Liang Wang

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Education

Huazhong University of Science and Technology — September 2021 – June 2024 (Expected)
MSc in Computer System Architecture — Wuhan, China

Wuhan University — September 2017 – June 2021
B. Eng in Software Engineering, GPA: 3.83/4.0, Rank: 16/258 — Wuhan, China

Selected Publications

Shoggoth: Towards Efficient Edge-Cloud Collaborative Real-Time Video Inference via Adaptive Online Learning

- **Liang Wang***, Kai Lu*, Nan Zhang, Xiaoyang Qu, Jianzong Wang, Jiguang Wan, Guokuan Li, Jing Xiao
- To appear in 60th ACM/IEEE Design Automation Conference **(DAC' 23)**. Acceptance rate: 23%.

Internship Experience

Ping An Technology (Shenzhen) Co., Ltd. — February 2022 – August 2023
Algorithm Engineer Intern — Shenzhen, China

- Worked on the **MetaEdge** project. MetaEdge is an edge AI platform with a suite of tools to build edge-based AI applications.
- Constructed the KubeEdge cluster; developed the custom Mapper to parse and format messages to facilitate communication between IoT devices and the edge; interfaced the MQTT Broker to TDengine via Kuiper to enable data persistence.
- Deployed Sedna on the KubeEdge cluster; created containerized vision AI applications with the Sedna edge-cloud collaborative incremental learning framework to adapt models running on edge devices over time; implemented the Unsupervised Hard Example Mining algorithm to automatically obtain challenging images for incremental learning.
- Developed video analytics applications using the DeepStream SDK and incorporated model merging, enabling the processing of multiple video streams in real-time when deployed on NVIDIA Jetson boards.

Huawei Cloud Computing Technologies Co., Ltd. — November 2020 – April 2021
Cloud Infrastructure Software Engineer Intern — Shenzhen, China

- Developed **SFS Turbo 2.0**. SFS Turbo 2.0 is a distributed file system that provides high-performance, scalable file storage.
- Implemented POSIX I/O interfaces of lookup and read, ensuring seamless workflow for these operations across multiple nodes.
- Achieved non-blocking Inode ID generation during concurrent file creation, with reference to the distributed ID generator Leaf.
- Improved the system throughput by 2-3x by utilizing memory pool and coroutine libraries and upgrading SPDK/DPDK.
- Generated unit test cases (gtest) and analyzed performance issues (vdbench, mdtest, FlameGraph) for the system.

PingCAP, Inc. — July 2019 – August 2019
PingCAP Talent Plan Training Program — Beijing, China

- Implemented **Index Advisor** for **TiDB**, an open-source distributed SQL database.
- Designed the index recommendation algorithm, inspired by DB2 Advisor; supported TiDB client-side interaction.
- Proved the effectiveness of Index Advisor by conducting TPC-DS tests, and demonstrated a 20x performance boost for some SQL queries after creating the recommended index.

Projects

LanguorDB: LSM-tree Based storage engine from ground-up, inspired by LevelDB. Designed the coarse-grained compaction strategy to reduce write amplification; implemented parallel lookup mechanism and row cache to optimize read efficiency.
MayflyCache: Lightweight implementation of a distributed cache. Used consistent hashing to select nodes for load balancing; implemented HTTP-based communication and Protobuf serialization data transfer; added singleflight to prevent hotspot invalidation.
HBtree: Hybrid DRAM-NVM index, whose structure is learned index ALEX (SIGMOD '20) in DRAM and B+Tree in NVM. Designed hot/cold identification to classify ALEX leaf nodes and construct B+trees from cold nodes to transfer cold data to NVM.

Competencies

Programming Languages: Go, C/C++, Rust, Python
Tech Focus: Edge Computing, Database Systems, Key-Value Storage Systems, Distributed Systems

Miscellaneous

Finished **MIT 6.824** and **CSAPP** computer course labs
Submitted 20+ PRs to well-known open-source software (TiDB, Sedna, etc.)