Vinod Raman

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https://vinodkraman.github.io

Education

University of Michigan — Ann Arbor, MI
PhD Student in Statistics — 2021 - 2026
Thesis Advisor: Ambuj Tewari

University of Michigan — Ann Arbor, MI
BSE Computer Science, BSE Chemical Engineering — 2015 - 2020
Thesis Advisors: Mahdi Cheraghchi, Sindhu Kutty, Andrej Lenert

Industry Experience

Google Research — New York City, NY
Research Intern — June - Sept. 2025

- Working with Matthew Joseph on topics in differentially private machine learning

Apple — New York City, NY
AIML Research Intern — Feb. - June 2025

- Working with Kunal Talwar on the learning theoretic foundations of generation
- Working with Hilal Asi and Satyen Kale on efficient LLM alignment and reasoning
- Work resulted in submission to NeurIPS 2025

Apple — Cupertino, CA
AIML Research Intern — May - Aug. 2024

- Worked with Kunal Talwar and Hilal Asi on differentially private adversarial bandits and privately tracking the best expert
- Worked with Parikshit Gopalan on the communication complexity of uniform convergence
- Work resulted in two papers in ICML 2025

Amazon — Seattle, WA
Software Engineering Intern — May 2021

- Used React to design a mobile user dashboard for the Alexa Fashion team

Wove — San Francisco, CA
Software Engineering Intern — May - Aug. 2019

- Deployed bot-detection mechanism in Java and Ruby to improve the robustness of customer interaction data against web crawlers
- Engineered and deployed Beta distribution priors for estimating click-to-conversion rates of new ad-placements in Java
- Implemented contextual bandit algorithms for improving click-through-rate and helped design an off-policy bandit evaluation framework in Python

Software

- **Programming:** Python, C++, Java, Javascript, Matlab, React Native
- **Frameworks:** PyTorch, Tensorflow, DialogFlow, MapReduce, Hadoop, Mockito

Publications

*denotes equal contribution

1. J. Li*, **V.Raman***, A. Tewari. Generation through the lens of learning theory.
   Conference on Learning Theory (COLT), 2025
   https://arxiv.org/abs/2410.13714

2. A. Raman*, **V.Raman***. Generation from Noisy Examples.
   International Conference on Machine Learning (ICML), 2025
   https://arxiv.org/abs/2501.04179

3. C. Peale*, **V.Raman***, O. Reingold*. Representative Language Generation.
   International Conference on Machine Learning (ICML), 2025
   https://openreview.net/forum?id=BiXwdXZxs7

4. H. Asi*, **V.Raman***, A. Saha*. Tracking the Best Expert Privately.
   International Conference on Machine Learning (ICML), 2025
   https://arxiv.org/abs/2503.09889

5. H. Asi*, **V.Raman***, K. Talwar*. Faster Rates for Private Adversarial Bandits.
   International Conference on Machine Learning (ICML), 2025

6. **V.Raman***, U.Subedi*, A.Tewari. The Complexity of Sequential Prediction in Dynamical Systems.
   Oral at *Conference on Learning for Dynamics and Control (L4DC)*, 2025.
   https://arxiv.org/abs/2402.06614

7. **V.Raman***, U.Subedi*, A.Tewari. A Unified Theory of Supervised Online Learnability.
   Outstanding Paper Award at *Conference on Algorithmic Learning Theory (ALT)*, 2025.
   https://arxiv.org/abs/2307.03816

8. **V.Raman**, A.Tewari. A Characterization of Multiouput Learnability.
   Journal of Machine Learning Research (JMLR), 2024.
   https://arxiv.org/abs/2301.02729

9. **V.Raman**, A.Tewari. Online Classification with Predictions.
   Conference on Neural Information Processing Systems (NeurIPS), 2024.
   https://arxiv.org/abs/2405.14066

10. S.Hanneke*, **V.Raman***, A. Shaeiri*, U.Subedi*. Multiclass Transductive Online Learning.
    Spotlight at *Conference on Neural Information Processing Systems (NeurIPS)*, 2024.

