香 港 大 學
THE UNIVERSITY OF HONG KONG

Haoran QIU

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EDUCATION

The University of Hong Kong (HKU) **Hong Kong**
B.Eng. in *Computer Science* | Minor in *Mathematics* ***Sept.2015 - May.2019 (Expected)***

- CGPA: 3.81/4.30 (Rank: 8/111), Major GPA: 4.0/4.3
- Core Courses: *Data Structures and Algorithms, Computer Organization, Operating Systems, System Architecture and Distributed Computing, Database Systems, Object-oriented Programming, Linear Algebra, Calculus, Probability & Statistics, Discrete Mathematics, Artificial Intelligence*
- **Teaching Assistant:** COMP 2396 *Java and Object-oriented Programming* (*Fall 2017)*

University of Wisconsin - Madison **WI, USA**
Visiting Student, College of Engineering ***Jan.2018 - May.2018***

- CGPA: 4.0/4.0, Major GPA: 4.0/4.0
- Courses: *Advanced Algorithms, Computer Networks, Introduction to Optimization, Analysis I*

PUBLICATIONS

[1] Shixiong Zhao, Rui Gu, **Haoran Qiu**, Tsz On Li, Yuexuan Wang, Heming Cui, and Junfeng Yang, *OWL: Understanding and Detecting Concurrency Attacks*, Proceedings of the 48th IEEE International Conference on Dependable Systems and Networks 2018 (**DSN '18**), Luxembourg
[2] Cheng Wang, Xusheng Chen, Weiwei Jia, Boxuan Li, **Haoran Qiu**, Shixiong Zhao, and Heming Cui, *PLOVER: Fast, Multi-core Scalable Virtual Machine Fault-tolerance*, Proceedings of the 15th USENIX Symposium on Networked Systems Design and Implementation 2018 (**NSDI '18**), USA
[3] Lei Kang, **Haoran Qiu**, etc., *AutoMice: A Testbed Framework for Self-Driving Sytems* (Preprint)
[4] Tao Ji, Wei Zhao, **Haoran Qiu**, Bozhao Qi, and Suman Banerjee, *VIVID: Augmenting Vision-based Indoor Navigation System with Edge Computing and Deep Learning*, The 17th ACM International Conference on Mobile System, Application and Services 2019 (**MobiSys '19**, under review), Seoul

RESEARCH EXPERIENCES

Area of Interests: ***Distributed Systems, Networks, Operating Systems***

WiNGS Lab, **University of Wisconsin - Madison** **WI, USA**
Undergraduate Research Assistant, supervised by Prof. Suman Banerjee ***Jan.2018 - Apr.2018***

VIVID: Augmenting Vision-based Indoor Navigation System with Edge Computing. It provides accurate localization, scalability, and user privacy protection. [Paper under review, **MobiSys '19**].

- Developed the back-end by using SLAM to locate and navigate, and using Elasticsearch to improve image storage efficiency, search scalability and performance.
- Evaluated bandwidth consumption and scalability comparison between cloud and edge computing.

AutoMice: Self-driving Car Testbed. Portable and extensible testbed framework that offers developers an environment to experiment with self-driving algorithms [*Paper*][*Code*].

- Developed and evaluated different object detection algorithms and integrated into the system. E.g. mean square error method, cascade classifier, single shot multibox detector, and YOLO.
- Designed algorithms for collision avoidance and detection based on geometric properties.
- Collaborated with teammates to present the self-driving car demo in ACM HotMobile 2018, Arizona.

Systems Software Group, **The University of Hong Kong** **Hong Kong**
Undergraduate Research Assistant, supervised by Dr. Heming Cui ***Aug.2017 - Present***

PLOVER: the first Virtualized State Machine Replication (VSMR) system to achieve fast and multi-core scalable VM fault-tolerance. [*Paper*] [*Code*]

- Designed an algorithm to determine the optimal time to synchronize between two VMs: synchronize when CPU usage or I/O usage is above a bar set based on the idle stage. Compared to static way, the latency is improved by around 25% in various systems.
- Evaluated our system on various applications like MySQL, PostgreSQL, Redis, Django, and Tomcat.

OWL: Understanding and Detecting Concurrency Attacks. OWL, the first practical tool that models general concurrency attacks' implicit consequences and automatically detects them.[*Paper*] [*Code*]

- Designed and simplified the overall model by extracting key steps from different parts of the system.
- Evaluated OWL on MySQL, Apache and Linux Kernel.

WORK EXPERIENCES

Credit Suisse Group **Hong Kong**
Software Engineer Intern, Risk IT Department ***Jun.2018 - Aug.2018***
Chinchilla: A big data system for risk information storage and processing.

- Developed a pipeline for data compression and zero stripping, which improved storage 4-5 times;
- Added new features to the project. E.g. developed multi-risk report designer using React-Redux;

Hututa Technology Ltd. **Hong Kong**
R&D Software Engineer Intern ***July.2017 - Aug.2017***
Data Thinker: A distributed data processing system for extending data processing ability of programs.

- Extended the API for a biology gene mapping program called Stampy, which is 10 times faster;
- Developed a network monitor system and added dynamic DNS update function;

PROJECT EXPERIENCES

JPoker 24-Game: Distributed Systems Course Project [*Code*] ***Mar.2017***
This is a distributed game implemented in Java. The server-client communication was implemented using RMI (for authentication) & JMS (for message delivery), where the broadcast-subscribe model was used for efficiency. JDBC and MySQL were used to build the game database.

Final Year Project [*Website*]**,** *supervised by Dr. Heming Cui* ***Sept.2018 - Present***
Augmenting Blockchain System Efficiency and Security with TEE-Facilitated P2P Overlay Network
Paper on submission: **Haoran Qiu**, Tao Ji, Xusheng Chen, Shixiong Zhao, Tiankai Wang, and Heming Cui, Proceedings of the 2019 USENIX Annual Technical Conference (**ATC '19**)

HONOR & AWARDS

- Visiting International Student Academic Excellence Award, UW-Madison ***July.2018***
- Lee Shau Kee Scholarship, Department of International Affairs, HKU (Top 3%) ***Feb.2018***
- Best Residential Hall Student Advisor, Suen Chi Sun Hall ***April.2017***
- Honorable Mention in Mathematical Contest In Modeling, COMAP ***Feb.2017***
- Champion of Undergraduate Men's Basketball Competition, HKU ***April.2016***
- Dean's Honor List, Faculty of Engineering, HKU (Top 5%) ***2015-16, 2017-18***
- HKU Foundation Scholarships For Outstanding Students, HKU ***Sept.2015***

SKILLS & LANGUAGES

- **Programming Languages:** C/C++, Java, Python, JavaScript (AngularJS, React, Vue.js), HTML5, CSS, PHP, SQL, Swift, Haskell, Go, Matlab, GNU Octave, Julia
- **Software & Tools:** GNU/Linux, OpenCV, Git, Jupyter, Wireshark, Valgrind, OpenPAT, PostMan, Bootstrap, Nginx, Docker, Elasticsearch, LaTeX, Markdown, Arduino, Gnuplot, Django