Rithvik Rao

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Education

Harvard University, Cambridge, MA **August 2018–May 2022**

- A.B. (Bachelor's) Candidate in Computer Science and Mathematics, Secondary Candidate in Economics
- Intended fourth-year S.M. (Master's) Candidate in Computer Science
- Graduate Coursework: Probability; Advanced Machine Learning; Spectral Graph Theory; Blockchain and Cryptocurrencies; Data Visualization; Economic Theory; Social and Economic Networks; Market Design
- Additional Coursework: Data Structures and Algorithms; Economics and Computation; Programming Languages; Linear Algebra and Real Analysis; Measure Theory and Function Spaces; Mathematics for Computation, Statistics, and Data Science; Advanced Micro and Macroeconomics (Econ 1011a/b); Game Theory

Work Experience

MLH Fellow (Scikit-learn and Keras Contributor), Remote **June 2020–August 2020**

- Contributed to open-source machine learning projects as part of fellowship sponsored by Major League Hacking, GitHub, Facebook. Wrote and documented optimizations for linear and logistic regression.

Course Staff in Computer Science, Harvard University

- **Head Course Assistant of CS 50 (Intro to Computer Science) February 2020–Present**
  - Developing curriculum, teaching section, holding office hours for Harvard's largest course of 800 students. Hiring and leading 75 staff members. Previously Teaching Fellow (Fall 2019).
- **Teaching Fellow of CSCI E-80 (Artificial Intelligence in Python) January 2020–May 2020**
  - Developing curriculum for first offering, leading Zoom section, grading, holding office hours.
- **Teaching Fellow of CS 234r (Graduate Computation for Networks) January 2021–May 2021**
  - Developing curriculum, giving one lecture, grading problem sets, holding office hours, advising projects.

Research

Blockchain: Modeling proof-of-stake with game theory, reinforcement learning. **Prof. David Parkes**

- Neuder, M., Moroz, D.J., Rao, R. & Parkes, D.C. (2020) "Selfish Behavior in the Tezos Proof-of-Stake Protocol." *Cryptoeconomic Systems*, Issue 0 (MIT Press). Featured in Yahoo Finance. arXiv: tezos.rrao.me
- Neuder, M., Moroz, D.J., Rao, R. & Parkes, D.C. (2020) "Defending Against Malicious Reorgs in Tezos Proof-of-Stake." AFT '20: ACM Conference on Advances in Financial Technologies. arXiv: tezos2.rrao.me
- Neuder, M., Moroz, D.J., Rao, R. & Parkes, D.C. (2020) "Low-cost attacks on Ethereum 2.0 by sub-1/3 stakeholders." GTiB '20: Workshop on Game Theory in Blockchain (WINE 2020).

Networks: Research assistance and original work in social learning, network games. **Prof. Ben Golub**

Projects

Membership Inference Attacks in New Domains, mia.rrao.me **December 2019**

- Studied differential privacy results in interpolating regime, new distance metrics, high-dimensional models.

Combinatorial Auctions for Fantasy Sports Drafts, drafts-ca.rrao.me **December 2019**

- Proposed and analyzed auction mechanisms for fantasy sports drafts, including Python simulation.

2017 NFL Season Data Analysis in R, nfl-r.rrao.me **May 2019**

- Analyzed play-by-play NFL data using classical statistical and simulation methods in R.

AR Connect-Four, ar-c4.rrao.me **December 2018**

- Used C# with Unity game engine to create playable augmented reality Connect-Four board with CPU player.

Skills

Concepts: Machine Learning, Blockchain, Algorithms, Probability, Mathematical Modeling

Programming and Scripting Languages: Python, C, R, HTML/CSS, Bash, C#, Java, JavaScript, LaTeX