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Updated in May 2025

RESEARCH INTERESTS

- Machine Learning
- Differential Privacy
- Information Theory
- Statistics

EMPLOYMENT

- Leverhulme Early Career Fellow and Isaac Newton Trust Fellow
Statistical Laboratory,
Department of Pure Mathematics and Mathematical Statistics,
University of Cambridge
Sep. 2023 to present
- Research Associate
Statistical Laboratory,
Department of Pure Mathematics and Mathematical Statistics,
University of Cambridge
– Mentors: Prof. Po-Ling Loh and Dr. Varun Jog
Oct. 2021 to Aug. 2023

ACADEMIC AFFILIATION

- Postdoctoral Affiliate
Trinity College Cambridge
Jan. 2022 to present

EDUCATION

- Princeton University
 - Ph.D. in Electrical and Computer Engineering
Sep. 2017 to Sep. 2021
 - * Advisor: Prof. Emmanuel Abbe
 - * Dissertation Title:
“Neural Network Learning: A Multiscale-Entropy and Self-Similarity Approach”
 - M.A. in Electrical and Computer Engineering
Sep. 2015 to Sep. 2017
 - * Advisors: Prof. Emmanuel Abbe and Prof. Sergio Verdú

* GPA: 3.972 out of 4

- Sharif University of Technology

- B.Sc. in Mathematics
- B.Sc. in Electrical Engineering (Communications)

- * Project Title: Some Schemes for File Dissemination in Networks Employing Linear Network Coding

- * Project Advisor: Dr. Amin A. Gohari

- * Total GPA: 18.48 out of 20

Sep. 2010 to Aug. 2015

PUBLICATIONS

- G. Aminian, **A. R. Asadi**, I. Shenfeld & Y. Mroueh. (2025) Theoretical Analysis of KL-regularized RLHF with Multiple Reference Models. *arXiv preprint arXiv:2502.01203*
- G. Aminian, **A. R. Asadi**, T. Li, A. Beirami, G. Reinert & S. N. Cohen (2024) Generalization Error of the Tilted Empirical Risk. (*To appear in the International Conference on Machine Learning 2025*)
- A. Pensia, **A. R. Asadi**, V. Jog & P. Loh. (2024) Simple Binary Hypothesis Testing under Local Differential Privacy and Communication Constraints. *IEEE Transaction on Information Theory*.
- **A. R. Asadi**. (2024) An Entropy-Based Model for Hierarchical Learning. *Journal of Machine Learning Research*, 25(187), pp. 1-45.
- **A. R. Asadi** & P. Loh (2024) Entropic Regularization of Neural Networks: Self-Similar Approximations. *Journal of Statistical Planning and Inference*, 233, p.106181.
- **A. R. Asadi** & P. Loh (2023) On the Gibbs Exponential Mechanism and Private Data Generation. *IEEE International Symposium on Information Theory (ISIT) 2023*.
- A. Pensia, **A. R. Asadi**, V. Jog & P. Loh. (2023) Simple Binary Hypothesis Testing under Local Differential Privacy and Communication Constraints. *Conference on Learning Theory (COLT)*.
- **A. R. Asadi** & E. Abbe. (2022) Maximum Multiscale Entropy and Neural Network Regularization. *arXiv preprint arXiv:2006.14614*
- **A. R. Asadi** & E. Abbe. (2020) Chaining Meets Chain Rule: Multilevel Entropic Regularization and Training of Neural Networks. *Journal of Machine Learning Research*, 21(139), pp. 1-32.
- **A. R. Asadi**, E. Abbe, & S. Verdú. (2018) Chaining Mutual Information and Tightening Generalization Bounds. *Advances in Neural Information Processing Systems (NeurIPS)*, pp. 7245-7254.
- **A. R. Asadi**, E. Abbe, & S. Verdú, (2017) Compressing Data on Graphs with Clusters. *IEEE International Symposium on Information Theory (ISIT)*, pp. 1583-1587.
- M. Asadi, & **A. R. Asadi**. (2014) On the Failure Probability of Used Coherent Systems. *Communications in Statistics, Theory and Methods*, Vol. 43, pp. 2468-2475.
- **A. R. Asadi** (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>.)
- Ph.D. Dissertation:
A. R. Asadi (2021) *Neural Network Learning: A Multiscale-Entropy and Self-Similarity Approach*, Princeton University.

AWARDS AND HONOURS

- Leverhulme Early Career Fellowship from the Leverhulme Trust and the Isaac Newton Trust (2023-present)
- Teaching Assistant Award from the Department of Electrical and Computer Engineering at Princeton University (2019)
- Anthony Ephremides Fellowship from the Graduate School at 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

- Chennai Mathematical Institute, Chennai, India. January 2025
- Department of Mathematical Sciences, Durham University, Durham, UK. May 2023
- Department of Mathematics and Statistics, Lancaster University, Lancaster, UK. Feb. 2023
- Statistical Laboratory, University of Cambridge, Cambridge, UK. Feb. 2023
- Department of Computer Science, ETH Zürich, Switzerland. Feb. 2021
- NSF-Simons Collaboration on the Theoretical Foundations of Deep Learning. Dec. 2020
- Department of EECS, Massachusetts Institute of Technology, Cambridge, Massachusetts, USA. Dec. 2020
- Center for Data Science, New York University, New York, USA. June 2020
- Laboratoire de Physique, École Normale Supérieure, Paris, France. May 2020
- Department of Statistical Sciences, University of Toronto, Toronto, Canada. Apr. 2020
- Department of Engineering, University of Cambridge, Cambridge, UK. Mar. 2020
- Institute for Advanced Study, Princeton, New Jersey, USA. Oct. 2019
(Available at <https://youtu.be/YdYXpaE3Tm0>)
- Microsoft Research AI, Redmond, Washington, USA. Sep. 2019

PROFESSIONAL SERVICES

- Co-organizer of the 1st Cambridge Information Theory Colloquium, 21 April 2023.
- Co-organizer of the 2nd Cambridge Information Theory Colloquium, 10 May 2024.
<http://sigproc.eng.cam.ac.uk/CITC/>
- Co-organizer of the 8th London Symposium on Information Theory, 14-16 May 2025.
- Reviewer for:
 - Journal of Machine Learning Research (JMLR)
 - IEEE Transactions on Information Theory
 - Journal of Statistical Planning and Inference
 - Journal of Selected Areas on Information Theory (JSAIT)
 - Conference on Neural Information Processing Systems (NeurIPS)
 - Conference on Learning Theory (COLT)
 - International Symposium on Information Theory (ISIT)
 - International Conference on Machine Learning (ICML)

- International Conference on Learning Representations (ICLR)
- Information Theory Workshop (ITW)
- Conference on Information Sciences and Systems (CISS)
- Notices of the American Mathematical Society
- Conference on Uncertainty in Artificial Intelligence (UAI)

RESEARCH INTERNSHIPS AND VISITS

- Institute of Network Coding, The Chinese University of Hong Kong, Hong Kong, Summer 2014
 - Host: Prof. Raymond Yeung
- Microsoft Research AI, Redmond, Washington, USA, Sep. 2019
 - Host: Prof. Sebastien Bubeck