

AMIR R. ASADI

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RESEARCH INTERESTS

Machine Learning, Information Theory, High-Dimensional Probability and Statistics, Data Compression, Community Detection.

EDUCATION

- **Princeton University**, Princeton, New Jersey, USA.
 - Ph.D. candidate in Electrical Engineering Sep. 2017 to present
 - * Advisor: Prof. Emmanuel Abbe
 - M.A. in Electrical Engineering Sep. 2015 to Sep. 2017
 - * Advisors: Prof. Emmanuel Abbe and Prof. Sergio Verdú
 - GPA: 3.972/4
- **Sharif University of Technology**, Tehran, Iran. Sep. 2010 to Aug. 2015
 - B.Sc. in Electrical Engineering (Communications).
 - * Project advisor: Prof. Amin Gohari
 - B.Sc. in Mathematics.
(Double major program.)
 - Total GPA: 18.48/20
- **Shahid Ejei High School (National Organization for Development of Exceptional Talents)**, Isfahan, Iran. Sep. 2006 to Aug. 2010
 - High School Diploma in Mathematics and Physics

PUBLICATIONS

1. **Asadi, A. R.** & Abbe, E. (2020). A Self-similarity Approach to Neural Network Learning (In Preparation)
2. **Asadi, A. R.**, Abbe, E. & Verdú, S. (2020). Information-Theoretic Chaining Techniques. (In Preparation).
3. **Asadi, A. R.** & Abbe, E. (2020). Maximum Multiscale Entropy and Neural Network Regularization. *arXiv preprint arXiv:2006.14614* (Submitted).

4. **Asadi, A. R.** & Abbe, E. (2020). Chaining Meets Chain Rule: Multilevel Entropic Regularization and Training of Neural Networks. *Journal of Machine Learning Research*, 21(139), 1-32.
5. **Asadi, A. R.**, Abbe, E., & Verdú, S. (2018). Chaining Mutual Information and Tightening Generalization Bounds. *Advances in Neural Information Processing Systems (NeurIPS)* (pp. 7245-7254)
6. **Asadi, A. R.** , Abbe, E., & Verdú, S. (2017). Compressing data on graphs with clusters. *IEEE International Symposium on Information Theory (ISIT) 2017* (pp. 1583-1587)
7. Asadi, M. **Asadi, A. R.** (2014) "On the Failure Probability of Used Coherent Systems". *Communications in Statistics, Theory and Methods*, Vol. 43, pp. 2468-2475.
8. **Asadi, A. R.** (2013), Problem 96.J with solution, *The Mathematical Gazette*, Vol. 97, No. 539, pp. 345-346, United Kingdom. (Available at <https://www.jstor.org/stable/24496830>.)

AWARDS AND HONORS

- Department of Electrical Engineering Teaching Assistant Award, Princeton University (2019)
- Anthony Ephremides Fellowship in Electrical Engineering, Princeton University (2016)
- Iranian Mathematical Olympiad Bronze Medal (2009)
- Winner of the *Tournament of Towns*: International mathematical contest certified by the Russian Academy of Sciences (2009)
- Membership of the Iranian National Elite Foundation (2009-present)

TALKS

- NSF-Simons Collaboration on the Theoretical Foundations of Deep Learning, Dec. 2020
- Department of EECS, Massachusetts Institute of Technology, Dec. 2020
- Center for Data Science, New York University, June 2020
- Laboratoire de Physique, École Normale Supérieure, Paris, May 2020
- Department of Statistical Sciences, University of Toronto, Canada, Apr. 2020
- Department of Engineering, University of Cambridge, UK, Mar. 2020
- Institute for Advanced Study, Princeton, New Jersey, Oct. 2019
(Available at <https://youtu.be/YdYXpaE3Tm0>)
- Microsoft Research AI, Redmond, Washington, Sep. 2019

RESEARCH INTERSHIPS AND VISITS

- Institute of Network Coding, The Chinese University of Hong Kong, Hong Kong, Summer 2014
 - Advisor: Prof. Raymond Yeung
 - Title: Some Schemes for File Dissemination in Networks Employing Linear Network Coding
- Microsoft Research AI, Redmond, Washington, USA, Sep. 2019
 - Host: Prof. Sebastien Bubeck

TEACHING ASSISTANTSHIPS (Princeton University)

- Transmission and Compression of Information (ELE\APC 486), Spring 2017-2018
 - Instructor: Prof. Emmanuel Abbe
- Probability in High Dimension (ORF\APC 550), Fall 2018-2019
 - Instructor: Prof. Ramon van Handel

GRADUATE COURSES (Princeton University)

Course Title	Instructor(s)	Grade
Information Theory	Sergio Verdú	<i>A⁺</i>
Lossless Data Compression	Sergio Verdú	<i>A⁺</i>
Coding Theory and Random Graphs	Emmanuel Abbe	<i>A⁺</i>
Theoretical Machine Learning	Elad Hazan	<i>A</i>
Probability in High Dimension	Ramon van Handel	<i>A</i>
Probability Theory	Ovidiu Calin	<i>A</i>
Theory of Detection and Estimation	Paul Cuff	<i>A</i>
Theory of Algorithms	Robert Tarjan	<i>A</i>
Random Graphs and Networks	Emmanuel Abbe	<i>A</i>
Sparsity, Structure and Inference	Yuxin Chen	<i>A</i>
Information Theory and Machine Learning (Grad Seminar)	Emmanuel Abbe	<i>P</i>
Random Processes in Information Systems	Sergio Verdú	<i>A⁻</i>
New Directions in Theoretical Machine Learning	Sanjeev Arora	<i>AUD</i>
The Probabilistic Method	Noga Alon	<i>AUD</i>
Theory of Detection and Estimation	Sergio Verdú	<i>AUD</i>
Introduction to Statistical Mechanics	Salvatore Torquato & Roberto Car	<i>AUD</i>

ONLINE COURSES (Coursera)

Course Title	Instructor(s)	Institution	Grade
First Course in Python	Charles Severance	University of Michigan	<i>P</i>
Python Data Structures	Charles Severance	University of Michigan	(in progress)

PROFESSIONAL SERVICES

- IEEE Information Theory Workshop 2020 (Reviewer)
- Notices of the American Mathematical Society (Reviewer)
- Neural Information Processing Systems (NeurIPS) Conference 2020 (Reviewer)
- Conference on Learning Theory (COLT) 2020 (Reviewer)
- IEEE International Symposium on Information Theory (ISIT) 2020 (Reviewer)
- IEEE Journal on Selected Areas in Information Theory (Reviewer)
- Conference on Information Sciences and Systems (CISS) 2020 (Technical Program Committee)
- Neural Information Processing Systems (NeurIPS) Conference 2019 (Reviewer)
- IEEE Information Theory Workshop 2019 (Reviewer)

- IEEE Transactions on Information Theory (Reviewer)
- IEEE International Symposium on Information Theory (ISIT) 2018 (Reviewer)
- Conference on Information Sciences and Systems (CISS) 2018 (Reviewer)
- IEEE International Symposium on Information Theory (ISIT) 2016 (Reviewer)

SCHOOLS

- East Asian School of Information Theory, Hong Kong, July 7-11, 2014
- North American School of Information Theory, Durham, NC, June 21-23, 2016
- North American School of Information Theory, College Station, TX, May 20-23, 2018
- North American School of Information Theory, Boston, MA, July 2-5, 2019

PROGRAMMING LANGUAGES

- MATLAB
- C++
- Python and Keras
- \LaTeX