 21 *Research Intern*, Element AI-Service Now, Toronto, Canada.
Supervisor: Dr. Gintare Karolina Dziugaite
- March 20–May 20 *Visiting Researcher*, Institute for Advanced Studies, Princeton, U.S.
- March 20–Present *Graduate Researcher*, Vector Institute for AI, Toronto, Canada.
Supervisor: Prof. Daniel M. Roy
- Feb. 19–May 19 *Research Intern*, Element AI, Toronto, Canada.
Supervisor: Dr. Gintare Karolina Dziugaite
- June 15–Sept. 15 *Visiting Researcher*, Department of Signals and Systems, Chalmers University of Technology, Gothenburg, Sweden.
Supervisors: Prof. Tommy Svensson, Dr. Behrooz Makki

Presentations

- December 21 *Towards a Unified Information–Theoretic Framework for Generalization*
Neural Information Processing Conference, Virtual.
Sharpened Generalization Bounds based on Conditional Mutual Information and an Application to Noisy, Iterative Algorithms
- April 21 Information Theory, Machine Learning and Statistics Seminar, IIMAS, Mexico.
- December 20 Neural Information Processing Conference, Virtual.
Information-Theoretic Generalization Bounds for SGLD via Data-Dependent Estimates
- December 19 Neural Information Processing Conference, Vancouver, Canada.
Sequential Classification with Empirically Observed Statistics
- August 19 IEEE Information Theory Workshop, Visby, Sweden.
Streaming Codes with Unequal Error Protection against Burst Losses
- July 18 IEEE Biennial Symposium on Communication, Toronto, Canada.

Service

- Conference Reviewer IEEE International Symposium on Information Theory (2021,2020,2019). Neural Information Processing Systems (2021). International Conference on Learning Representations (2022).
- Journal Referee IEEE Transactions on Signal Processing and Communications.
- Area Chair Information-Theoretic Methods for Rigorous, Responsible, and Reliable Machine Learning (ITR3), workshop in ICML 2021.

Leadership and Extra-Curricular Activities

- Aug.20–present Executive member of Bahar Charity group at University of Toronto. <https://ulife.utoronto.ca/organizations/view/id/127161>

Teaching

Statistical Learning (ECE1504), Introduction to Machine Learning (ECE421), Introduction to Programming (CSC108)