Chonghao Qiu

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University of Pittsburgh | Department of Computer Science | Pittsburgh, PA

Biography

I am currently a second-year master's student in the Department of Computer Science at the University of Pittsburgh, advised by Prof. Xiaowei Jia. Prior to this, I earned my B.S. from the National Taipei University of Technology.
My research interests are in **data mining** and **machine learning**, with a focus on applying **knowledge-based methods** to solve real-world problems that have significant social and ecological impacts.

Education

- **University of Pittsburgh** *Aug 2023 - May 2025*
  Master of Science in Computer Science Pittsburgh, US
  - GPA: 3.79/4.00
  - Adviosr: Prof. Xiaowei Jia and Dr. Runlong Yu
- **National Taipei University of Technology** *Sep 2019 - Jun 2023*
  Bachelor of Science in Electronic Engineering Taipei, Taiwan
  - GPA: 3.91/4.00
  - Adviosrs: Prof. Lih-Jen Kau

Publications

C=Conference

[C.1] Runlong Yu, **Chonghao Qiu**(**first** student author), Robert Ladwig, Paul Hanson, Yiqun Xie, Xiaowei Jia (2024). **Physics-Guided Foundation Model for Scientific Discovery: An Application to Aquatic Science**
AAAI 2025, Artificial Intelligence for Social Impact Track (paper acceptance rate 23.3%)

[C.2] Runlong Yu, **Chonghao Qiu**(**first** student author), Robert Ladwig, Paul Hanson, Yiqun Xie, Yanhua Li, and Xiaowei Jia (2024).
Adaptive Process-Guided Learning: An Application in Predicting Lake DO Concentrations
ICDM 2024 (regular paper acceptance rate 10%, **two must accept** and **one should accept**)

[C.3] Tao Chen, Yongjie Yang, **Chonghao Qiu**, Xiaoran Fan, Xiuzhen Guo, Longfei Shangguan (2024).
Enabling Hands-Free Voice Assistant Activation on Earphones
MobiSys 2024 (acceptance rate 16.3%)

Research Experience

Research Assistant - University of Pittsburgh
Jun 2024 - Present
Advisor: Prof. Xiaowei Jia and Dr. Runlong Yu

- **Physics-Guided Foundation Model for Scientific Discovery: An Application to Aquatic Science** *Feb 2024 - Aug 2024*
  Index Terms: foundation model [code]
  - Research Problem: Existing Physics-guided ML models are limited in addressing complex systems with multiple interacting processes, like the link between water temperature and dissolved oxygen in lakes.
  - Approach: Proposed a Physics-Guided Foundation Model that integrates physics-based and ML models, using **physics-consistent constraints** and **feature interaction**.

- **Adaptive Process-Guided Learning: An Application in Predicting Lake DO Concentrations** *Jan 2024 - Jun 2024*
  Index Terms: physics-guided learning, adaptive learning [code]
  - Research Problem: Machine Learning models often disregard physical laws when predicting lake dissolved oxygen concentrations, and the lack of observational data can further degrade the model's performance.
  - Approach: Developed an unsupervised, physics-based framework that incorporates the natural **oxygen mass** variance patterns and uses **adaptive timesteps** to stabilize data during turbulent flux fluctuations.

Research Assistant - University of Pittsburgh

Aug 2023 - Apr 2024

Advisor: Prof. Longfei Shangguan

- **Enabling Hands-Free Voice Assistant Activation on Earphones** *Aug 2023 - Apr 2024*
  Index Terms: mobile devices.
  - Research Problem: Enable hands-free voice activation on everyday earphones, minimizing accidental triggers from surrounding voices and noise.
  - Approach: Created EarVoice, a **small&low-cost** mobile device that distinguishes the primary user's voice, using a "copy, paste, and adapt" approach for accurate wakeup recognition while preserving privacy.

Research Assistant - National Taipei University of Technology

May 2022 - Feb 2023

Advisor: Prof. Lih-Jen Kau

- **Physiological Monitoring Intelligent Computer Mouse** *May 2022 - Feb 2023*
  Index Terms: embedded system, health. [demo]
  - Research Problem: Provide health monitoring for users who prefer not to wear smart devices by integrating heart rate, body temperature, and blood oxygen tracking into a computer mouse.
  - Approach: Developed a **smart mouse** with PPG, temperature, and humidity sensors, displayed on a desktop APP, and stored historical data to provide health insights.

Professional Experience

- **China United Network Communications Group** *Jul 2021 - Aug 2021*
  Software Engineering Intern Jiaxing, China
  - Composed APIs and performed online unit tests, collaborating with teams to design and maintain the user management system for the security center, optimizing security protocols and improving user experience.
  - Developed and maintained the backend management platform, implementing role-based access control and integrating third-party security tools to enhance system monitoring and resilience.

Skills

- **Tools:** PyTorch, TensorFlow, Linux, AWS, Keil5, SpringBoot, Vue.js, Git
- **Programming Languages:** Python, JavaSE, C, C#, SQL, MATLAB, JavaScript
- **Language:** Chinese(native), English(proficient, TOEFL iBT: 102)
- **Relevant Courses:** Data Mining, AI for Social Good(PhD level), Foundations of AI, NLP, Wide Area Networks, Database System, Software Security & Reverse Engineering, OS, Machine Learning, Signals and Systems, Electromagnetics, Electronics, Engineering Mathematics, Probability, Linear Algebra

Honors & Awards

- Undergraduate Dean's List Award for Fall 2019, Fall 2020, Spring 2021, and Spring 2022 (Top 1%)
- Outstanding Undergraduate Student Award 2023 (Top 1 in class)
- First Place in Graduation Project Exhibition 2023 (Top 1)

Additional Information

- **Volunteer Work:** I am a registered volunteer in Taipei City.
- **Interests:** Music, Electric Guitar, Table Tennis, Fitness.