HAORAN(HARRISON) LI

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EDUCATION

Ph.D. in Mathematics, University of Maryland, Expected Graduation Fall 2024 (GPA 4.0/4.0)

B.S. in Mathematics and Applied Mathematics, Sun Yat-sen University, Graduated Jun 2018 (GPA 3.7/4.0)

- Majored in **Software Engineering** from Aug 2013 - Jun 2014 (GPA 3.7/4.0)
- Courses in Computer Science: Objective Oriented Programming, Data Structures, Introduction to Algorithms

SKILLS

- **Programming:** Python, C++, C, Java, MATLAB, Mathematica, MySQL, HTML, R, JavaScript
- **Framework:** Tensorflow, PyTorch, Git

EXPERIENCE

Software Engineer Intern, Wolfram|Alpha College Park, Maryland, Jun 2023 – Aug 2023

- Developed step-by-step functions for solving partial sums and sums of 7 types of series, using Mathematica, Sourcetree and working within the well-established framework and protocol of the Wolfram|Alpha Math team.
- Designed efficient algorithms and appropriate code structures for the step-by-step functions, that not only allow standard inputs, but also incorporate novel instances with desirable outputs.
- Created pull requests, kept improving until got approved by everyone and finally hooked some of these implementations into the Wolfram|Alpha codebase to be available to end users.
- Coordinating and collaborating with internal teams and other interns for feedback and code review.
- Attending team meetings to observe and discuss ongoing projects and progress.

PROJECTS

The Erdős Institute Data Science Bootcamp College Park, Maryland, Sep 2022 – Dec 2022

- Conducted detailed exploratory analysis of 3000,000 orders of 20,000+ Instacart customers.
- Used PCA and KMeans clustering to divide customers into 3 groups based on their shopping preferences.
- Designed XGBoost model on different groups of customers that predicts likelihood of future repurchases of any item with accuracies over 90% with appropriate cut-offs.
- Divided tasks into subtasks for every team member. Communicated with each other timely and effectively.

INMAS Machine Learning Workshop College Park, Maryland, Feb 2023

- Trained a three-layered neural network model over 2,000 TED talks that could label them regarding their content. Achieved around 80% accuracy on the test set.
- Used re, nltk packages to preprocess irregular texts and Word2Vec for text embedding.

Computational Package for Multiple Polylogarithms College Park, Maryland, Jan 2020 – Oct 2022

- Wrote Mathematica package that computes derivatives, symbols, one-forms, variation/monodromy matrices, shuffle/tensor/wedge products, coproducts and cobrackets of corresponding multiple polylogarithms.

Minesweeper Game Guangzhou, China, Mar 2015

- Created user interface with JFrame/MFC in Java/C, and implemented depth-first traversal search of the game map.

PUBLICATION & PREPRINT

- **The Lie coalgebra of multiple polylogarithms**. Zachary Greenberg, Dani Kaufman, Haoran Li, Christian K. Zickert. arxiv.org/abs/2211.08337
- **Hopf algebras of multiple polylogarithms, and holomorphic one-forms**. Zachary Greenberg, Dani Kaufman, Haoran Li, Christian K. Zickert. arxiv.org/abs/2203.11588

AWARDS & HONORS

- Dean's Fellowship, University of Maryland
- Hauptman Summer Fellowship, University of Maryland
- Aziz Osborn Gold Medal in Teaching Excellence, University of Maryland
- Scholarship of Canadian Alumni Association (Hong Kong)
- First Class Scholarships, Sun Yat-sen University