

# Lizzie Kumar

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## EDUCATION

<b>Brown University</b> Ph.D. Computer Science Advised by Suresh Venkatasubramanian	expected 2023 <i>Providence, RI</i>
<b>University of Massachusetts</b> M.S. Computer Science, 3.8/4.0	2019 <i>Amherst, MA</i>
<b>Scripps College</b> B.A. Mathematics (honors), 10.8/12.0	2016 <i>Claremont, CA</i>

## RESEARCH EXPERIENCE

<b>Graduate Research Assistant</b> <i>Brown University</i>	Fall 2021- <i>Providence, RI</i>
· Research on how to guide the regulation of machine learning in finance and beyond	
<b>Machine Learning Research Fellow</b> <i>Arthur AI</i>	Summer 2021 <i>Remote</i>
· Studied the utility of machine learning fairness detection and mitigation methods for compliance and regulation in finance; paper(s) forthcoming	
<b>Graduate Research Assistant</b> <i>University of Utah</i>	Fall 2019 - Spring 2021 <i>Salt Lake City, UT</i>
· Researched the effectiveness of methods to understand and explain machine learning models from both a technical and social science perspective; work resulted in 3 conference papers	

## PUBLICATIONS

Shapley Residuals: Quantifying the limits of the Shapley value for explanations.

**I. Elizabeth Kumar**, Carlos Scheidegger, Suresh Venkatasubramanian, and Sorelle Friedler. In *Advances in Neural Information Processing Systems 34 (NeurIPS)*, 2021.

Epistemic values in feature importance methods: Lessons from feminist epistemology.

Leif Hancox-Li\*, **I. Elizabeth Kumar\***. In *Proceedings of the 4th ACM Conference on Fairness, Accountability, and Transparency (FAccT)*, 2021. **Best paper award.**

Problems with Shapley-value-based explanations as feature importance measures.

**I. Elizabeth Kumar**, Suresh Venkatasubramanian, Carlos Scheidegger, and Sorelle Friedler. In *Proceedings of the 37th International Conference on Machine Learning (ICML)*, 2020.

\*Equal contribution

## HONORS & AWARDS

Best Paper, ACM FAccT	2021
Noel de Nevers Memorial Fellowship, ARCS Foundation Utah	2019-2020
Grad Cohort Workshop for Women Travel Grant, CRA-WP	2020
Lind Family Prize in Mathematics, Scripps College	2015, 2016
James E. Scripps Scholarship, Scripps College	2012-2016
Finalist, National Merit Scholarship	2012

## WORKSHOPS AND INVITED SPEAKING

- Ethics roundtable December 2021  
*Algorithmic Fairness through the Lens of Causality and Robustness (AFCR) Workshop*
- The legal construction of black boxes September 2021  
*Privacy Law Scholars Conference, WeRobot*
- Epistemic values in feature importance methods January 2021  
*Trustworthy ML Rising Star Seminar Series*
- Shapley residuals; Interpretability panel July 2020  
*ICML Workshop on Human Interpretability in Machine Learning*
- Problems with Shapley-value-based explanations as feature importance measures June 2020  
*CapitalOne Responsible AI Journal Club*
- Why doing ethical data science makes better science April 2019  
*UMass Data Science Industry Mentorship Course*
- Explaining an underwriting model with additive feature attribution October 2018  
*Five College Stats and Data Science Research Bytes*

## TEACHING EXPERIENCE

- Graduate Teaching Assistant** Fall 2020 - Spring 2021  
*University of Utah* Salt Lake City, UT
- Held office hours, prepared course materials, and gave occasional lectures for undergraduate-level Algorithms
- Led discussions for undergraduate-level Ethics in Data Science
- Undergraduate Teaching Assistant** Fall 2013 - Spring 2016  
*Scripps College* Claremont, CA
- Mentored Scripps students in any math class twice a week at the walk-in tutoring center
- Graded for Precalculus, Calculus I, Differential Equations, and Number Theory
- Privately tutored Real Analysis
- Drawing Instructor** Summer 2014  
*Deerfield Academy* Deerfield, MA
- Planned and led classes in drawing and other art activities for adolescent campers

## INDUSTRY EXPERIENCE

### Junior Data Scientist

Fall 2016 - Spring 2019

*MassMutual*

*Amherst, MA*

- Wrangled/analyzed data and developed machine learning models for the pricing and valuation of disability insurance and pension plans
- Supported codebases for data ingestion and model evaluation using R, Python, and SQL
- Implemented explanation systems for transparency into black-box underwriting models
- Fully funded for graduate coursework at UMass through the Data Science Development Program

## TECHNICAL STRENGTHS

### Programming Languages

R, Python, SQL

### Imaging / Typesetting

LaTeX, Photoshop, Illustrator

## SERVICE & OUTREACH

Reviewer, Workshop on Human Interpretability in Machine Learning

2020

Data Visualization Mentor, Five College Datafest

2018, 2019

Beta reader, O'Reilly Machine Learning with Python Cookbook

2017