Chang Peng

Contact Information
Renmin University of China
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EDUCATION

Renmin University of China 2021 - 2025
Beijing, China
BEng of Computer Science, GPA: 87/100, Major GPA 87.7/100, Rank 6/65

University of Waterloo 2025 - present
Waterloo, Canada
MEng of Electrical and Computer Engineering

RESEARCH INTERESTS

Distributed Systems, Cloud Computing and Edge Computing, Graph Computing

RESEARCH EXPERIENCE

Researcher April 2023 – November 2023
Supervised by Yahui Sun at Renmin University

Scaling Up Hop-constrained Shortest Path Labeling on Hybrid CPU/GPU Platforms

Objective: Accelerate the generation of k-hop-constrained shortest path labels on large graphs by optimizing CPU and GPU algorithms and leveraging hybrid CPU/GPU platforms for enhanced performance and scalability.

- Developed and implemented an enhanced label generation algorithm for k-hop-constrained shortest paths, optimizing memory usage on GPU platforms by introducing a custom memory pool for parallel label reading and writing.

- Conducted extensive validations on real-world datasets, demonstrating that our label generation method achieved a **3–5x** speedup in label generation and a **30%** increase in query efficiency compared to state-of-the-art methods.

Researcher July 2024 – March 2025
Supervised by Jinlong E at Renmin University

Turbulence: Enabling Inference of Large Models over Geo-Distributed Low-End Edge Servers (Working Paper)

Objective: Design a large-model inference framework for geo-distributed edge servers that optimizes cost, latency, and stability through advanced storage-aware algorithms and efficient routing strategies.

- Participated in the design of the online routing planning strategy for **Turbulence**, a large-model inference framework that integrates a storage-aware resource assembling algorithm to optimize inference tasks over edge servers.
- Engineered the experimental setup using the Petals framework, partitioning cluster nodes to simulate geographic distribution and introducing network delays and faults to emulate real-world latency and failure scenarios.

Researcher May 2025 – August 2025
Supervised by Jinlong E at Renmin University

QoE-Aware Live Video Streaming over Integrated Satellite–Terrestrial Networks (ISTNs) (Working Paper)

Objective: Design a lightweight framework that enables real-time end-to-end video streaming across ISTNs by addressing satellite mobility, bandwidth asymmetry, and streaming-specific QoE requirements.

- Participated in the design of the system architecture, introducing a hierarchical control mechanism where medium Earth orbit (MEO) satellites coordinate low Earth orbit (LEO) routing to ensure scalability and adaptability.
- Developed QoE-aware scheduling strategies that allocate processing priorities at the granularity of Group of Pictures (GOPs), reducing rebuffering and improving video smoothness under dynamic network conditions.

PROJECTS

Accelerating Graph Operators in a Multi-Model Database
Supervised by Yahui Sun at Renmin University
Role: Benchmark Tester and GPU Algorithm Developer Mar 2024 - December 2024

Objective: Conduct performance benchmarking and optimization of graph operators for multi-model databases on both CPU and GPU platforms.

- Performed *LDBC Graphalytics Benchmark* using ArangoDB 3.12 and its *Pregel API* to evaluate four graph operators: *PageRank, Weakly Connected Components, Community Detection using Label Propagation, and Single-Source Shortest Paths.*
- Developed a GPU-optimized *Breadth-First Search (BFS)* algorithm using the *Compressed Sparse Row (CSR)* format for graph storage and leveraged GPU parallel programming to achieve efficient traversal, resulting in a **5 to 10** times performance improvement over the BFS operator in the Neo4j database.

Transhub: A Network Simulation Testing Platform Specializing in Congestion Control Algorithm Performance
Supervised by Tong Li at Renmin University
Role: Team Leader, Full-Stack Developer June 2024 - Sep 2024

Objective: Build an efficient, scalable network simulation testing platform that supports large-scale concurrent evaluations of congestion control algorithms, significantly reducing user task queuing times and enhancing overall system reliability and availability.

- Led technology selection and architecture design, building a high-concurrency testing platform based on Nginx+Vue (frontend) and Flask+Redis+MySQL (backend).
- Implemented and debugged core functionalities, integrated the Mahimahi simulation tool, and optimized network parameters for enhanced performance and stability.
- Reduced user task queuing time by **80%**, successfully supporting a campus-wide computer networking competition and proving the platform's utility and efficiency.

HONORS & AWARDS

RUC Academic Excellence Scholarship 2,000 CNY Oct 2022

Second Prize in the 2024 ASC Student Supercomputer Challenge Feb 2024

First Prize (top 10%) in the 13th Lanqiao Cup National IT Competition (C/C++, Graduate Level) in Beijing Division Feb 2024

RUC Academic Excellence Scholarship 2,000 CNY Nov 2024

SKILLS & LANGUAGES

Technical Skills

- **Programming Languages**: C, C++, CUDA, Python, GO, Java, Rust, Javascript, SQL
- **Framework and Tools**: Linux, Kubernetes, Docker, Vue, SpringBoot, Flask, Pytorch

Languages

- Chinese (Mandarin, native)
- English (IELTS: 7.0)