Ziyu (Neil) Xu

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Education

2021–? **PhD Statistics** *Carnegie Mellon University*. Pittsburgh, PA
Advised by Aaditya Ramdas

2019–2020 **MS Machine Learning** GPA: 4.0/4.3

2015–2019 **BS Computer Science** GPA: 3.88/4.0

Industry

June-Aug. 2025 **Two Sigma**, *Quantitative Research Intern*, New York, NY
Research on the systematic macro team.

Feb-May. 2025 **Netflix**, *ML Research Intern*, New York, NY
Team: *Machine Learning Inference Research*. Mentor: Michael Lindon. Manager: Nathan Kallus. Applying multiple testing and e-values to improving the A/B testing engine.

May-Aug. 2023 **Microsoft Research**, *Research Intern*, Redmond, WA
Team: *Reinforcement Learning*. Mentor: Paul Mineiro. I developed an anytime-valid method that uses active learning for calibrating the risk of black-box machine learning models [1].

Mar.-May 2023 **Growthbook**, *Consultant*, Remote
I consulted on a project for implementing safe anytime-valid inference (SAVI) methods into Growthbook's A/B testing engine. Documentation is linked here and the open source implementation is here.

June-Aug. 2022 **Twitter**, *Engineering Intern*, Remote
Team: *Experimentation Data Science*. Mentors: Luke Sonnet, Umashanthi Pavalanathan. Manager: Brent Cohn. I analyzed use of safe-anytime valid inference (SAVI) methods for A/B testing.

May-Aug. 2018 **CTRL-labs**, *Science Intern*, New York
Now part of Facebook Reality Labs. 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. 2017 **Bloomberg**, *Software Engineering Intern*, New York
I worked on the Message Infrastructure team, where I imported RapidCheck, a Haskell QuickCheck inspired testing framework, into the Bloomberg C++ environment.

May-Aug. 2016 **PicMonkey**, *Software Engineering Intern*, Seattle
I helped build the user interface and photo editing features for the launch of the mobile photo editor app.

Languages/Frameworks

Python, Pandas, Numpy *Frequently use*

R, C, Rust, PyTorch *Familiar*

Publications

1. Active, anytime-valid risk controlling prediction sets
Z. Xu, N. Karampatziakis, and P. Mineiro NeurIPS 2024

2. Post-selection inference for e-value based confidence intervals
Z. Xu, R. Wang, and A. Ramdas Electronic Journal of Statistics 2024
Runner-up Poster Prize @ MCP 2022

3. Foundations of testing for finite-sample causal discovery
   T. Yan, **Z. Xu**, and Z. C. Lipton — ICML 2024

4. Online multiple testing with e-values
   Z. Xu and A. Ramdas — AISTATS 2024

5. Risk-limiting financial audits via weighted sampling without replacement
   S. Shekhar, **Z. Xu**, Z. C. Lipton, P. J. Liang, and A. Ramdas — UAI 2023

6. Memory bounds for the experts problem
   V. Srinivas, D. P. Woodruff, **Z. Xu**, and S. Zhou — STOC 2022

7. A unified framework for bandit multiple testing
   Z. Xu, R. Wang, and A. Ramdas — NeurIPS 2021

8. Dynamic algorithms for online multiple testing
   Z. Xu and A. Ramdas — Math. and Sci. ML 2021

9. Class-weighted classification: Trade-offs and robust approaches
   Z. Xu, C. Dan, J. Khim, and P. Ravikumar — ICML 2020

10. Strategy and policy learning for non-task-oriented conversational systems
    Z. Yu, **Z. Xu**, A. W. Black, and A. Rudnicky — SIGDIAL 2016

11. Chatbot evaluation and database expansion via crowdsourcing
    Z. Yu, **Z. Xu**, A. W. Black, and A. Rudnicky — RE-WOCHAT workshop of LREC 2016

Preprints

12. Bringing closure to FDR control: beating the e-Benjamini-Hochberg procedure
    Z. Xu, L. Fischer, and A. Ramdas — 2025

13. Active multiple testing with proxy p-values and e-values
    Z. Xu, C. Wang, L. Wasserman, K. Roeder, and A. Ramdas — 2025

14. An online generalization of the (e-)Benjamini-Hochberg procedure
    L. Fischer, **Z. Xu**, and A. Ramdas — 2024

15. More powerful multiple testing under dependence via randomization
    Z. Xu and A. Ramdas — 2023

Projects

Oct. 2021-Dec. 2022 **Real Estate Auditing**, *Carnegie Mellon University*
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.

Talks

July 2025 **Workshop on Game-theoretic Statistics and Sequential, Anytime-Valid Inference (BIRS)**
Bringing closure to FDR control: a general principle for multiple testing

May 2025 **International Seminar on Selective Inference**
Bringing closure to FDR control with a uniform improvement of the eBH procedure

Apr. 2025 **DeGroot Student Research Workshop (Carnegie Mellon University)**
Active multiple testing with proxy p-values and e-values

Jul. 2022 **Twitter ML Modeling Seminar**
Valid inference under S^3 bias for A/B testing

Jun. 2022 **Safe, Anytime-Valid Inference (SAVI) and Game-theoretic Statistics Workshop**
Post-selection inference for e-value based confidence intervals

Mar. 2022 **International Seminar on Selective Inference**
Post-selection inference for e-value based confidence intervals

Nov. 2021 **Waterloo Student Conference in Statistics, Actuarial Science and Finance**
A unified framework for bandit multiple testing

Sep. 2021 **Workshop on Current and Future Trends in Multiple Hypothesis Testing**
Dynamic algorithms for online multiple testing

Teaching

Teaching Assistant

36–402: Advanced Methods for Data Analysis (Spring 2023, 2024)

36–750: Statistical Computing (Fall 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)

Service

2024–2025 Mentorship Program in Stat&DS organizer + mentor

2022–2023 CMU StatML Reading Group (SMLRG) organizer

2020 SCS Master's Advisory Committee

2020 MLD Master's Admissions Committee

Reviewing

2025 AISTATS, ICML, Statistical Methods in Medical Research, Annals of Statistics, TMLR, JASA

2024 NeurIPS, Biometrika, Statistica Neerlandica

2023 STOC, Electronic Journal of Statistics, New England Journal of Statistics in Data Science

2022 Mathmematical and Scientific Machine Learning

2021 AISTATS