

Bowen WU

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EDUCATION

The Chinese University of Hong Kong (CUHK), Hong Kong
Bachelor of Science (BSc), Computer Science cumulative-GPA: 3.77/4.00
Sep 2016 – May 2020 (Expected) major-GPA: 3.80/4.00

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

RESEARCH EXPERIENCE

Distributed Graph Database Sep 2019 - Now
Advisor: Prof. James Cheng **CUHK**
• Design high-performance distributed algorithms for executing advanced query operators over large-scale property graphs for OLAP/OLTP workload
• Program advanced query operators based on the distributed graph database Grasper

Technology/Tools: *Distributed graph database, Distributed graph algorithms, Query Optimization, Gremlin, C++17, MPI, OpenMP, RDMA*

Fairness in Machine Learning June - Nov 2019
Advisor: Prof. Pulkit Grover **Carnegie Mellon University**
• Developed a novel information theoretic measurement for fairness
• Incorporated information-theoretic fairness in machine learning models
• Designed a real-world news feed system to fix the “echo chamber”

Technology/Tools: *Information theory, Optimization, Causal reasoning*

Partial-shuffling SGD Algorithm Mar - May 2019
Advisor: Prof. Ce Zhang, Kaan Kara (PhD) **ETH Zurich**
• Optimized the partial-shuffling SGD implementation using AVX instructions and memory prefetch techniques and halved the execution time
• Added a new feature of automatic optimal parameters inference

Technology/Tools: *C++11, AVX instructions*
Code: <https://github.com/BowenforGit/Partial-Shuffling-SGD>

Large Scale Similarity Search May - Dec 2018
Advisor: Prof. James Cheng **CUHK**
• Profiled state-of-the-art similarity search algorithms and identified respective defects
• Accommodated the HNSW algorithm to the maximum inner product search problem

Technology/Tools: *Advanced data structures, Searching techniques*

PUBLICATION

Bowen WU, Chenyu Jiang, Sanghamitra Dutta, Pulkit Grover, “Burst the Bubble: Debiasing Recommendation Systems While Allowing for Chosen Category Exemptions”, *to be submitted in January*.

PROJECTS

Stanford Pintos Operating System
Implemented a small but complete operating system with four main functions: Synchronization, User Program Execution, Memory Management and File System.

Technology/Tools: *C, Assembly, GDB, Emulator*

Deep Learning on Graph Structures

Compared two state-of-the-art structured graph embedding methods, i.e., Mean-Field Inference and Loopy Belief Propagation. Designed a neural network for classifying drug efficacy based on embedding vectors and achieved >90% accuracy.

Technology/Tools: *Statistical learning, Deep neural network, PyTorch*

Deadline Fighter: Mini-program

Developed 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>

TECHNICAL SKILLS

Languages : Python, C++17, C, Java, Matlab, Minizinc

Databases : PostgreSQL, MongoDB

Tools : OpenMP, MPI, RDMA, ZeroMQ, AVX, Tensorflow, PyTorch, CMake

GRADUATE COURSES

- Matrix Analysis and Computation
- Statistical Learning Theory
- Principles of Distributed Computing
- Foundations of Optimization (*in progress*)
- Combinatorial Search and Optimization with Constraints (*in progress*)

HONOR AWARDS

• **Arthur and Louise May Scholarship** **March 2019**
Granted by: Arthur and Louise May Memorial Fund (50K HKD)

• **Charles K.Kao Summer Research Internship** **Dec 2018**
Granted by: Faculty of Engineering, CUHK (46K HKD)

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

• **Computer Science Scholarship** **Apr 2018**
Granted by : Department of Computer Science, CUHK (50K HKD)

• **Elite Stream Scholarship** **Sep 2017-19**
Granted by: Faculty of Engineering, CUHK (Cumulative 44K HKD)

• **Soong Ching-ling Zhiyuan Scholarship** **Sep 2016**
Granted by: Soong Ching-ling Foundation (223K HKD)

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

ADDITIONAL ACTIVITIES

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