Vinod Raman

vkraman@umich.edu | https://vinodkraman.github.io

Education

University of Michigan — Ann Arbor, MI
PhD Student in Statistics — *2021 - Present*

University of Michigan — Ann Arbor, MI
BSE Computer Science, BSE Chemical Engineering — *2015 - 2020*
Summa Cum Laude

Research Experience

Graduate Student Researcher — Ann Arbor, MI
Advisor: Prof. Ambuj Tewari — *Aug. 2021 - Present*

- A Characterization of Multioutput Learnability
- Probabilistically Robust PAC Learning
- Online Agnostic Multiclass Boosting

Undergraduate Student Researcher — Ann Arbor, MI
Advisors: Prof. Ambuj Tewari, Prof. Mahdi Cheraghchi — *May 2020 - Aug. 2020*

- Online Boosting for Multilabel Ranking with Top-k Feedback
- Deletion-Robust Submodular Maximization

Undergraduate Student Researcher — Ann Arbor, MI
Advisors: Prof. Andrej Lenert, Dr. Sindhu Kutty — *May 2018 - Dec. 2019*

- Friend-or-Foe: Learning with Limited-Feedback and Mixed Quality Advice
- Design of thermophotovoltaics for tolerance of parasitic absorption

Industry Experience

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 multi-armed bandit algorithms for improving click-through-rate and helped design an off-policy bandit evaluation framework in Python

Vertex Pharmaceuticals — Boston, MA
Data Intern — *May - Aug. 2018*

- Built a standalone Matlab GUI automating the extraction, cleaning, visualization, and process control trending of raw continuous manufacturing data from Excel and OSIsoft PI databases
- Achieved a 92% reduction in labor hours in production

Teaching and Service

Graduate Student Instructor Ann Arbor, MI
Instructor *Aug. 2021 - Present*

- Taught STATS 250, STATS 315, and STATS 507
- Lead an interactive laboratory of 30+ students where I teach introductory statistics concepts
- Designed introductory deep learning course for statistics students

AI4ALL Ann Arbor, MI
Instructor *May 2021 - Present*

- Created interactive lecture material, programming exercises, and fun games on ML topics related to data wrangling and classification
- Lectured and led 30+ highschool on data wrangling and classification
- Developed a novel way of introducing machine learning concepts to students via fill in the blank coding notebooks, and received extremely positive feedback from students

InspiritAI Remote
Instructor *May 2021 - Present*

- Lectured 100+ highschool students across the globe on various ML topics including regression, classification, computer vision, and NLP
- Led 100+ highschool students through "AI for social-good" projects, where my students built convolutional neural networks capable of detecting pneumonia from Xrays and emotions from faces.
- Improved curriculum by identifying bugs in coding notebooks and adding information to lecture slides

Chemical and Engineering Thermodynamics Ann Arbor, MI
Tutor *Jan. - May 2018*

- Organized bi-weekly office hours and review sessions for 100+ students
- Helped create exam, quiz, and homework questions

Publications

*denotes equal contribution

1. **V.Raman**, U.Subedi, and A.Tewari. Probabilistically Robust PAC Learning. *NeurIPS (ML Safety Workshop)*, 2022. https://arxiv.org/abs/2211.05656
2. **V.Raman**, A.Tewari. Online Agnostic Multiclass Boosting. *NeurIPS*, 2022. https://arxiv.org/abs/2205.15113
3. **V.Raman**, T.Burger, and 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

Preprints

*denotes equal contribution

1. **V.Raman***, U.Subedi*, and A.Tewari. A Characterization of Multilabel Learnability. *Preprint*, 2023. https://arxiv.org/abs/2301.02729
2. **V.Raman***, D.Zhang*, Y.Jung, and A.Tewari. Online Boosting for Multilabel Ranking with Top-k Feedback. *Preprint*, 2020. https://arxiv.org/abs/1910.10937

Presentations

1. **V.Raman**, S.Kutty, "Friend-or-Foe: Learning with Limited-Feedback and Mixed Quality Advice", Michigan Student Symposium for Interdisciplinary Statistical Sciences, Ann Arbor, MI, February 28, 2020 (Best Poster Award)

2. **V.Raman**, T.Burger, A.Lenert, "Impact of Heterogeneous Surface Absorption on Thin-Film Thermophotovoltaic Devices", Future Leaders in Chemical Engineering, Raleigh, NC, October 21-22, 2018 (Poster)

Awards, Scholarships & Honors

NeurIPS 2022 Scholar Award 2022
Outstanding First-Year Ph.D. Student 2022
Departmental Outstanding GSI Team Award 2022
NSF Graduate Research Fellowship 2022
First-year Rackham Fellowship 2021
American Statistical Association Best Poster Award 2020
Landes Prize in Technical Communication 2019
Future Leaders In Chemical Engineering 2018
Bandemer Scholarship 2018
Pursley Scholarship 2017
A.H. White Scholarship 2017
James B. Angell Scholar 2017-2019
Dean's List 2015-2020

Skills

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

References

1. **Ambuj Tewari**, Professor, Statistics, University of Michigan, Ann Arbor MI, USA.
   Email: tewaria@umich.edu | *Phone*: 734-615-0928

2. **Mahdi Cheraghchi**, Associate Professor, Computer Science, University of Michigan, Ann Arbor MI, USA.
   Email: mahdich@umich.edu | *Phone*: 734-763-9165

3. **Sindhu Kutty**, Lecturer III, Computer Science, University of Michigan, Ann Arbor MI, USA.
   Email: skutty@umich.edu | *Phone*: 734-647-8821

4. **Andrej Lenert**, Associate Professor, Chemical Engineering, University of Michigan, Ann Arbor MI, USA.
   Email: alenert@umich.edu | *Phone*: 734-647-4107