Liang Wang

(+86)157-7413-1055 | iggiewang@gmail.com | iggiewang.cn | hey-kong

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, and enabled 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.)