Xin Hu

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https://huxino817.github.io/

Education

Chengdu University of Technology ChengDu, China
Intelligent Science and Technology (Undergraduate) Sep. 2022 – Jul. 2026

- **GPA: 3.02/4.00**
- Professional Courses: Computer Operating Systems (93), Principles of Computer Organization (90), Database Principles and Design (90), Python Programming (90), Advanced Mathematics (91), Linear Algebra (81), Probability Theory and Mathematical Statistics (81), Data Structure (77), etc.
- Received **Outstanding Student Scholarship.**
- Actively studied **"Carnegie Mellon University (CMU) - 15-445/645: Database Systems"** course and completed assignments and labs during college.

Conference and Journal Publications

1. **Xin Hu**. "POUQ: A Clustering and Swarm-Optimized Framework for Precision-Driven Uniform Quantization of Non-uniform Data." *Expert Systems With Applications*, 2025. [Under review]

2. Tai Ming*, **Xin Hu***, Yimin Wu. "LiteQG: Towards Scalable and Memory-Efficient Graph-Based Approximate Nearest Neighbor Search." *International Conference On Intelligent Computing*, 2025. (*: Equal Contribution)

Professional Experience

DEWU (Shanghai Shizhuang Tech) Spring Bootcamp Shanghai, China
Backend Engineering Trainee Feb 2024 – May 2024

- Secured top 10% distinction among 500+ engineers through implementing distributed system design patterns (sharding, leader election) with Golang, completing 15+ technical assessments with 97% average score
- Designed fault-tolerant microservice architecture using Gin/GORM, enhancing API reliability by 25% through Hystrix circuit breakers and bulkhead patterns. Containerized deployments via Kubernetes (Minikube) with automated scaling policies
- Developed CI/CD pipelines with GitHub Actions for 8 training projects, reducing deployment time by 40% through container image optimization and parallel job execution

Xi'an Kuaike Information Technology HeartWall Chengdu, China
Golang Backend Developer Dec 2023 – Feb 2024

- Led full project lifecycle for SaaS platform development using Domain-Driven Design, delivering 3 core modules (user authentication, payment reconciliation, audit trail) that reduced transaction processing latency by 30%
- Optimized MySQL database performance achieving 20% faster query response through composite indexing strategies and query plan analysis. Implemented ACID-compliant transactions with GORM hooks for financial data integrity
- Engineered real-time notification system using WebSocket protocol and Redis Pub/Sub, increasing user engagement metrics by 15% as measured by Mixpanel analytics
- Established AWS S3 backup solution with AES-256 encryption and presigned URLs, achieving 99.9% data durability score. Automated backup validation using Python scripts

SELECTED AWARDS

2024 OceanBase Database Competition - **Second Prize** (3rd Nationally)   Jan. 2025

2024 OceanBase Database Competition - **First Prize Undergraduate** (1st Among Undergraduates)   Jan. 2025

2024 Computer System Development Capability Competition - Database Management System Design - **First Prize** (3rd Nationally)   Aug. 2024

PROJECTS

POUQ: A Clustering and Swarm-Optimized Framework for Precision-Driven Uniform Quantization of Non-Uniform Data

https://github.com/HuXin0817/POUQ   Mar 2025-Present

- Developed the novel **Krange** clustering algorithm, which implements interval partitioning through dynamic programming combined with **Knuth-Yao** optimization to minimize error upper bounds.
- Designed a **grid-initialized particle swarm optimization** method for zero-point and step-size calibration in uniform quantization, achieving lower quantization loss than **Faiss** library's calibration algorithms under identical training durations.
- Demonstrated **80%–99%** reduction in mean squared error compared to conventional uniform quantization methods on typical non-uniform datasets. This framework establishes a new technical pathway for efficient quantization, showing significant application potential in edge computing and low-power AI chip domains.

OceanBase Vector Database Optimization   Beijing,China

https://github.com/RushDB-Lab/oceanbase   Nov 2024-Jan 2025

- Optimized HNSW parameters (M=24, ef_search=120, ef_construction=200) maintaining **0.99 recall** while boosting QPS by **29.8%** through systematic hyperparameter tuning
- Designed centroid-proximity graph initialization with adaptive pruning rules, enabling **2,597 QPS** on 6-core CPU - **30% improvement** over baseline implementation
- Revamped vector search kernel by eliminating redundant table lookups and implementing covering indexes, slashing p99 latency from **250ms** to **40ms** for mixed OLAP/OLTP workloads

RMDB - Relational Database System   Zhengzhou,China

https://github.com/HuXin0817/RMDB   Jun-Aug 2024

- Engineered B+ tree-based composite indexes with leftmost prefix optimization, achieving **45% faster** complex query resolution through custom insertion/deletion algorithms
- Developed SS2PL lock manager supporting SQL-92 isolation levels, implementing Wait-Die concurrency control that reduced deadlock occurrences by **32%** compared to baseline
- Built WAL-based recovery system with static checkpoints, cutting crash recovery time by **58%** through parallel REDO/UNDO operations
- Optimized TPC-C benchmark performance to **32,820 txns/min** (x-factor: 3.28), securing 2nd place among 13 national finalists

SKILLS

Languages: Chinese, English.

Programming: C++ (3 year), Python, Golang, LaTeX.