

EDUCATION

- Carnegie Mellon University** Pittsburgh, US
• *Ph.D. in Computer Science* Feb. 2021 - Present
- Peking University** Beijing, China
• *Bachelor of Science (Honored) in Computer Science* Sep. 2016 - Jul. 2020
 - **Turing Class**: First honor class
 - **GPA**: 3.73/4.00

WORKING EXPERIENCE

- Shanghai Qizhi Institute** Shanghai, China
• *Research Assistant, advised by Prof. Dong Zhou* Aug. 2020 - Feb. 2021

PUBLICATIONS

- Wang, M.*, Zhou, M.*, Shi, S., & Qian, C. **Vacuum Filters : More Space-Efficient and Faster Replacement for Bloom and Cuckoo Filters**. VLDB, 2020.
*Equal contribution.
- Hou, C.*, Zhou, M.*, Ji, Y., Daian, P., Tramer, F., Fanti, G., & Juels, A. **SquirRL: Automating Attack Analysis on Blockchain Incentive Mechanisms with Deep Reinforcement Learning**. NDSS 2021.
*Equal contribution.

RESEARCH EXPERIENCES

Mercury: Fast Transaction Broadcast in High Performance Blockchain System
Advisor: Prof. Dong Zhou Aug. 2020 - Feb. 2021

- Built a robust network virtual coordinate in malicious network
- Constructed a broadcast scheme based on location-awareness clustering and early outburst strategy
- Achieved more than 50% latency improvement in Conflux Networ(1000 nodes)
- Paper submitted to NSDI 2022

VRecon: An Efficient Set Reconciliation Algorithm
Advisor: Prof. Yunhuai Liu, Prof. Chen Qian Apr. 2020 - Jul. 2020

- Designed an efficient set reconciliation algorithm based on Vacuum Filter and Invertible Bloom Filtler.
- Achieved 45% more bandwidth saving compared to existing works using matching vector optimization.
- Achieved both scalability and robust performance within linear time complexity.

SquirRL: Automating Attack Analysis on Blockchain Incentive Mechanisms with DRL
Advisor: Prof. Giulia Fanti, Prof. Ari Juels Jun. 2019 - Jun. 2020

- Proposed a general framework for automatical attack discoveries on complex blockchain protocols.
- Implemented interactive environments for Bitcoin/Ethereum/GHOST protocols, supporting multi-agent setting.
- Achieved best attack results in real-data simulations with reinforcement learning.

Vacuum Filters : More Space-Efficient and Faster Replacement for Bloom and Cuckoo Filters
Advisor: Prof. Chen Qian Mar. 2019 - Aug. 2019

- Proposed new table structures based on Cuckoo Filter to achieve SotA memory utilization.
- Optimized insertion/lookup and implemented parallel operations, achieving SotA throughput performance.
- Proposed a dynamic re-construction scheme for real application.

COMPETITIONS

International Collegiate Programming Contest, Regional Gold Medal, <i>ICPC Foundation</i>	Oct. 2018
National Olympiad of Informatics, Gold Medal, <i>China Computer Federation</i>	Aug. 2015

AWARDS AND HONORS

Outstanding Dissertation for Bachelor's Degree (Top 10 in the EECS school), <i>PKU</i>	Jun. 2020
Turing Benteng Scholarship, <i>PKU</i>	Nov. 2019
Kwang-Hua Scholarship (Top 3 in class, ~1% of students), <i>PKU</i>	Dec. 2018
Chuang-Long Ke Scholarship, <i>PKU</i>	Dec. 2017
Dean Scholarship for Freshman, <i>PKU</i>	Sep. 2016