11. **V.Raman***, U.Subedi*, A.Tewari. Smoothed Online Classification can be Harder than Batch Classification.
    Conference on Neural Information Processing Systems (NeurIPS), 2024.
    https://arxiv.org/pdf/2405.15424

12. **V.Raman***, U.Subedi*, A. Raman, A.Tewari. Apple Tasting: Combinatorial Dimensions and Minimax Rates.
    Conference on Learning Theory (COLT), 2024.
    https://arxiv.org/abs/2310.19064

13. **V.Raman***, U.Subedi*, A.Tewari. Online Learning with Set-Valued Feedback.
    Conference on Learning Theory (COLT), 2024.
    https://arxiv.org/abs/2306.06247

14. **V.Raman***, U.Subedi*, A.Tewari. Online Infinite-Dimensional Regression: Learning Linear Operators.
    Conference on Algorithmic Learning Theory (ALT) 2024.
    https://arxiv.org/abs/2309.06548

15. A.Raman, **V.Raman***, U.Subedi*, I.Mehalel*, A.Tewari. Multiclass Online Learnability under Bandit Feedback.
Conference on Algorithmic Learning Theory (ALT) 2024. https://arxiv.org/abs/2308.04620

16. **V.Raman***, U.Subedi*, A.Tewari. On Proper Learnability between Average- and Worst-case Robustness.
Conference on Neural Information Processing Systems (NeurIPS) 2023.
https://arxiv.org/abs/2211.05656

17. **V.Raman***, U.Subedi*, A.Tewari. On the Learnability of Multilabel Ranking.
Spotlight at *Conference on Neural Information Processing Systems (NeurIPS)* 2023.
https://arxiv.org/abs/2304.03337

18. S.Hanneke*, S.Moran*, **V.Raman***, U.Subedi*, A.Tewari. Multiclass Online Learning and Uniform Convergence.
Conference on Learning Theory (COLT) 2023.
https://arxiv.org/abs/2303.17716

19. **V.Raman**, A.Tewari. Online Agnostic Multiclass Boosting.
Conference on Neural Information Processing Systems (NeurIPS) 2022.
https://arxiv.org/abs/2205.15113

20. **V.Raman**, T.Burger, A.Lenert. Design of thermophotovoltaics for tolerance of parasitic absorption.
Optics Express, 27(22):31757–31772, 2019.
https://doi.org/10.1364/OE.27.031757

Works In Submission

1. **V. Raman**, H. Asi, S. Kale. ABoN: Adaptive Best-of-N Alignment.
In Submission, 2025
https://arxiv.org/abs/2505.12050

2. S. Somerstep, **V. Raman**, U. Subedi, Y. Sun. Learning to Choose or Choosing to Learn: Best-of-N vs. Supervised Fine-Tuning for Bit String Generation.
In Submission, 2025

Awards & Scholarships

Apple Scholars in AI/ML PhD Fellowship 2025
MSSISS Best Oral Presentation (University of Michigan) 2024
NeurIPS Scholar Award 2022-2023
Outstanding First-Year Ph.D. Student (University of Michigan) 2022
Departmental Outstanding GSI Team Award (University of Michigan) 2022
NSF Graduate Research Fellowship 2022
First-year Rackham Fellowship (University of Michigan) 2021
American Statistical Association Best Poster Award (University of Michigan) 2020
Landes Prize in Technical Communication (University of Michigan) 2019
Future Leaders In Chemical Engineering 2018
Bandemer Scholarship (University of Michigan) 2018
Pursley Scholarship (University of Michigan) 2017
A.H. White Scholarship (University of Michigan) 2017
James B. Angell Scholar (University of Michigan) 2017-2019
Dean's List (University of Michigan) 2015-2020

Talks

1. Lower Bounds for Differential Privacy Under Continual Observation and Online Threshold Queries. *COLT*, 2024.
2. Apple Tasting: Combinatorial Dimensions and Minimax Rates. *COLT*, 2024.
3. Trichotomies in Online Learnability. *Apple MLR Reading Group*, 2024
4. Revisiting the Learnability of Apple Tasting. *Michigan Student Symposium for Interdisciplinary Statistical Sciences (MSSISS)*, 2024.
5. Multiclass Online Learnability under Bandit Feedback. *ALT*, 2024.
6. Multiclass Online Learning and Uniform Convergence. *University of Michigan EECS Theory Seminar*, 2024.
7. On Classification-Calibration of Gamma-Phi Losses. *COLT*, 2023.

References

1. **Ambuj Tewari**, Professor, Statistics, University of Michigan, Ann Arbor MI, USA.
   Email: tewaria@umich.edu | *Phone*: 734-615-0928
2. **Steve Hanneke**, Assistant Professor, Computer Science, Purdue University, West Lafayette IN, USA.
   Email: steve.hanneke@gmail.com
3. **Mahdi Cheraghchi**, Associate Professor, Computer Science, University of Michigan, Ann Arbor MI, USA.
   Email: mahdich@umich.edu | *Phone*: 734-763-9165
4. **Sindhu Kutty**, Lecturer III, Computer Science, University of Michigan, Ann Arbor MI, USA.
   Email: skutty@umich.edu | *Phone*: 734-647-8821