

MAC STRELIOFF

619-699-9845

macstrelloff@gmail.com

/in/macstrelloff/

/MacStrelloff

macstrelloff.github.io/MacStrelloff/

EXPERIENCE

Statistical Consulting and Internships

Data Science Fellow at Insight Data Science

June 2019 – present San Francisco, CA

- Identified users that could benefit from intervention, and free-trial users who acted like potential paying users, based on classification algorithms.
- Suggested product features to focus on when onboarding new users, based on feature importance from the **gradient boosting decision trees (GBT)** algorithm.
- Evaluated performance of **discriminant analysis, support vector classification, and tree-based algorithms** using **F1, AUC, precision, recall, and accuracy** metrics.
- Achieved ~81% mean AUC with **gradient boosting decision trees (GBT)**.

Visiting Research Assistant at U.S. Army Research Laboratory West

June 2018 - Sept 2018 Playa Vista, CA

- Programmed **dynamic Bayesian logistic regressions with model averaging** to predict behavioral task performance from brain data in near-real time. Achieved accuracy comparable to standard offline **machine learning models**.
- Validated, through parameter recovery simulations, an implementation of **Bayesian Sparse Reduced Rank Regression** using **R and Stan**.

Statistical Consultant for UCI Engineering, Sciences, and Technology Programs

Sept 2017 - Dec 2017 Irvine, CA

- Found higher total percentage points (tpp) earned by students in a course with pre-recorded lectures compared to an offering without such recordings, and a higher benefit for non-native English speakers (+6.81 tpp, 95%CI: 4.38, 9.25) compared to native English speakers (+1.48 tpp, 95%CI: 0.14, 2.83).
- Identified and communicated limitations with the study design.

Research Projects at University of California

Price Anomalies in Prediction Markets

Aug 2014 – May 2019 Irvine, CA

- Initiated a collaboration with a large online prediction market servicer, this granted access to all trade-level data in over 1500 markets (5.21GB).
- Acquired additional data through **web scraping** and **API requests**.
- Discovered arbitrage opportunities for ~1-5% guaranteed profits by investigating prices in markets related by **probability theory** (e.g. markets for events that were a subset of events in another market).
- Assessed the relationship between price and empirical event probabilities using **Bayesian inference with a custom model**, which revealed a premium of ~100% on low probability events and a discount of ~10% on high probability events.

Reinforcement Learning and Decision Making

Aug 2014 – May 2019 Irvine, CA

- **Designed contextual bandit experiments** to study the impact of emotionally charged cues on preferences for risky and impulsive behavior.
- Inferred people's strategies based on their choices during a bandit task, using **Bayesian inference** and a **latent mixture of cognitive models**.
- Specified theories of human behavior as **reinforcement learning algorithms**.
- **Designed experiments**, based on simulations where the algorithms predicted different behavior, to find which algorithm was consistent with human behavior.

SKILLS OVERVIEW

Programming

R, Python, MATLAB, SQL, Git, Bash

Methods

Experimental Design

Hypothesis Testing

Statistical Inference

Probability Theory

Bayesian Statistics

Reinforcement Learning

Contextual Bandits

Causal Inference

PROJECTS

YouTube Lessons & Tutorials

Taught statistics and recorded my lessons and tutorials. My recordings have over 9,000 views on YouTube.

Tweet Frequency Modeling

Developed a model of tweet frequency using conjugacy and Poisson processes.

Algorithmic Trading

Analyzed stock prices and backtested trading algorithms through Quantopian. Evaluated algorithms using Sharpe ratios and returns relative to the S&P 500.

Rock, Paper, Scissors AI

Devised and deployed an AI agent that dynamically identifies patterns in user behavior to win rock, paper, scissors games.

Student's Tea Co-Leader

Facilitated a weekly tea-time between alumni and current students in statistics.

EDUCATION

Ph.D. Cognitive Sciences

University of California, Irvine, 2019

M.S. Statistics

University of California, Irvine, 2018

B.S. Psychology, Math Emphasis

University of California, Davis, 2014