

# YIBO WANG

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## ☰ EDUCATION

Purdue University, Department of Computer Science	Aug. 2025 – Present
<i>PhD in Computer Science</i>	<i>West Lafayette, IN</i>
◦ Advisor: Prof. Jianguo Wang	
Sichuan University, College of Computer Science	Sept. 2021 – Jun. 2025
<i>B.Eng in Computer Science</i>	<i>Sichuan, China</i>
◦ GPA: 3.85/4	
◦ Advisor: Prof. Jianguo Wang; Prof. Mingjie Tang	

## ☰ PUBLICATIONS

### WAter: A Workload-Adaptive Knob Tuning System (Under Review)

- **Yibo Wang**, Jiale Lao, Chen Zhang, Cehua Yang, Yuanchun Zhou, Jianguo Wang, Mingjie Tang
- Under review at **SIGMOD** 2026, [Paper](#), [Project](#)

### QUITE: A Query Rewrite System Beyond Rules with LLM Agents (Under Revision)

- Yuyang Song, Hanxu Yan, Jiale Lao, **Yibo Wang**, Yufei Li, Yuanchun Zhou, Jianguo Wang, Mingjie Tang
- Under revision for **SIGMOD** 2026, [Paper](#), [Project](#)

### GPTuner: An LLM-Based Database Tuning System

- Jiale Lao, **Yibo Wang**, Yufei Li, Jianping Wang, Yunjia Zhang, Zhiyuan Chen, Wanghu Chen, Mingjie Tang, Jianguo Wang
- **SIGMOD Record** 2025, [Paper](#)

### 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, [Paper](#), [Project](#)
- Selected as **SIGMOD Research Highlight**

### 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, [Paper](#), [Video](#)

## ☰ Research Experience

Automated DiskANN Index Tuning via Machine Learning	Aug. 2025 – Present
<i>Advisor: Prof. Jianguo Wang</i>	<i>Project Leader</i>
◦ Developed a constrained multi-objective optimization pipeline to tune DiskANN, designed to jointly optimize recall, queries per second (QPS), and resource cost.	
◦ Employed multi-fidelity Bayesian optimization on dataset subsamples to reduce high build-parameter tuning cost, a feasibility classifier to enforce constraints, and additive-kernel GP surrogates to model monotonic domain knowledge.	
◦ Preliminary results: The method achieves up to <b>144%</b> higher QPS and <b>20%</b> lower monetary cost simultaneously over the <b>best-performing</b> baseline on SIFT100M, while satisfying the recall constraint.	

<b>A Query Rewrite System Beyond Rules with LLM Agents</b>	<b>Mar. 2025 – Present</b>
<i>Advisors: Prof. Mingjie Tang; Prof. Jianquo Wang</i>	<i>Research Assistant</i>
<ul style="list-style-type: none"> <li>○ Proposed QUITE, a training-free and feedback-aware query rewrite system that leverages LLM agents to support a broader range of query patterns and rewrite strategies than rule-based methods.</li> <li>○ Devised a multi-agent rewrite framework, a structured LLM-driven knowledge base, an agent context buffer, a hybrid SQL corrector, and a fine-grained hint injection technique.</li> <li>○ Evaluated QUITE on three OLAP workloads against state-of-the-art baselines, achieving up to <b>38.5%</b> lower latency and <b>24.1%</b> more successful rewrites over the <b>bestperforming</b> baseline.</li> <li>○ Outcomes: a research paper <b>under revision</b> for <b>SIGMOD 2026</b> and an upcoming open-source project.</li> </ul>	
<b>Runtime-Efficient Adaptive Knob Tuning System</b>	<b>Mar. 2024 – Oct. 2024</b>
<i>Advisors: Prof. Jianquo Wang; Prof. Mingjie Tang</i>	<i>Project Leader</i>
<ul style="list-style-type: none"> <li>○ 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.</li> <li>○ Proposed a runtime-statistics-based representativity metric to continually refine subset, a history reuse method to achieve efficient subset tuning, and a hybrid scoring mechanism to choose the most promising configurations to evaluate.</li> <li>○ Evaluated WATER under four OLAP workloads, it identifies better configurations with up to <b>73.5%</b> less tuning time, achieving up to <b>16.2%</b> better performance than the <b>best-performing</b> alternative.</li> <li>○ Outcomes: a research paper under review at <b>SIGMOD 2026</b> and an upcoming open-source project.</li> </ul>	
<b>Automatic Optimization of Database with Large Language Model</b>	<b>Sept. 2023 – Mar. 2025</b>
<i>Advisors: Prof. Jianquo Wang; Prof. Mingjie Tang</i>	<i>Research Assistant</i>
<ul style="list-style-type: none"> <li>○ Designed and implemented GPTUNER, a novel manual-reading database tuning system that automatically exploits domain knowledge to enhance the knob tuning process.</li> <li>○ 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.</li> <li>○ Evaluated GPTUNER under different benchmarks, metrics and DBMS. It identifies better configurations <b>16x</b> faster and achieves <b>30%</b> performance improvement over the <b>best-performing</b> alternative.</li> <li>○ Extended GPTUNER for cost-efficient online query optimization using LLM-enhanced contextual Bayesian optimization and online learning that preserves a concise yet representative training dataset.</li> <li>○ Outcomes: a research paper accepted at <b>VLDB 2024</b> and awarded the <b>SIGMOD Research Highlight 2024</b>, a demo paper accepted at <b>SIGMOD 2024</b>, an open-source project with <b>110+ GitHub stars</b>, and a journal paper to be submitted to <b>VLDBJ</b>.</li> </ul>	

## ☰ Services

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- Reviewer - TKDE [2025]
- Reviewer - Information Systems [2025]
- External Reviewer - VLDB [2024][2025]
- External Reviewer - ICDE [2024]
- Teaching Assistant, Purdue CS348: Information Systems [Fall 2025]

## ☰ Awards

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- SIGMOD Research Highlight, 2024