

ERIN H. BUGBEE

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RESEARCH INTERESTS

- Computational cognitive models of decision making, decisions from experience, models of behavioral game theory
- Computational social science, social networks, wisdom of the crowds, data science for social sciences
- Human and machine learning, reinforcement learning, artificial intelligence

EDUCATION

Carnegie Mellon University

Ph.D., Behavioral Decision Research, Department of Social and Decision Sciences
Advisors: Russell Golman and Cleotilde Gonzalez

Pittsburgh, PA

2020 - Current

Brown University

Sc.B., Statistics with Honors

A.B., Behavioral Decision Sciences, Specialization in Human and Machine Learning

Thesis: Understanding Human and Artificial Decision Makers Using Reinforcement Learning

Overall GPA: 3.97/4.0, Magna Cum Laude

Providence, RI

May 2020

PUBLICATIONS

Savard, C., **Bugbee, E.H.**, McGuirl, M.R., and Kinnaird, K.M., (2020). SuPP and MaPP: Adaptable Structure-Based Representations for MIR Tasks. *Proceedings of 21st International Society for Music Information Retrieval Conference*. Montreal, Canada.

Abstract: We build off of the SE and SNL diagrams and introduce SuPP and MaPP, which are more suitable for machine learning algorithms and can be generalized for use in several MIR tasks.

McGuirl, M.R., Kinnaird, K.M., Savard, C., & **Bugbee, E.H.** (2018). SE and SNL Diagrams: Flexible Data Structures for MIR. *Proceedings of 19th International Society for Music Information Retrieval Conference*. Paris, France.

Abstract: We introduce two matrix-based data structures for music information retrieval as inspired by topological data analysis and demonstrate their success in the cover song task.

WORKING PAPERS

Golman, R., **Bugbee, E.H.**, Jain, A., Saraf, S., (Submitted R&R at Psychological Review). "Hipsters and the Cool: A Game Theoretic Analysis of Social Identity, Trends and Fads."

Abstract: We propose a theory of social identity expression based on the opposing motives to conform and to be unique among one's neighbors in a social network, and model the resulting social dynamics.

Tatlidil, S., **Bugbee, E.H.**, Dick, M., Hemmatian, B., Sloman, S., "Algorithms as Advisors in the Future of the Workplace."

Abstract: In three experiments, we study how likely people are to take advice from an algorithm compared to a human coworker for workplace decisions. We find that participants' agreement with the advisor predicts their trust of the advisor, and that people trust the human more than the algorithm, though they do not always follow the advice of the humans.

Deceiving from experience. Work with Cleotilde Gonzalez and Palvi Aggarwal.

Abstract: We use a simple game, the box game, to study how a human player learns from experience to execute a task while relying on feedback and deceptive or truthful signal. We compare human performance to a cognitive model based on Instance-Based Learning Theory and demonstrate that the model predicts the results from the laboratory experiment.

WORK IN PROGRESS

The Science of Understanding. Work with Cleotilde Gonzalez and Leslie Blaha.

Abstract: We aim to develop a cognitive model based on Instance-Based Learning Theory that can predict human behavior across various sequential choice tasks involving risk.

Biases from experience. Work with Cleotilde Gonzalez.

Abstract: We review the literature on experiential biases, or biases learned from experience, and propose a measure of deviation from optimal decisions based on Bayesian updating.

GRANTS AND FELLOWSHIPS

Presidential Fellowship, Dietrich College of Humanities and Social Sciences, Carnegie Mellon University

PRE-DOCTORAL RESEARCH EXPERIENCE

Sloman Lab Research Assistant

PI: Steven Sloman

The Future of Work: Experimental design, implementation, and data analysis to study human trust in machines for human and machine advisors across domains to anticipate and understand the future of work. *Tools: Qualtrics, Prolific, R*

Brown University

Fall 2019 – Summer 2020

Honors Senior Thesis

Advisor: Lorin Crawford

Brown University

Fall 2019 – May 2020

Honors Thesis in Statistics, using reinforcement learning to inform how different agent personalities learn in various contexts to understand the paradox of choice. *Languages: Python, MATLAB*

