Praveen Nair

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Research interests

Algorithmic fairness & impact, causal inference, interpretability

Education

2022 – 2024	**University of California, San Diego** – La Jolla, CA **M.S., Computer Science and Engineering** Thesis: "Active Learning and Epistemic Defenses of Fairness." Advisor: David Danks. *GPA: 3.83.*
2018 – 2022	**University of California, San Diego** – La Jolla, CA **B.S., Data Science**, minors in history & linguistics, concentration in political science *GPA: 3.961, Magna Cum Laude*

Publications

2022	**Engagement in online learning: student attitudes and behavior during COVID-19** Brooke Hollister*, **Praveen Nair***, Sloan Hill-Lindsay, Leanne Chukoskie. *Frontiers in Education.* https://doi.org/10.3389/feduc.2022.851019

Research experience

Sep 2023 - Present	**ION-C: Integration of Overlapping Networks with Constraints** Work with David Danks, Sergey Plis. **Paper under review.** Answer-set programming formulation of ION algorithm for performing causal discovery across datasets with overlapping variables. Designed simulations, implemented causal learning algorithms, and collected & reviewed results. Problem formulated in ASP system *clingo*, work in Python and Slurm.

March 2023 - Jun 2024	**Thesis: Active Learning and Epistemic Defenses of Fairness** Advisor: David Danks (Data Science & Philosophy). Used active learning and causal modeling to demonstrate that even with optimal, unbiased models, differences in true group parameters can lead to large differences in uncertainty when outcomes observed dependent on decisions. Used Bayesian causal modeling with r-blavaan, and formulated mutual information statistic for our setting.
June 2021 - June 2022	**Stowers Lab, Scripps Research Institute** PI: Lisa Stowers. Used ML tools such as DeepLabCut and B-SOID on remote computing cluster, extracted pose information from mouse behavior video, timeseries analysis. Supported projects studying neurological underpinnings of physiological arousal, mouse scent marking, and olfaction.
June 2021 - December 2021	**UC San Diego Computer Science & Engineering** PI: Christine Alvarado. Studied effects of early undergraduate CS research program on students' identity as researchers and computer scientists. Used thematic analysis methods on open-ended survey data, as well as Python for preprocessing, analysis, and interrater reliability calculation.
October 2020 - June 2021	**Qualcomm Institute @ UC San Diego** PI: Leanne Chukoskie. Survey project about student experiences with engagement in online learning at UCSD during COVID. Co-first-author of paper published in Frontiers in Education, analyzed & visualized data in R, wrote paper Results section

Teaching experience

Fall 2022, Winter 2023, Fall 2023, Winter 2024	**Teaching assistant, DSC 180A/B: Data Science Project.** *Professor: Suraj Rampure.* Supervised undergraduate senior capstone projects, met with project groups, graded assignments, advised on course content, coordinated with academic and industry mentors.
Spring 2023, Spring 2024	**Teaching assistant, DSC 80: Practice and Application of Data Science.** *Professors: Tauhidur Rahman & Sam Lau.* Led discussion sections of 80 to 100 students with live coding, held very busy office hours, graded assignments, and wrote and graded portions of exams.

Other experience

June 2020 - June 2022	**Sports Editor, UCSD Guardian** Wrote and edited (mostly) sports articles for UCSD's campus newspaper, created a 71-minute documentary about UCSD's early campus history that received second place at the San Diego Press Club awards. My work is available here.
Summer 2020	**Percolata, Software Engineering and Machine Learning Intern** Software and timeseries machine learning experimentation for product for automating day trading strategies in Google Cloud Platform. Worked with Python, GCP, timeseries estimation methods & deep learning frameworks.

Projects

September 2021 - March 2022	**Patterns of Fairness in Machine Learning** Along with Anne Xu and Daniel Tong, an user-extensible empirical analysis of ML fairness using various combinations of models, metrics, and datasets. Project repository available here.
Spring 2023	**Logistic Regression Penalizing Demographic Disparities** Final project for CSE 203B: Convex Optimization. Built on Bechavod and Ligett (2018) to develop fairness penalizers for logistic regression; derived dual formulation and solved with CVXPY. Project report available here.

Honors

2023	**NextProf Pathfinder Workshop** Conference for early graduate students interested in faculty and academic careers. Administered by University of Michigan, Georgia Tech, UC San Diego.

Technical skills

Programming languages
Primarily use Python and R, have worked with Java, Go, MATLAB, HTML/CSS, Javascript.

Software
LaTeX, Git, Docker/Kubernetes, DeepLabCut, AWS, Google Cloud Platform, Slurm.