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

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

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

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

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

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

Preprints

7. Post-selection inference for e-value based confidence intervals
   Z. Xu, R. Wang, and A. Ramdas
   2022
   Runner-up Poster Prize @ MCP 2022

Projects

Oct. 2021-Present	**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.	
June 2020-Present	**Multiple Testing/Post-selection Inference**, *Carnegie Mellon University*.	
	I am developing methods for post-selection inference [7] and multiple testing [2, 3]. I am advised by Prof. Aaditya Ramdas.	
Jan. 2020-Jan. 2021	**Memory Bounded Experts**, *Carnegie Mellon University*.	
	I proved theoretical bounds on space complexity in the streaming setting for the experts problem. This project is in collaboration with Vaidehi Srinivas, Prof. David P. Woodruff and Dr. Samson Zhou. We published our work at STOC 2022 [1].	

Jan. 2019-Sep. 2020	**Robust Classification**, *Carnegie Mellon University*. I worked on theoretical understanding of weighted classification methods, and developing an algorithms robust 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 [4].
Jan. 2018 - Aug. 2019	**Machine Translation**, *Carnegie Mellon University*. 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. 2016-Oct. 2016	**Dialog Agents**, *Carnegie Mellon University*. I researched crowdsourcing strategies for gathering dialog data using Amazon Turk. I also contributed to 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 [5] and the RE-WOCHAT workshop at LREC 2016 [6].

Industry

June-Aug. 2022	**Engineering Intern**, *Twitter*, Remote. 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. 2018	**Science Intern**, *CTRL-labs (now part of Facebook Reality Labs)*, New York. 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	**Software Engineering Intern**, *Bloomberg*, 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	**Software Engineering Intern**, *PicMonkey*, Seattle. 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

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

Teaching

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

2020	SCS Master's Advisory Committee	*Advises the Dean of the School of Computer Science on issues relating to the master's student body.*