Yibo Wang

wangyibo321.github.io Wangyibo321 wangyibo2@stu.scu.edu.cn

Education

Sichuan University, College of Computer Science **Sept. 2021 - Jun. 2025**

B.Eng *in Computer Science (Yuzhang Honors Class, awarded for Top 3%)* *Sichuan, China*

- Major GPA: 3.85/4
- IELTS: 7.0
- Advisor: Prof. Jianguo Wang (Purdue); Prof. Mingjie Tang (SCU)

Publications

GPTuner: A Manual-Reading Database Tuning System via GPT-Guided Bayesian Optimization

- Jiale Lao, **Yibo Wang**, Yufei Li, Jianping Wang, Yunjia Zhang, Zhiyuan Chen, Wanghu Chen, Mingjie Tang, Jianguo Wang
- **VLDB** 2024

A Demonstration of GPTuner: A GPT-Based Manual-Reading Database Tuning System

- Jiale Lao, **Yibo Wang (Co-first)**, Yufei Li, Jianping Wang, Yunjia Zhang, Zhiyuan Chen, Wanghu Chen, Yuanchun Zhou, Mingjie Tang, Jianguo Wang
- **SIGMOD** 2024 Demo

Research Experience

Runtime-Efficient Adaptive Knob Tuning System **Mar. 2024 – Present**

Advisors: Prof. Jianguo Wang (Purdue); Prof. Mingjie Tang (SCU) ***Project Leader***

- Developed WAter, an adaptive knob tuning framework that uses runtime-profile to significantly reduce benchmark evaluation costs by only selecting SQL subsets to evaluate at different time slices.
- Proposed a novel greedy algorithm to optimize a runtime-statistics-based *representativity* metric, continually refining the subset as the optimization proceeds.
- Developed a new history reuse mechanism to achieve efficient subset tuning, mitigating the overheads of switching between tuning different subsets.
- Proposed a hybrid scoring method to prune, score and rank configurations, evaluating only the most promising configurations to achieve minimum overheads.
- Evaluated WAter under four OLAP workloads, it identifies better configurations with up to **73.5%** less tuning time, achieving up to **16.2%** better performance than the **best-performing** alternative.
- Outcomes: a research paper submitted to **SIGMOD** 2025, and an upcoming project to be open-sourced.

Automatic Optimization of Database with Large Language Model **Sept. 2023 – Present**

Advisors: Prof. Jianguo Wang (Purdue); Prof. Mingjie Tang (SCU) ***Research Assistant***

- Designed and implemented GPTuner, a novel manual-reading database tuning system that automatically exploits domain knowledge to enhance the knob tuning process.
- Developed an LLM-based data pipeline, a prompt ensemble algorithm, a workload-aware and training-free knob selection strategy, and a Coarse-to-Fine Bayesian Optimization Framework.
- Evaluated GPTuner under different benchmarks, metrics and DBMS. It identifies better configurations **16x** faster and achieves **30%** performance improvement over the **best-performing** alternative.
- Developed an LLM-powered interactive tool to engage users to probe into the ingenious pipeline which refines and unifies heterogeneous knowledge to guide system optimization.
- Outcomes: a research paper accepted by **VLDB** 2024, a demo paper accepted by **SIGMOD** 2024, and an open-source project with **70 stars** on GitHub.

Services

Subreviewer of VLDB 2024, VLDB 2025, and ICDE 2024