

Yihan Zhou (Joey)

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EDUCATION

The University of Texas at Austin

PhD in Computer Science, supervised by Eric Price

Austin, TX

Sep 2021 – Now

The University of British Columbia (Major Average: 91.1/100)

MS in Computer Science, co-supervised by Mark Schmidt and Nick Harvey

Vancouver, BC

Sep 2018 – Aug 2020

University of Waterloo (Major Average: 90.13/100)

BMath in Computer Science, Joint Major in Combinatorics and Optimization

Waterloo, ON

Jan 2015 – Aug 2018

RESEARCH PROJECTS

Near-Polynomially Competitive Active Logistic Regression

Y. Zhou, E. Price and T. Nguyen. *Under Review*

- We developed an efficient yet simple algorithm for **active linear regression**. We proved that the algorithm has query complexity competitive with the optimal polynomially. This is the first adaptive active logistic regression algorithm with provable query complexity guarantee. Our result can be extended to more general function classes including the **exponential family**.
- First author. Designed the algorithm and proved the query complexity with my supervisor. Coded the algorithm for the experiments in **TensorFlow** and **PyTorch** with my collaborator.

A Competitive Algorithm for Agnostic Active Learning

E. Price and Y. Zhou. *NeurIPS 2023* [[arXiv](#)]

- We developed a polynomial algorithm for **active binary classification** whose query complexity is never worse than a multiplicative log factor of the optimal and showed a matching lower bound in the general **agnostic PAC** learning setting. This is the first known **competitive bound** in the agnostic setting for active learning algorithms
- First author. Designed the algorithm and proved the query complexity bounds with my supervisor.

Analyzing and Improving Greedy 2-Coordinate Updates For Equality-Constrained Optimization via Steepest Descent in the 1-Norm

A. V. Ramesh, A. Mishkin, M. Schmidt, Y. Zhou, J. W. Lavington, J. She. [[arXiv](#)][[GitHub](#)]

- We developed fast **greedy 2-coordinate descent** algorithms for smooth functions with sum and box constraints and derived convergence rate bounds. Our algorithm can be applied to solve the **support vector machine** dual problem.
- Fourth author. Participated in designing and analyzing the algorithm. Helped implemented the algorithm in **Scikit-learn**.

Regret Bounds without Lipschitz Continuity : Online Learning with Relative-Lipschitz Losses

Y. Zhou*, V. S. Portella*, M. Schmidt, N. J. A. Harvey. *NeurIPS 2020* [[arXiv](#)]

- We extended the known regret bounds for two classical online convex optimization algorithms, **Follow-The-Regularized-Leader** and **Mirror Descent**, to the setting where the cost function only satisfies **relative Lipschitz continuity** or **relative strong convexity**. This new theoretical result broadens the application potential of the classical online learning algorithms.
- First Author. Modified the algorithm and proved the regret bound with my collaborator.

Replication of Machine-Learning Analyses to Predict Response to Antidepressant Medications in Patients with Major Depressive Disorder

J. Nunez, T. Nguyen, Y. Zhou et al. *PLOS One* [[Link](#)]

- We re-implemented a previous study's predicative models, including random forests, logistic regression, support vector machine etc, on **clinical effectiveness of certain antidepressants** and externally validate their performance on a new dataset. This is one of the earliest work using machine learning methods to predict efficacy of antidepressants.
- Third author. Designed and implemented the predictive models in **Scikit-learn**.

WORK EXPERIENCE

Web Developer

Jan 2016 – Apr 2016

Qlik

Kanata, ON, Canada

- Built a web app named Pythia to extract data from Google Analytics, New Relic, AWS EC2 and Elastic Search by making REST API calls and stored such data to Mongo Database.
- The app was used internally by the developing team to track performance of our product and improve working efficiency.

Software Developer

Sep 2016 – Dec 2016

NN Life Japan

Tokyo, Japan

- Designed and implemented a daily process in Windows PowerShell to fetch useful data and use them to make predictions on the number of expected telephone calls daily.
- This project automated routine manual tasks, enhancing overall work efficiency.

TEACHING

Graduate Teaching Assistant

Sep 2018 – Apr 2020

The University of British Columbia

- CPSC 340 - Machine Learning and Data Mining
- CPSC 320 - Intermediate Algorithm Design and Analysis
- CPSC 420 - Advanced Algorithm Design and Analysis

Graduate Teaching Assistant

Sep 2024 – Now

The University of Texas at Austin

- CS 327E - Elements of Database
- CS 364 - Principle of Machine Learning II

SKILLS

- **Programming Language:** Python, C++ and C
- **Machine Learning Framework:** Scikit-learn, PyTorch and TensorFlow
- **Database:** MySQL, MongoDB and Neo4j
- **Others:** Algorithm Design and Analysis, Probability and Combinatorics

INTERESTS

- **Generative AI:** Currently taking courses and participating in a project where we aim to design new algorithms to improve the sample efficiency of diffusion models.
- **Large Language Model:** Currently learning LLMs. Interested in applying active learning methods on LLMs to improve sample efficiency.

AWARDS

Graduation Dean's Honours List

2018

University of Waterloo

- Highest Degree Honor

Faculty of Mathematics Senate Scholarship

2016 – 2018

University of Waterloo

University of Waterloo President's Scholarship

2015

University of Waterloo

SERVICES AND ACTIVITIES

- Student volunteer at NeurIPS 2019
- Reviewer for NeurIPS 2022, ICML 2023, NeurIPS 2023, SODA 2024, NeurIPS 2024