# David Bruns-Smith

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## EDUCATION AND EXPERIENCE

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|---|---|
| **Stanford University** | Stanford, CA |
| *Stanford Data Science Postdoctoral Fellow* | *2024 – Present* |
| **University of California, Berkeley** | Berkeley, CA |
| *PhD in Computer Science, Awarded August 9th, 2024* | *2017 – 2024* |
| **Yale University** | New Haven, CT |
| *Bachelor of Science in Electrical Engineering and Computer Science* | *2011 – 2015* |

## RECENT PUBLICATIONS

**David Bruns-Smith**, Oliver Dukes, Avi Feller, and Betsy Ogburn. "Augmented balancing weights as linear regression." Journal of the Royal Statistical Society Series B: Statistical Methodology, qkaf019 **(with discussion)**.

**David Bruns-Smith**, Avi Feller, and Emi Nakamura. "Using Supervised Learning to Estimate Inequality in the Size and Persistence of Income Shocks." FAccT 2023.

**David Bruns-Smith** and Angela Zhou. "Robust Fitted-Q-Evaluation and Iteration under Sequentially Exogenous Unobserved Confounders." arXiv preprint arXiv:2302.00662. At INFORMS 2023.

**David Bruns-Smith**, Alexander D'Amour, Avi Feller, and Steve Yadlowsky. "Tailored Overlap for Learning Under Distribution Shift." NeurIPS 2022 Workshop on Distribution Shifts: Connecting Methods and Applications.

**David Bruns-Smith** and Avi Feller. "Outcome Assumptions and Duality Theory for Balancing Weights." AISTATS 2022.

**David Bruns-Smith**. "Model-free and model-based policy evaluation when causality is uncertain." ICML 2021.

## HIGH PERFORMANCE AND PARALLEL COMPUTING PUBLICATIONS

Tae Jun Ham, **David Bruns-Smith**, Brendan Sweeney, Yejin Lee, Seong Hoon Seo, U. Gyeong Song, Young H. Oh, Krste Asanovic, Jae W. Lee, and Lisa Wu Wills. "Genesis: a hardware acceleration framework for genomic data analysis." ISCA 2020. **IEEE Micro Top Picks and ISCA@50 Retrospective.**

Muthu Baskaran, Thomas Henretty, James Ezick, Richard Lethin, and **David Bruns-Smith**. "Enhancing network visibility and security through tensor analysis." Future Generation Computer Systems 96 (2019): 207-215.

Lisa Wu Willis, **David Bruns-Smith**, Frank A. Nothaft, Qijing Huang, Sagar Karandikar, Johnny Le, Andrew Lin, Howard Mao, Brendan Sweeney, Krste Asanovic, David Patterson, Anthony Joseph. "Fpga accelerated indel realignment in the cloud." HPCA 2019.

Tom Henretty, Muthu Baskaran, James Ezick, **David Bruns-Smith**, and Tyler A. Simon. "A quantitative and qualitative analysis of tensor decompositions on spatiotemporal data." HPEC 2017.

Muthu Baskaran, Tom Henretty, Benoit Pradelle, M. Harper Langston, **David Bruns-Smith**, James Ezick, and Richard Lethin. "Memory-efficient parallel tensor decompositions." HPEC 2017. **Best Paper.**

Muthu Baskaran, M. Harper Langston, Tahina Ramananandro, **David Bruns-Smith**, Tom Henretty, James Ezick, and Richard Lethin. "Accelerated low-rank updates to tensor decompositions." HPEC 2016

**David Bruns-Smith**, Muthu M. Baskaran, James Ezick, Tom Henretty, and Richard Lethin. "Cyber security through multidimensional data decompositions." IEEE CYBERSEC 2016.

## PATENTS

"System and methods for selective expansive recursive tensor analysis," Muthu Baskaran, **David Bruns-Smith**, James Ezick, Richard Lethin. US Patent App. 17/086,772, 2021.

## Community and Service

I have served as a journal referee for:

- JRSS:B
- JASA
- Journal of Causal Inference

I have served on the program committee as a reviewer for:

- AISTATS 2022
- FAccT 2022
- AAAI 2023

I co-organized the workshop:

- MLECON at Neurips 2021

## Invited Talks and Presentations

**Two Stage Machine Learning for NPIV**

- American Causal Inference Conference, May 2025
- Stanford Metrics Lunch, April 2025

**Selection Without Monotonicity**

- Berkeley Econometrics Seminar, November 2023

**Robust Fitted-Q Iteration**:

- INFORMS, October 2023

**Augmented balancing weights as linear regression**:

- Online Causal Inference Seminar, February 2025
- Simons Workshop on Multi-group Fairness and Applications, April 2023
- American Causal Inference Conference, May 2023
- Stanford Data-Driven Decisions Group, May 2023
- Netflix Experimentation Group, July 2023
- Berkeley Political Methodology Workshop, September 2023

## Awards

Our paper "Augmented Balancing Weights as Linear Regression" was selected as a RSS discussion paper.

Outstanding Graduate Student Instructor Award, UC Berkeley 2022.

IEEE Micro Top 2020 for "Genesis: a Hardware Acceleration Framework for Genomic Data Analysis."

Labor Science Fellowship, Berkeley Opportunity Lab, 2019.

EECS Departmental Fellowship, UC Berkeley, 2017.

Best Paper, IEEE HPEC 2017 for "Memory-efficient Parallel Tensor Decompositions."

## Industry Research Experience

**Google DeepMind, Student Researcher**                    May 2023 - May 2024

*with Alex D'Amour*

- Reliable reinforcement learning from human feedback for large language models

**Reservoir Labs**                                                              2015 - 2017

*New York, NY*

- High dimensional statistics with tensor decompositions.
- Applications in network security, gene expression, hospital informatics, natural language processing, and software verification.
- Compiler development for custom computer architectures.