# 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

- Worked with Kunal Talwar on the learning theoretic foundations of generation
- Worked with Hilal Asi and Satyen Kale on efficient LLM alignment and reasoning
- Work resulted in a paper currently in submission at 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/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://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.
   <span style="color:red">Oral</span> 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.
   <span style="color:red">Outstanding Paper Award</span> 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.
    <span style="color:red">Spotlight</span> 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