YIWEI CHEN

Room 10-204, East Main Building, Tsinghua University, Beijing, China 100084
chen-yw20@mails.tsinghua.edu.cn | 86-18964656103 | https://veevang.github.io

EDUCATION

Tsinghua University **09/2020 – Expected 05/2024**
Double Bachelor's Degree in Science and Engineering **Beijing, China**

- Bachelor of Science in **Mathematics and Physics** & Bachelor of Engineering in **Civil Engineering and Systems**.
- Current GPA: **3.85**/4.00 (Freshman year: 3.77, Sophomore year: 3.90, Junior year: 3.94).
- Academic Awards: Tsinghua University Overall Excellence Scholarship (Top 20%, 2022; Top 20%, 2023); Tsinghua University Academic Excellence Scholarship (Top 17%, 2022; Top 17%, 2023).

RESEARCH EXPERIENCE

Federated Learning Contribution Estimation [1] **09/2022 – Present**
Database Laboratory, Tsinghua University **Beijing, China**

- Supervised by Professor Guoliang Li Homepage.
- Key Contributions:
  - An in-depth survey. Examined **29** distinct contribution estimation methods and dissected the problem into three key aspects: data utility metrics, contribution estimation schemes, and optimization techniques.
  - A comprehensive evaluation. Conducted an extensive evaluation of **13** state-of-the-art contribution estimation methods, comparing their effectiveness, robustness, and efficiency, which encompasses 4 datasets, 2 data distributions, and 4 adverse behaviors.
  - An extensive set of observations and findings. Identified the advantages and limitations of different data utility metrics, contribution estimation schemes and optimization techniques across various scenarios, as well as the summarized findings.
  - An extensible testing framework. Developed a flexible testing framework capable of accommodating multiple implemented methods, which serves as a potential benchmark for evaluating performance in this field.

PUBLICATIONS

[1] **Yiwei Chen**, Kaiyu Li, Guoliang Li, and Yong Wang. 2024. Contributions Estimation in Federated Learning: A Comprehensive Experimental Evaluation. *Proceedings of the VLDB Endowment* (2024). Under Revision.

SELECTED PROJECTS

AI for Connect 4 Game Code **01/2023 – 05/2023**
Course Project for *Introduction to Artificial Intelligence* (90/100) **Beijing, China**

- Designed an evaluation function for assessing Connect 4 board positions, and leveraged it to implement an AI based on alpha-beta pruning algorithm for Connect 4 game in C++.

Band Management System Code **01/2022 – 05/2022**
Course Project for *Principle and Application of Database* (A+) **Beijing, China**

- Designed a database for band management using E-R diagram, and implemented a band management system in Python and SQL with a local MySQL server.
- Key Features:
  - Graphical User Interface. Completed a graphical user interface for the system with Tkinter, enabling an easy band management for users.
  - Band Management. Created a user-friendly interface for users to effortlessly create, search and join bands.
  - Song Management. Designed a song management module allowing users to create, search, and delete songs associated with their respective bands.
  - Performance Management. Enabled users to manage their band's performances. This feature not only allowed users to create, search, and delete performances but also facilitated the attachment of song lists.

MIDI-Compatible Keyboard Code **01/2022 – 05/2022**
Course Project for **Beijing, China**
***The Fundamental of Computer: The Hardware/Software Interface* (A)**

- Designed and implemented a MIDI-compatible keyboard instrument with STM32 and STM32CubeIDE in C, allowing users to play and record MIDI notes into the DAW on their computers.
- Influenced the course curriculum. Due to the project's success, the instructor incorporated a mandatory experiment on the MIDI protocol.
- Key Features:
  - High-Accuracy Input. Improved user experience by implementing an jitter reduction algorithm, resulting in a low error rate, albeit using standard course-provided buttons.
  - Diverse MIDI Input Methods. Enhanced flexibility and compatibility by implementing two distinct MIDI signal input methods: a conventional setup alongside a cost-effective alternative approach.

Selected Courses

Tsinghua University **09/2020 – Expected 05/2024**
Double Bachelor's Degree in Science and Engineering **Beijing, China**

- Principle and Application of Database (A+).
- Data Structures and Algorithms (A).
- The Fundamental of Computer: The Hardware/Software Interface (A).
- Introduction to Artificial Intelligence (P, 90/100).
- Calculus A(2) (A).
- Fundamentals of Physics (3) (A).
- Fundamentals of Electronics (A).

Coursera **10/2023 – Present**

- Operating Systems (Peking University, 24 hours)

Professional Skills

- Language: English (Professional Working Proficiency; TOEFL: 103, Writing: 29; CET-6); Chinese (Native).
- Technical Skills: Python (PyTorch, Sklearn, Seaborn), C++ (C), MATLAB, SQL; LaTeX, Drawio (a diagram maker); Git (Github), Overleaf; AutoCAD, Solidworks, Autodesk Inventor.

Extracurricular Activities

- **Team Member.** Baseball Team of Weiyang College. 09/2022 – Present
  - Achieved 7th place in Group A in 2022 Tsinghua Baseball Match as a first baseman.
  - Achieved top 4 of 2023 Tsinghua University Baseball Association's Slow Pitch Softball Match.
- **Band Drummer.** 09/2017 – Present
  - Performed more than **15** times at various live music venues including Dusk Dawn Club and YUYINTANG, with performance locations covering Beijing, Shanghai and Hebei.
  - Participated in the arrangement of some of the released songs of LostExit band.
- **Class Monitor.** Weiyang College - Civil Engineering Class 02. 09/2022 – 08/2023
  - Organized class meetings, including the representative elections for the Tsinghua University Student Assembly and the Weiyang College Student Assembly, and the election for the Class Council.
  - Assisted in other class activities, including Youth League class activities for Fall 2022 and Spring 2023.
- **Deputy Group Leader.** Industrial Investigation Group of Weiyang College. 02/2022 – 01/2023
  - Contributed to Weiyang College Industrial Investigation Team's achievement of the 2022 Tsinghua University Student Social Investigation Gold Medal Team Honor (Top 27 among more than 1000 teams and sub-teams), and the 2022 Tsinghua University Student Winter Social Investigation First Prize Team Honor (Top 20).
- **Team Leader.** Baseball Team of Weiyang College. 09/2020 – 08/2022
  - Established the Baseball Team of Weiyang College.
  - Led the team to achieve 4th place in Group B in 2020 Tsinghua Baseball Match and 6th place in Group B in 2021.