Kaiyan Zheng

(She/Her)

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Education

University of Michigan, Ann Arbor **Ann Arbor, Michigan**

Department of Mathematics; Department of Statistics; Department of EECS *Expected Graduation: May 2026*

- *Transferred from The Chinese University of Hong Kong, Shenzhen (Financial Engineering - Quantitative Finance)*
- **Program:** ***Triple major*** in BS Mathematics; BS Statistics; BS Data Science
- **mGPA:** 3.87/4 (University Honors, 2024)
- **Selected Graduate Level Courses:** Statistical Theory, Experimental Design, Optimization, Stochastic Processes

Research Projects

Federated Unlearning with Orthogonal Steepest Descent (FedOSD) **May 2024 – Aug 2024**

Supervised by Prof. Junhua Zhao

- Conducted research at the Laboratory of Energy Internet under *Prof. Junhua Zhao*, focusing on privacy-preserving machine learning and optimization in federated systems.
- We proposed a method to **efficiently remove target client data** while minimizing model utility loss. Designed an unlearning Cross-Entropy loss to improve **gradient ascent convergence** and introduced a **steepest descent direction** to mitigate gradient conflicts, outperforming state-of-the-art unlearning methods in FL scenarios.

Machine Learning Meets Micro-robotics **Oct 2023 – Jul 2024**

With Jiachun Zheng et al. *Review*

- At the Medical Micro-Robotics Laboratory under *Prof. Zhuoran Zhang*, focusing on learning-based planning strategies.
- In a survey on recent microrobotics research in Control, Vision and Planning, I am responsible for the Planning section of the review article, analyzing recent advancements in *reinforcement learning, motion optimization, and adaptive decision-making* for micro-robot **trajectory planning** and environmental interaction.

Publication

Federated Unlearning with Gradient Descent and Conflict Mitigation **AAAI 2025**

Zibin Pan, Zhichao Wang, Chi Li, ***Kaiyan Zheng****, Boqi Wang, Xiaoying Tang, Junhua Zhao* *Paper on arXiv*

Teaching Experience

Undergraduate Student Teaching Fellow **School of Data Science, CUHK(SZ)**

CSC1001: Introduction to Computer Science *Sept 2023 – Dec 2023*

- Designed and graded assignments, led weekly lab sessions, held office hours, for a Python course with 1000+ students.

Academic Mentor & Coordinator **School of Data Science, CUHK(SZ)**

University Freshmen Winter Camp *Feb 2024*

- Taught introductory machine learning to 250+ incoming freshmen. Organized scheduling and lecture materials.

Awards

- CUHK(SZ) Bowen Scholarship (2022–2024)
- CUHK(SZ) Dean's List (2022–2024)
- Second Prize, China Undergraduate Mathematical Contest in Modeling (2023)
- First Prize, China National High School Biology Olympiad (2021)

Skills

- **Programming Languages:** Python · C&C++ · Java · MATLAB · R · SQL · LaTeX
- **Frameworks:** PyTorch · matplotlib · Tensorflow · NumPy · pandas · scikit-learn · CVX · Gurobi · streamlit
- **Hobbies:** *I love art, painting and drawing!* (Go to Artwork Portlio!)