BRADLEY RAVA

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EMPLOYMENT

University of Sydney Business School · Business Analytics *Sydney, Australia*
Lecturer (Assistant Professor) *Aug 2022 - Present*

EDUCATION

University of Southern California - Marshall School of Business *Los Angeles, CA*
Ph.D. Statistics *Aug 2017 - May 2022*
NSF Graduate Research Fellowship in Mathematical Statistics
Thesis: Communicating uncertainty in the implementation and creation of fair machine learning algorithms.
Advisors: Dr. Gareth James and Dr. Xin Tong

University of Southern California *Los Angeles, CA*
B.S. Applied and Computational Mathematics *Aug 2013 - May 2016*

Non-degree seeking programs

Yale University - Department of Statistics and Data Science *New Haven, CT*
Emerging Scholars Initiative Research Fellow *Jul 2016 - May 2017*

London School of Economics and Political Science *London, UK*
General Course · Department of Mathematics *Sep 2014 - Jun 2015*
Year long study abroad program with a full course load and examinations.

Santa Monica City College *Santa Monica, US*
Scholars Program · Mathematics *Jun 2012 - May 2013*

RESEARCH

Journal Articles

"Irrational Exuberance: Correcting Bias in Probability Estimates" (2021)
Authors: G. M. James, P. Radchenko, **B. Rava**
To appear in the *Journal of the American Statistical Association (JASA)*
Software package *"ecap"* available on CRAN and PyPi (downloaded over 6,000 times)

"Asymmetric error control under imperfect supervision: a label-noise-adjusted NP umbrella algorithm" (2021)
Authors: S. Yao, **B. Rava**, X. Tong, and G. M. James
To appear in the *Journal of the American Statistical Association (JASA)*

"A Burden Shared is a Burden Halved: A Fairness-Adjusted Approach to Classification" (2021)
Authors: **B. Rava**, W. Sun, G. M. James and X. Tong
Software package *"fasi"* available on CRAN (New release)

AWARDS

NSF Travel Grant *July 2022*
Amount: $1,000
Transportation and lodging costs awarded to attend and present at the 2022 Quality and Productivity Research Conference.

USC Marshall Fellowship *Sep 2021*
Amount: $10,000
Awarded to the top 3 Ph.D. students at USC Marshall based on the quality of their dissertation proposal, their CV, and research progress to date.

USC Global Branding Fellowship *Jun 2020*
Amount: $1,000
Competitive fellowship awarded on the basis of a students dissertation proposal, their CV, working papers, and research progress to date.

NSF 2026 Idea Machine Competition *Mar 2019*
Top 100 (out of 800) submissions.
Competitive competition to submit pressing "grand challenges" in fundamental research or STEM education that have the potential for great impact.
Proposal: Navigating the Human AI Interface – "How will humanity's intellectual habitat evolve with the maturation of artificial intelligence (AI)?"

Correlation-One / Citadel Southern California Datathon – First Place *Nov 2017*
Amount: $20,000
Project identified neighborhoods in NYC that needed more access to public transportation by studying how the introduction of Uber impacted travel. We measured the benefits of investing in more transportation for a specific neighborhood by constructing a metric that quantified the excess demand growth in transportation usage as a result of the introduction of Uber.

National Science Foundation Graduate Research Fellowship *Aug 2017 - May 2022*
Awarded in the field of Mathematical Statistics
Supports outstanding graduate students in NSF-supported STEM disciplines pursuing doctoral degrees. The five-year fellowship includes three years of financial support. A $34,000 stipend and a $12,000 cost of education allowance paid to the institution.

Yale Emerging Scholars Initiative Research Fellowship *Aug 2017 - May 2017*
Awarded full tuition coverage, a stipend of $32,000, and housing at Yale University to study in the department of Statistics and Data Science.

USC Award for Outreach in Mathematics *May 2016*
Amount: $1,000
Senior mathematics major award given for founding the USC Math Club, leading the USC Applied Statistics Club, and for founding the undergraduate math mentorship program.

TALKS / CONFERENCES

INFORMS 2022 (Invited Session) *Oct 2022*
Session: Statistical Machine Learning for Econometrics and Business Analytics
Paper Presenting: "A Burden Shared is a Burden Halved: A Fairness-Adjusted Approach to Classification"

Quality and Productivity Research Conference (QPRC 2022) *June 2022*
NSF Travel Grant Award
Paper Presented: "A Burden Shared is a Burden Halved: A Fairness-Adjusted Approach to Classification"

EcoSta 2022 (Invited Session) *June 2022*
Session: Advances in statistical learning theory and large-scale inference
Paper Presented: "A Burden Shared is a Burden Halved: A Fairness-Adjusted Approach to Classification"

