Bowen WU

Github : https://www.github.com/BowenforGit

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EDUCATION

The Chinese University of Hong Kong (CUHK), Hong Kong
Bachelor of Science (BSc), Computer Science
Sep 2016 – May, 2020   CGPA: 3.87/4.00

ETH Zurich, Switzerland
Exchange Student, Computer Science
Feb 2019 – Aug 2019   CGPA: 5.15/6.00

RESEARCH EXPERIENCE

Distributed Graph Database and Graph Mining   **Sep 2019 - Now**
Advisor: Prof. James Cheng,   ***CUHK***
- Understanding design paradigms of popular distributed graph processing systems
- Extending operators of a distributed graph database **Grasper** for OLAP workload
- Devising a more efficient distributed system architecture for query processing with better asynchronous scheduling, CPU utilization and network latency

Technology/Tools: C++11/14, MPI, OpenMP, RDMA, Distributed graph database, Graph mining system (Pregel, GraphX, etc.), Distributed graph algorithms, Query Optimization

Fairness in Machine Learning   **June 2019 - Now**
Advisor: Prof. Pulkit Grover, ECE Department   ***Carnegie Mellon University***
- Understanding and comparing probability- and causality-based definitions of fairness
- Propose a novel information theoretic measurement for fairness
- Devising machine learning algorithms to integrate the above measurement
- Designing a real-world news feed system where we applied our algorithm to fix the "rabbit holes" issue

Publication: Submitted to AI Ethics and Society 2020

Technology/Tools: Information theory, Mathematical optimization, Causal Reasoning, Tensorflow, MongoDB

DS3Lab: Non-shuffle SGD algorithm   **Mar - May 2019**
Advisor: Prof. Ce Zhang, Kaan Kara (PhD)   ***ETH Zurich***
- Understood the non-shuffle Stochastic Gradient Descend proposed by Kaan Kara
- Optimized the non-shuffle SGD implementation using AVX instructions and memory prefetch techniques
- Extended the implementation to automatically infer optimal parameters according to datasize and cacheline.

Technology/Tools: C++11, CPU and cache management, AVX instructions
Code: https://github.com/BowenforGit/Partial-Shuffling-SGD

Large Scale Similarity Search   **May 2018 - Feb 2019**
Advisor: Prof. James Cheng   ***CUHK***
- Tested state-of-the-art similarity search algorithms, e.g., PQ, IMI, HNSW
- Accommodated the HNSW algorithm to the maximum inner product search problem

Technology/Tools: C++11, CMake, OpenMP

PROJECTS

Stanford Pintos Operating System

Implemented a small but complete operating system with four main functions: Synchronization, User Program Execution, Memory Management, File System.
- **Technology/Tools:** C, Assembly, GDB, Emulator

Reliable Transfer on UDP
Implemented Sliding Window Protocol (Go-Back-N) on User Datagram Protocol to ensure reliable message delivery. Avoided corrupted, duplicated and out-of-order packets.
- **Technology/Tools:** C, Event-driven programming

Routing Information Protocol (RIP)
Implemented the Routing Information Protocol v2 based on RFC 2453. Employed distance vector algorithm and applied "split horizon with poison reverse" to tackle the convergence issue.
- **Technology/Tools:** C, Event-driven programming, Intra-domain Routing

Deadline Fighter: Mini-program
Designed and implemented a wechat mini-program, "Deadline Fighter" to facilitate online collaboration. Worked as the team leader and back-end engineer.
- **Code:** http://github.com/BowenforGit/weChat

Private Information Retrieval
Understood the motivations behind PIR and basic techniques. Implemented a toy system to simulate an easy PIR coding algorithm.
- **Technology/Tools:** Finite field theory, Information theoretic privacy

TECHNICAL SKILLS	**Programming Languages :** Python, C++, C, Java, Matlab **Database :** PostgreSQL, MongoDB **Tools :** OpenMP, MPI, RDMA, ZeroMQ, AVX, Minizinc

HONOR AWARDS

- **Computer Science Scholarship**   Apr 2018
Granted by : Department of Computer Science, CUHK

- **Dean's List**   Mar 2018 and Feb 2019
Granted by: Faculty of Engineering, CUHK

- **Charles K.Kao Summer Research Internship**   Dec 2018
Granted by: Faculty of Engineering, CUHK

- **Arthur and Louise May Scholarship**   May 2019
Granted by: Arthur and Louise May Memorial Fund

CERTIFICATE

- **TOEFL Score: 108**   Jan 6, 2019
Reading: 29, Listening: 27, Writing: 27, Speaking: 25

- **GRE Score: 327+4**   Sep 20, 2019
Verbal: 157 (76%); Quantitative: 170 (96%); Writing: 4 (57%)

- **Saxophone Grade 9**
First Prize of Beijing, National Excellence Award

GRADUATE COURSES TAKEN

- Matrix Analysis and Computation   • Statistical Learning Theory
- Principles of Distributed Computing   • Foundations of Optimization
- Combinatorial Search and Optimization with Constraints

ADDITIONAL	• Editor of Real Estate Investment Club, CUHK	**Sep 2016 - Sep 2017**
ACTIVITIES	• Vice-president of Morning Run Club, CUHK	**Sep 2017 - Sep 2018**
	• i-Ambassador, CUHK	**Sep 2017 - Sep 2018**