Learning, Memory & Decision Lab Research Assistant

Brown University

Advisor: Matthew Nassar

Spring 2019 – May 2020

Studying reinforcement learning in dynamic environments to understand place field remapping in the hippocampus. Past work involved reinforcement learning for multi-armed bandits. Carney Institute for Brain Science. *Languages: MATLAB*

Collaborative Research on Music Information Retrieval

Brown University

Advisor: Katherine Kinnaird

Summer 2017 – Present

Ongoing research applying techniques from machine learning and topological data analysis to music information retrieval tasks. *Languages: MATLAB, Python*

Summer@ICERM: Topological Data Analysis

ICERM

Advisor: Katherine Kinnaird and Jeffrey Brock

Summer 2017

Participated in Undergraduate Research Program in Topological Data Analysis affiliated with Brown Data Science Initiative. Developed an efficient and accurate method for detecting cover songs. *Languages: MATLAB*

HONORS AND AWARDS

Brown University

May 2020

Premium for Excellence in Behavioral Decision Sciences.
Statistics Undergraduate Poster Award Winner.

Brown Data Science Fellow

Spring 2020

Fellow in the first cohort of Data Science Fellows through the Harriet W. Sheridan Center for Teaching and Learning and the Brown Data Science Initiative.

Brown Department of Computer Science Undergraduate TAs

2019

Awarded Bob Petrocelli Head Undergraduate TAs for Fall 2019.
Awarded Class of '81 Undergraduate TAs for Women in CS for Spring 2019.

Disney Data & Analytics Women Scholarship Recipient

August 2018

Scholarship to attend Disney Data & Analytics Conference in Orlando, FL.

Outstanding Poster Award, Joint Mathematics Meetings

January 2018

For “Comparing Songs Using Matrix Pattern Preservation” in San Diego, CA.

WORK EXPERIENCE

Sales Analytics & Insights Intern

Orlando, FL

The Walt Disney Company

Summer 2019

Analytics for the Disney Cruise Line, predicting Disneyland Anaheim attendance by determining leading indicators for international markets using regression analysis, analyzed flight data for John Wayne Airport.

Explore Microsoft Intern

Microsoft

Redmond, WA

Summer 2018

Program Manager and Software Engineer for Microsoft Support Engineering Group, Universal Store Team, Cloud + AI division.

TEACHING EXPERIENCE

CARNEGIE MELLON UNIVERSITY

Thinking in Person vs. Thinking Online

Fall 2020

Department of Social and Decision Sciences, Professor: Danny Oppenheimer

BROWN UNIVERSITY

NEUR 1660: Neural Computations Underlying Learning and Decision Making

Spring 2020

Department of Neuroscience, Professor: Matthew Nassar

CSCI 0100: Data Fluency for All

Fall 2019

Department of Computer Science, Professor: Amy Greenwald

CSCI 1951a: Data Science

Spring 2019

Department of Computer Science, Professor: Ellie Pavlick

CLPS 0220: Making Decisions

Spring 2019

Department of Cognitive, Linguistic, and Psychological Sciences, Professor: Steven Sloman

APMA 1655: Advanced Statistical Inference I

Fall 2018

Department of Applied Mathematics, Professor: Caroline Klivans

PHP 1501: Essentials of Data Analysis

Fall 2018

Department of Biostatistics, Professor: Roe Gutman

CSCI 0100: Data Fluency for All

Fall 2017

Department of Computer Science, Professor: Amy Greenwald

RESEARCH PRESENTATIONS

TALKS

“Reinforcement Learning in Dynamic Environments for Place Cell Remapping”

Learning, Memory & Decision Lab
Brown University, November 11, 2019

“Comparing Songs Without Listening”

Brown Math Slam, Society for Industrial and Applied Mathematics/AWM
Brown University, November 8, 2018

“SE and SNL Diagrams: Flexible Data Structures for MIR”

The International Society for Music Information Retrieval Conference (ISMIR)
Paris, France, September 23-27, 2018

