Lianke Qin

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Education

Shanghai Jiao Tong University, Shanghai, China 2015.9 – 2019.7(expected)

Bachelor of Engineering in Software Engineering

Hong Kong University of Science and Technology, Hong Kong, China 2017.9 – 2017.12

Exchange in Computer Science and Engineering

Publication

- **Lianke Qin**, Yifan Gong, Tianqi Tang, Yutian Wang, Jiangming Jin. Training Deep Nets with Progressive Batch Normalization on Multi-GPUs, International Conference on Network and Parallel Computing, 2018

Experience

Alibaba Group OceanBase Team(distributed database system) 2019.3-2019.8(expected)

Research Intern

- Explore and summarize database systems implemented with Log-Structured Merge tree like LevelDB, RocksDB and Kudu. Work on the optimization of query processing and data compaction for OceanBase based on LSM tree.

Tsinghua University Future Lab, Affective Computing Group 2018.8-2018.9

Research Assistant Supervisor : Prof. Yingqing Xu

- Focus on reducing emotional loss during Voice-to-Text process. Design an algorithm to analyze sentiment of the voice record and autonomously add corresponding Emojis into text to express more accurate emotion(Valence / Arousal). Also conduct a user experiment to test its improvement over pure text.

TuSimple(An Autonomous Truck Startup in China and USA) HPC Team 2017.12 – 2018.8

Research Intern Mentor : Dr. Jiangming Jin

- Optimize Batch Normalization Operator for MXNet, an open source machine learning model training framework, to improve Multi-GPU deep neural network training under small mini batch size by synchronizing key data among GPUs. Semantic Segmentation with DeepLab model on Visual Object Class Challenge 2012 dataset validation IoU score can improve up to 18.4%. Main features have been merged into MXNet master branch with the help from AWS AI team Dr. Hang Zhang. You can use **SyncBatchNormalization** operator in MXNet now.
- Learning from Kubeflow which combines Tensorflow and Kubenetes, try to deploy deep neural network training workflow based on MXNet on Kubernetes which eliminates many of the manual processes involved in deploying and scaling containerized applications.
- Write automated test script to help Hardware Group do GPU/CPU stress test, memory bandwidth test, disk I/O test and so on. And save all the results into Excel file.

Projects and Course Work

A naive file system implementation based on YFS

- Phase1 : Implement basic file system API like GET, PUT, REMOVE, CREATE, LOOKUP, MKDIR, LINK and UNLINK at inode level utilizing disk block manipulating API provided by YFS.
- Phase2 : Implement a simple lock server for clients to require/release when operating this file system
- Phase3 : Add a lock cache module in client side in order to reduce the workload on the lock server and improve client performance.

- Phase4 : Extend YFS file system to distributed one using HDFS interface to achieve fault tolerance and replicating data.

JOS

- Phase1 : Implement a physical memory and virtual memory manager to help kernel allocate/free memory and map virtual address to physical memory.
- Phase2 : Implement basic kernel facilities to get a protected user-mode environment process running and handle system calls and exceptions.
- Phase3 : Implement preemptive multitasking mechanism(Round-Robin scheduling) among multiple simultaneously active user-mode environments.
- Phase4 : Implement a simple disk-based file system

A DNA simulator based on HTC Vive

- Build your DNA based on the principle of complementary base pairing freely(with automated completion)
- Demonstrate how DNA helix is constructed ,its reverse process, and DNA transcription process.
- Use restriction endonuclease to cut DNA helix at specific location
- Persistently save DNA information and restore it when needed

A naive key-value store based on B+ tree

This naive key-value store supports basic CRUD. The index of database is constructed into a B+ tree to speed up CRUD. Get the location and length of value corresponding to key and read it from data file. Garbage collection is implemented to reduce disk fragmentation due to frequent updating. Besides, a cache module is included to speedup CRUD using LRU replacement policy(implemented with a doubly linkedlist and a hashmap). Fault tolerance with logging scheme and transaction mechanism are not supported yet.

Positive Time : An Android APP

This app aims to record app usage info so that it can provide data visualization and help users quit mobile phone addiction by Pomodoro Technique. Focus on back end server development including database design,recommendation system. Use K-means algorithm to divide users into several groups according to their app usage pattern. Then push new apps users may love using user-based collaborative filtering.

A simple path-tracking car

Computer analyses picture(black path in white background) taken by a fixed camera using OpenCV and extracts the path from it. Control the car go ahead, back or change direction using Arduino while constantly monitoring its moving progress. But it is not adaptively tolerant to surrounding noise.

Activities and Awards

Shanghai Jiao Tong University Merit Student	2016.9
Shanghai Jiao Tong University Academic Progress Award	2017.9