Kansas University Business School *Apr 2022*
Guest lecture on Fairness in Machine Learning

Selective Inference Seminar *Feb 2022*
Paper Presented: "A Burden Shared is a Burden Halved: A Fairness-Adjusted Approach to Classification"

University of Sydney Business School *Feb 2022*
Guest lecture on Fairness in Machine Learning

Informs 2021 (Invited Session) *Oct 2021*
Session: Robust Learning Methods for Econometrics and Business Analytics
Paper Presented: "Irrational Exuberance: Correcting Bias in Probability Estimates"

Joint Statistical Meetings 2021 (Invited Session) *Aug 2021*
Session: Application of Asymmetric Classification and Multiple Testing
Paper Presented: "Asymmetric error control under imperfect supervision: a label-noise-adjusted NP umbrella algorithm"

Joint Statistical Meetings 2020 *Aug 2020*
Session: Causal Inference, Empirical Bayes and Related Topics in Regression
Paper Presented: "Irrational Exuberance: Correcting Bias in Probability Estimates"

Google PhD Intern Research Conference (PIRC) *Jul 2020*
Lightning talk for industry data scientists.
Presented: "Why might your probability estimates be biased?"

Google Statistics Journal Club *Jun 2020*
Paper Presented: "Irrational Exuberance: Correcting Bias in Probability Estimates"

ENAR 2019 Spring Meeting (Invited Session) *Mar 2019*
Session: Classification and Variable Selection Under Asymmetric Loss
Paper Presented: "Asymmetric error control under imperfect supervision: a label-noise-adjusted NP umbrella algorithm"

INDUSTRY EXPERIENCE

Google · Google Maps *Mountain View, CA*
Product Analyst Intern *May 2020 - Aug 2020*

- Designed and implemented an empirical bayes method to refine Google Map's internal ML algorithm for determining if a business was operational/shut down. This helped decision makers understand their models uncertainty, specifically in countries not included in the training data set.
- Determined how business information stores gave Google Maps causally changed the user activity they received. This framework was generalized and produced easy to understand uncertainty estimates to management.
- Researched how Google's uncertainty estimates might unfairly be impacting small businesses and countries Google had little information on. Proposed adjustments to their probability calibration procedure to address potential fairness issues before they came up.

Symantec · Cyber Insurance Group (Currently Cyber Cube) *San Francisco, CA*
PhD Research Intern *Jun 2017 - Aug 2017*

- Developed a framework to estimate the probability of a cyber-criminal targeting a given company using a random walk. This was used to help price insurance policies for cyber attacks.
- Created a classification model to predict a companies industry type from the text on their home page for data imputation.
- Designed an expert survey in order to best incorporate industry knowledge into the product.

Summit Consulting, LLC *Washington, DC*
Summer Analyst *Jun 2015 - Aug 2015*

- Performed econometric research and analysis for a high-profile litigation project dealing with asset backed securities.
- Analyzed large data sets for the government in order to evaluate the effectiveness of their programs and rate of workplace injury.

– Collaborated with the executive team and senior consultants to integrate Topological Data Analysis into existing projects.

Swoon Editions *London, UK*
General Analyst *Nov 2014 - Dec 2014*

– Advocated for and implemented a system for attributing physical advertising to new sales, leading to significant improvements in the distribution of marketing budgets.
– Researched, analyzed, and quantified shipping sensitivities of customers to optimize fulfillment processes.

TEACHING EXPERIENCE

BUAD 425: Data Analysis for Decision Making
Course Lecturer *Jan 2021 - May 2021*
Teaching Assistant *Aug 2020 - Dec 2020*
Undergraduate Senior Capstone Course
Goal of the course is to provide students entering managerial positions with data science tools. A specific emphasis is placed on identifying new opportunities to use data science and thinking across multiple disciplines to solve problems. Topics included AB testing, KPI's and dashboarding, classification, clustering, and fairness in ML.
Created asynchronous Youtube videos (Watched over 1,500 times).

GSBA 524: Data Science for Business *Aug 2020 - Dec 2020*
Teaching Assistant
MBA Course
Principles of probability theory and classical statistics applied to business decision problems; survey analysis, estimation and prediction methods, evaluation, and control techniques.
Created and gave a lecture on Fairness in Machine Learning.

CLUBS, AFFILIATIONS AND INTERESTS

– President of USC Applied Statistics Club (2015-2016) and the USC Math Club (2015-2016)
– Founder and President of LSE Applicable Mathematics Society (2014-2015)
– USC Triathlon Club Merch Chair (2020-2022), former Treasurer (2017-2018) and Alumni Director (2016-2017)
– Otillo Catalina World Series, ironMan 104.6 Nice France, San Francisco Marathon, ironMan 70.3 Santa Rosa