Zee Fryer

CONTACT

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TL;DR

Mathematician and ML researcher/engineer, with 5 years of postdoctoral academic experience and 3 years of industry ML experience. Jack-of-all-trades, primarily motivated by working on interesting new problems and learning new skills.

KEY SKILLS

Experienced coder and problem solver: Excels at breaking down a problem into solvable components, then learning (or creating!) the tools required to solve them.

Cutting-edge NLP: Recent work includes research in Transformer model compression and exploring the use of prompting techniques with LLMs for counterfactual fairness applications.

Data-first approach: Takes dataset creation and data quality seriously, with experience in synthetic data creation, custom dataset creation, and data annotation.

TECH STACK

Works primarily in Python, with a sprinkling of SQL; has experience in multiple deep learning libraries (Tensorflow, PyTorch, JAX/Flax) as well as other common data science libraries such as numpy, pandas, polars, and scikit-learn.

EXPERIENCE

Data Scientist, Reality Defender
January 2023 to June 2024

- First data hire at Reality Defender; designed and built the company's data infrastructure from scratch, and spearheaded the creation of an efficient 6-person team to meet the company's data needs.
- Ensured that the AI team had the training and benchmark data they needed in a timely manner: from sourcing data, to cleaning it, organising it, and creating custom datasets.
- As team lead, was responsible for hiring, management, and mentoring of the 5 junior employees on the team.

AI Resident, Google
October 2020 to April 2022

- Worked with product teams to develop, implement, and evaluate new algorithms in text-based counterfactual fairness, synthetic dataset creation, and model compression.
- Experience with Large Language Models and with writing training loops from scratch for both GPUs and TPUs.
- First author paper accepted to the Workshop on Online Abuse and Harms at NAACL 2022.
- Contributed code to Google Research's open source repository, implementing a new method of matrix compression for Transformer models.

Visiting Assistant Professor, University of California at Santa Barbara
September 2016 to June 2019

- Research and teaching postdoc, yielding 5 peer-reviewed publications and consistently outstanding teaching evaluations from students.

EPSRC Doctoral Prize Fellow, University of Leeds
September 2014 to September 2016

- Research postdoc, yielding 3 research papers in peer-reviewed journals.

EDUCATION

PhD in Mathematics
University of Manchester, UK; September 2010 to June 2014

BS and MS in Mathematics
University of Nottingham, UK; September 2005 to June 2009

PUBLICATIONS

1. **Z. Fryer**, V. Axelrod, B. Packer, A. Beutel, J. Chen, K. Webster; Flexible text generation for counterfactual fairness probing. *Proceedings of the Sixth Workshop on Online Abuse and Harms (WOAH), NAACL 2022*

By convention, authors on mathematics publications are listed alphabetically by surname.

2. S. Agarwala, **Z. Fryer**; A study in $\mathbb{G}_{\mathbb{R},\geq 0}$: from the geometric case book of Wilson loop diagrams and SYM $N = 4$. *Annals IHP D - Comb., Phys. and their Interactions (2021)*
3. S. Agarwala, **Z. Fryer**, K. Yeats; Combinatorics of the geometry of Wilson loop diagrams II: Grassmann necklaces, dimensions, and denominators. *Canadian Journal of Mathematics (2021)*
4. S. Agarwala, **Z. Fryer**, K. Yeats; Combinatorics of the geometry of Wilson loop diagrams I: equivalence classes via matroids and polytopes. *Canadian Journal of Mathematics (2021)*
5. S. Agarwala, **Z. Fryer**; An algorithm to construct the Le diagram associated to a Grassmann necklace. *Glasg. Math. J. (2019) 1-7*
6. **Z. Fryer**, T. Kanstrup, E. Kirkman, A. Shepler, S. Witherspoon; Color Lie Rings and PBW Deformations of Skew Group Algebras. *J. Algebra 518 (2019), 211-236*
7. **Z. Fryer**, M. Yakimov; Separating Ore sets for Prime Ideals of Quantum Algebras. *Bull. Lond. Math. Soc. 49 (2017), no. 2, 202-215*
8. K. Casteels, **Z. Fryer**; From Grassmann necklaces to Restricted Permtuations and Back Again. *Algebr. Represent. Theory 20 (2017), no. 4, 895-921*
9. **Z. Fryer**; The Prime Spectrum of Quantum SL_3 and the Poisson-prime Spectrum of its Semi-classical Limit. *Trans. London Math. Soc. 4 (2017), no. 1, 1-29*
10. **Z. Fryer**; The q-Division Ring and its Fixed Rings. *J. Algebra 402 (2014), 358-378*