

Vinod Raman

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<https://vinodkraman.github.io>

Education

University of Michigan

PhD Statistics

Thesis Advisor: Ambuj Tewari

Research Areas: Machine Learning Theory, Differential Privacy, Language Generation

Ann Arbor, MI

2021 - 2026

University of Michigan

BSE Computer Science, BSE Chemical Engineering

Thesis Advisors: Mahdi Cheraghchi, Sindhu Kutty, Andrej Lenert

Research Areas: Submodular Optimization, Bandits, Thermophotovoltaics

Ann Arbor, MI

2015 - 2020

Industry Experience

Google Research

Research Intern

New York City, NY

June - Sept. 2025

- Working with Matthew Joseph, Travis Dick, and Umar Syed on topics in differential privacy, reasoning, and synthetic data

Apple

Research Intern

New York City, NY

Feb. - June 2025

- Worked with Kunal Talwar and Satyen Kale on missing mass estimation
- Worked with Hilal Asi and Satyen Kale on efficient LLM alignment and reasoning

Apple

Research Intern

Cupertino, CA

May - Aug. 2024

- Worked with Kunal Talwar and Hilal Asi on differentially private adversarial bandits and dynamic regret
- Worked with Parikshit Gopalan on the communication complexity of uniform convergence

Wove

Software Engineering Intern

San Francisco, CA

May - Aug. 2019

- Deployed bot-detection mechanism in Java to improve the robustness against web crawlers
- Engineered 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 implemented an off-policy bandit evaluation framework in Python

Awards & Fellowships

- ALT Outstanding Paper Award, 2025
- Apple Scholars in AI/ML PhD Fellowship, 2025
- Outstanding First-Year Ph.D. Student, 2022
- NSF Graduate Research Fellowship, 2022

Software

- **Programming:** Python, C++, Java, Javascript, Matlab, React Native
- **Frameworks/Libraries:** PyTorch, Tensorflow, HuggingFace

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://arxiv.org/abs/2505.21819>
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
<https://arxiv.org/abs/2505.21790>
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 Multioutput 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
<https://www.arxiv.org/abs/2505.17288>

Talks

1. A Unified Theory of Supervised Online Learning. *ALT*, 2025.
2. Generation through the lens of learning theory. *Apple MLR Reading Group*, 2025.
3. Lower Bounds for Differential Privacy Under Continual Observation and Online Threshold Queries. *COLT*, 2024.
4. Apple Tasting: Combinatorial Dimensions and Minimax Rates. *COLT*, 2024.
5. Trichotomies in Online Learnability. *Apple MLR Reading Group*, 2024
6. Revisiting the Learnability of Apple Tasting. *Michigan Student Symposium for Interdisciplinary Statistical Sciences (MSSISS)*, 2024.

7. Multiclass Online Learnability under Bandit Feedback. *ALT*, 2024.
8. Multiclass Online Learning and Uniform Convergence. *University of Michigan EECS Theory Seminar*, 2024.
9. 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