

## Education

- 2021–? **PhD Statistics** *Carnegie Mellon University*. Pittsburgh, PA  
*Advised by Aaditya Ramdas*
- 2019–2020 **MS Machine Learning** GPA: 4.0/4.3  
*Advised by David P. Woodruff, Justin Khim and Pradeep Ravikumar on various projects.*
- 2015–2019 **BS Computer Science** GPA: 3.88/4.0

## Publications

1. Risk-limiting financial audits via weighted sampling without replacement  
S. Shekhar, **Z. Xu**, Z. C. Lipton, P. J. Liang, and A. Ramdas UAI 2023
2. Memory bounds for the experts problem  
V. Srinivas, D. P. Woodruff, **Z. Xu**, and S. Zhou STOC 2022
3. A unified framework for bandit multiple testing  
**Z. Xu**, R. Wang, and A. Ramdas NeurIPS 2021
4. Dynamic algorithms for online multiple testing  
**Z. Xu** and A. Ramdas Math. and Sci. ML 2021
5. Class-weighted classification: Trade-offs and robust approaches  
**Z. Xu**, C. Dan, J. Khim, and P. Ravikumar ICML 2020
6. Strategy and policy learning for non-task-oriented conversational systems  
Z. Yu, **Z. Xu**, A. W. Black, and A. Rudnicky SIGDIAL 2016
7. Chatbot evaluation and database expansion via crowdsourcing  
Z. Yu, **Z. Xu**, A. W. Black, and A. Rudnicky RE-WOCHAT workshop of LREC 2016

## Preprints

8. More powerful multiple testing under dependence via randomization  
**Z. Xu** and A. Ramdas 2023
9. Post-selection inference for e-value based confidence intervals  
**Z. Xu**, R. Wang, and A. Ramdas 2022  
*Runner-up Poster Prize @ MCP 2022*

## Projects

- June **Multiple Testing/Post-selection Inference**, *Carnegie Mellon University*
- 2020–Present I am developing methods for post-selection inference [9] and multiple testing [3, 4, 8]. I am advised by Prof. Aaditya Ramdas.
- Oct. **Real Estate Auditing**, *Carnegie Mellon University*
- 2021–Dec. I am providing statistical help (e.g. data analysis, writing expert reports, etc.) for a lawsuit against Allegheny County concerning their practices for computing the assessed values (and consequently property taxes) of newly purchased homes. This was in collaboration with Barbara Stern, John Silvestri, Esq., and Prof. Aaditya Ramdas. Recent news coverage of the case is linked [here](#).
- 2022

- Jan. **Memory Bounded Experts**, *Carnegie Mellon University*
- 2020-Jan. I proved theoretical bounds on space complexity in the streaming setting for the experts problem. This project  
2021 is in collaboration with Vaidehi Srinivas, Prof. David P. Woodruff and Dr. Samson Zhou. We published our work at STOC 2022 [2].
- Jan. **Robust Classification**, *Carnegie Mellon University*
- 2019-Sep. I worked on theoretical understanding of weighted classification methods, and developing an algorithms robust  
2020 to changes in class weighting. I was advised by Dr. Justin Khim and Prof. Pradeep Ravikumar in this area. Our work was accepted for publication at ICML 2020 [5].
- Jan. 2018 - **Machine Translation**, *Carnegie Mellon University*
- Aug. 2019 I used **PyTorch** to train a neural constituency parser as a data augmentation technique for neural machine translation models. I also used **DyNet** to train neural seq2seq models for translating obfuscated code into human-readable code. I was advised by Prof. Graham Neubig.
- Jan. **Dialog Agents**, *Carnegie Mellon University*
- 2016-Oct. I researched crowdsourcing strategies for gathering dialog data using Amazon Turk. I also contributed to  
2016 building a dialog agent that was the first to use reinforcement learning in a non-task specific setting. I was advised by Prof. Zhou Yu and our work was published at SIGDIAL 2016 [6] and the RE-WOCHAT workshop at LREC 2016 [7].

## Industry

- May-Aug. **Research Intern**, *Microsoft Research*, Redmond, WA
- 2023 Team: *Reinforcement Learning*. Mentor: Paul Mineiro. Active learning for calibrating the risk of black-box machine learning models.
- June-Aug. **Engineering Intern**, *Twitter*, Remote
- 2022 Team: *Experimentation Data Science*. Mentors: Luke Sonnet, Umashanthi Pavalanathan. Manager: Brent Cohn. I analyzed use of SAVI (safe-anytime valid inference) methods for A/B testing.
- May-Aug. **Science Intern**, *CTRL-labs (now part of Facebook Reality Labs)*, New York
- 2018 I developed state-of-the-art LSTM ensemble model that models hand movement from electromyography (EMG) signals in **TensorFlow**.  
Built parser for constructing acyclic graph pipeline for preprocessing real time EMG signals.
- May-Aug. **Software Engineering Intern**, *Bloomberg*, New York
- 2017 I worked on the Message Infrastructure team, where I imported RapidCheck, a Haskell QuickCheck inspired testing framework, into the Bloomberg **C++** environment.
- May-Aug. **Software Engineering Intern**, *PicMonkey*, Seattle
- 2016 I helped build the user interface and photo editing features for the launch of the mobile photo editor app in both **Android** and **iOS**.

## Talks

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|------------|---|---|
| July. 2022 | Valid inference under $S^3$ bias for A/B testing                | <i>Twitter ML Modeling Seminar</i>  |
| Jun. 2022  | Post-selection inference for e-value based confidence intervals | <i>Safe, Anytime-Valid Inference (SAVI) and Game-theoretic Statistics Workshop</i>          |
| Mar. 2022  | Post-selection inference for e-value based confidence intervals | <i>International Seminar on Selective Inference</i>   |
| Nov. 2021  | A unified framework for bandit multiple testing                 | <i>Waterloo Student Conference in Statistics, Actuarial Science and Finance</i>             |
| Sep. 2021  | Dynamic algorithms for online multiple testing                  | <i>Workshop on current and future trends in multiple hypothesis testing (MRC Cambridge)</i> |

## Teaching

*Teaching Assistant*

36-402: Advanced Methods for Data Analysis (Spring 2023)

36-650: Statistical Computing (Fall 2021)

15-251: Great Theoretical Ideas in Computer Science (Fall 2017, Spring 2018, Fall 2018)

15-150: Introduction to Functional Programming (Fall 2016, Spring 2017)

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## Service

- Reviewing AISTATS 2021, Mathematical and Scientific Machine Learning 2022, STOC 2023, Electronic Journal of Statistics, New England Journal of Statistics in Data Science
- 2022–2023 CMU StatML Reading Group (SMLRG) organizer
- 2020 SCS Master's Advisory Committee
- 2020 MLD Master's Admissions Committee