POSTER PRESENTATIONS

“Algorithms as Advisors in the Future of the Workplace”

Society for Judgment and Decision Making Conference
Remote, December 9-12, 2020

“SuPP and MaPP: Novel MIR Data Structures Inspired by Topological Data Analysis”

The International Society for Music Information Retrieval Conference (ISMIR)
Paris, France, September 23-27, 2018

“Comparing Songs Using Matrix Pattern Preservation”

Joint Mathematics Meetings
San Diego, CA, January 12, 2018

“Comparing Songs Using Matrix Pattern Preservation”

NEMISIG (Northeast Music Informatics Special Interest Group)
Brown University, January 27, 2018

“Comparing Songs Using Matrix Pattern Preservation”

Women in Data Science Conference
Worcester Polytechnic Institute, March 5, 2018

WORKSHOPS

“Introduction to R Programming”

Brown Datathon
Brown University, March 3, 2018

LEADERSHIP AND SERVICE

Brown Data Science Club

President, 2019 – 2020
Marketing Team Leader, 2018 – 2019
Outreach Team Member, 2017 – 2019
Club Member, 2016 – 2017

Diversity & Inclusion Committee, Department of Biostatistics and Center for Statistical Sciences
Undergraduate Representative, 2018 – 2020

Statistics Departmental Undergraduate Group (DUG)
DUG Leader, Brown University, 2018 – 2020

Women in Machine Learning Workshop
Reviewer, 2019

CONFERENCES AND TRAVEL AWARDS

Society of Judgment and Decision Making Conference
The Society of Judgment and Decision Making, Remote, December 9-12, 2020

ISMIR 2020
International Society for Music Information Retrieval, Montreal, Canada, October 11-15, 2020
Travel funded by ISMIR Student Travel Grant

ASA Women in Statistics and Data Science 2020
The American Statistical Association, Remote, September 30-October 2, 2020
Funded by ASA WSDS Student Travel Award

ASA Women in Statistics and Data Science 2019
The American Statistical Association, Bellevue, WA, October 2-5, 2019
Travel funded by ASA WSDS Student Travel Award and Brown Data Science Initiative

Disney Data & Analytics Conference (DDAC) 2019
The Walt Disney Company, Orlando, FL, August 20-22, 2019

Statistics and Data Science Conference (SDSCon)
MIT Media Lab, Cambridge, MA, April 5, 2019

News vs. Truth Seminar with Former President of CNN Jon Klein and Steven Sloman
Brown University, Providence, RI, Spring 2019

Collaborate@ICERM 2019: Topological Data Analysis and Music Information Retrieval
ICERM, Providence, RI, January 7-11, 2019
Travel funded by ICERM

Machine Intelligence Conference
MIT Media Lab, Cambridge, MA, November 3, 2018

ISMIR 2018
International Society for Music Information Retrieval, Paris, France, September 23-27, 2018
Travel funded by ISMIR Student Travel Grant and the Brown Data Science Initiative

Disney Data & Analytics Conference (DDAC) 2018

The Walt Disney Company, Orlando, FL, August 28-29, 2018

*Travel Funded by the **Disney Data & Analytics Women Scholarship***

Women in Data Science (WiDS) 2018

Worcester Polytechnic Institute, Worcester, MA, March 5, 2018

Northeast Music Information Special Interest Group (NEMISIG) 2018

Brown University and Spotify, Providence, RI, January 27, 2018

Joint Mathematics Meetings 2018

The American Mathematical Society and the Mathematical Association of America, San Diego, CA, January 10-13, 2018

*Travel Funded by **JMM Student Travel Grant** and ICERM*

PROFESSIONAL AFFILIATIONS

Society for Judgment and Decision Making, *Student Member*, 2020 – Present

Cognitive Science Society, *Student Member*, 2020 – Present

American Statistical Association, *Student Member*, 2018 – Present

COMPUTER SKILLS

Programming: R, Python, MATLAB, SQL, Java, Stata, Javascript, HTML, CSS

Miscellaneous: Git, LaTeX, Qualtrics, Prolific, R Markdown, Jupyter Notebooks