

# BRADLEY RAVA

Abercrombie Building H70, Corner Abercrombie Street and, Codrington St, Darlington NSW 2006, Australia

Email: [bradley.rava@sydney.edu.au](mailto:bradley.rava@sydney.edu.au) ♦ Website: [bradrava.com](http://bradrava.com) ♦ Video Lectures: [Youtube](#)

## EMPLOYMENT

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**University of Sydney Business School · Business Analytics**

Lecturer (Assistant Professor)

*Sydney, Australia*

*Aug 2022 - Present*

## EDUCATION

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**University of Southern California - Marshall School of Business**

Ph.D. Statistics

*Los Angeles, CA*

*Aug 2017 - May 2022*

NSF Graduate Research Fellowship in Mathematical Statistics

**Thesis:** Adapting Statistical Learning for High Risk Scenarios.

**Advisors:** [Dr. Gareth James](#) and [Dr. Xin Tong](#)

**University of Southern California**

B.S. Applied and Computational Mathematics

*Los Angeles, CA*

*Aug 2013 - May 2016*

### Non-degree seeking programs

**Yale University - Department of Statistics and Data Science**

Emerging Scholars Initiative Research Fellow

*New Haven, CT*

*Jul 2016 - May 2017*

**London School of Economics and Political Science**

General Course · Department of Mathematics

*London, UK*

*Sep 2014 - Jun 2015*

Year long study abroad program with a full course load and examinations.

**Santa Monica City College**

Scholars Program · Mathematics

*Santa Monica, US*

*Jun 2012 - May 2013*

## RESEARCH

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### 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

## AWARDS

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**Sydney University Early Career Research Grant**

Amount: \$14,000 AUD

Early career research grant to support research in Fairness in Machine Learning.

*Jan 2023*

**NSF Travel Grant**

Amount: \$1,000

*July 2022*

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**

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**CMStatistics (Invited Session)**

*Dec 2022*

Session: Inference under heterogeneity

Paper Presenting: “A Burden Shared is a Burden Halved: A Fairness-Adjusted Approach to Classification”

**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)**

*Jun 2022*

NSF Travel Grant Award

Paper Presented: “A Burden Shared is a Burden Halved: A Fairness-Adjusted Approach to Classification”

**EcoSta 2022 (Invited Session)**

*Jun 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

**Informa 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**

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**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

Summer Analyst

Washington, DC

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

General Analyst

London, UK

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

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### BUSS 4934: Advanced Applications in Business Analytics

Course Lecturer

Jul 2023 - Nov 2023

A new advanced honors level undergraduate course that focuses on fairness in machine learning with applications in business.

### QBUS 6810: Statistical Learning and Data Mining

Course Lecturer

Feb 2023 - Nov 2023

This unit offers an insight into the main statistical methodologies for the visualization and the analysis of business and market data. It provides the tools necessary to extract information required for specific tasks such as credit scoring, prediction and classification, market segmentation and product positioning. Emphasis is given to business applications of data mining using modern software tools.

### 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

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- 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