

Dr. Ju Chen

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Summary

- Ju Chen is a senior researcher at CertiK Inc., a Web3 security startup. Prior to obtaining his Ph.D. in Computer Science from UC Riverside, he worked as a software engineer at Intel for seven years. With a strong track record of publishing in top-tier CS conferences like IEEE Symposium on Security and Privacy and USENIX Security Symposium, Ju Chen has amassed 14 years of experience in systems software and seven years in cybersecurity research.

Education

Riverside, CA <ul style="list-style-type: none">Ph.D. in Computer Science	University of California, Riverside	September 2019 - June 2022
Syracuse, NY <ul style="list-style-type: none">Ph.D. candidate in Computer Science (transferred to UCR in 2019)	Syracuse University	September 2015 - May 2019
Beijing, China <ul style="list-style-type: none">Master in Electrical Engineering	Beihang University	Fall 2005 – Spring 2008
Beijing, China <ul style="list-style-type: none">Bachelor in Electrical Engineering	Beihang University	Fall 2001 – Summer 2005

Employment

- Jan 2023 - Present** Senior Research Scientist, CertiK
- October 2022 - Jan 2023** Research Scientist, Deepbits Technology
- September 2019 - June 2022** Research Assistant, UC Riverside, Riverside CA
- Summer 2019** Research Intern, Baidu USA, Sunnyvale CA
- September 2015 - May 2019** Research Assistant, Syracuse University, Syracuse NY
- Spring 2008 - Fall 2015:** Software Engineer, Intel China Research Center, Beijing, China

Project Experiences - in reverse chronological order

- Web3 Security - Sr. Research Scientist at CertiK.**
 - Developed model checking tools to formally prove the properties of Smart Contracts (Solidity programs)
 - Tech stack: OCAML/Solidity
- Software Supply Chain Security - Research Scientist at Deepbits Technology.**
 - Developed tools to identify Software Bills of Materials (SBOM).
- Open Source Software Security (fuzzing, vulnerability discovery) - PhD thesis at UCR.**
 - Designed and implemented a scalable symbolic executor that is two orders of magnitude time faster than state-of-the-art tools and has a much smaller (up to 1000x) memory footprint.
 - Designed and implemented a super-fast constraints solver that is linearly scaled to multi-cores and beat popular constraint solvers.
 - Papers accepted to Usenix'22 and Oakloand'22 (top-tier security conferences)
 - Tech stack: C++/Rust/protobuf/LLVM/JIT
- Trusted Computing - Research intern at Baidu USA**
 - Contributed to MesaTee: Baidu's secure computing framework. MesaTee is built on top of Intel's SGX.
 - Created a key-value store library prototype based on LevelDB and integrated it into the MesaTee framework (internal branch).
 - Tech stack: C++/Rust/Intel SGX
- Side-channel vulnerability mitigation - Research assistant at Syracuse U.**
 - Designed and implemented a cache-oblivious computing framework. It manages a memory mapping inside the CPU cache and guarantees zero-cache-misses on writes/reads issued by upper-layer algorithms such as merge-sort, k-means, and sorting network.
 - Paper accepted by SysTex 2017 at ACM SOSP
 - Tech stack: C++/Assembly.
- Trusted computing - Research assistant at Syracuse U.**
 - Refactored LevelDB to be a secure storage system using Intel SGX.

- Paper accepted by Middleware’21
- Tech stack: C/C++/key-value storage system/Intel SGX
- **Linux device drivers development - SWE at Intel Corporation**
 - Core development team member for Intel peripherals such as USB and graphical devices (display controller and 3D engine).
 - Fixed lots of urgent software issues raised by Intel’s OEM customers and received positive feedbacks.
 - Primary maintainer for the display controller driver.
 - Primary maintainer for the USB-client and USB-over-IP driver.
 - Tech stack: C/Linux Kernel/Hardware specs

Publications

- **Ju Chen**, Wookhyun Han, Mingjun Yin, Haochen Zeng, Chengyu Song, Byoungyong Lee, Heng Yin, and Insik Shin, SymSan: Time and Space Efficient Concolic Execution via Dynamic Data-Flow Analysis, 31st USENIX Security Symposium, August 2022.
- **Ju Chen**, Jinghan Wang, Chengyu Song, Heng Yin, ”JIGSAW: Efficient and Scalable Path Constraints Fuzzing”, 43rd IEEE Symposium on Security and Privacy 2022
- Yuzhe Tang, K. Li, Q. Zhang, J. Xu, **Ju Chen**. ”Authenticated Key-Value Stores with Hardware Enclaves”, ACM/IFIP Middleware 2021 (Industrial track)
- Yuzhe Tang, **Ju Chen**, Kai Li, ”Authenticated LSM Trees with Minimal Trust”, SecureComm 2019
- Qiwu Zou, Yuzhe Tang, **Ju Chen**, Kai Li, Charles Kamoua, Kevin Kwiatt, Laurent Njilla. ”ChainFS: Blockchain-Secured Cloud Storage”, IEEE Cloud 2018
- K. Areekijseeree, Yuzhe Tang, **Ju Chen**, Shuang Wang, Arun Iyengar and B. Palanisamy. ”Secure and Efficient Multi-Party Directory Publication for Privacy-Preserving Data Sharing.” SecureComm 2018, AR=30.6%
- Yuzhe (Richard) Tang, Zihao Xing, **Ju Chen**, Cheng Xu and Jianliang Xu. ”Lightweight Logging over the Blockchain for Data-Intensive Applications”, 2nd Workshop on Trusted Smart Contracts 2018 at Financial Cryptography (Workshop paper)
- **Ju Chen**, Yuzhe (Richard) Tang and Hao Zhou. ”Strongly Secure and Efficient Data Shuffle on Hardware Enclaves”, SysTex 2017 at ACM SOSP (Workshop paper)
- Yuzhe Tang and **Ju Chen** ”Log-structured Authenticated Cloud storage with minimal trust using Intel SGX”, Technical Report (<https://eprint.iacr.org/2016/1063.pdf>)
- John Ye, **Jason Chen**, Tianzhou Chen and Qinsong Shi, ”Conflict-Free Code Block Scheduling to Hide SpMT Inter-Core Register Sync Delay”, PDCAT ’14
- John Ye, **Jason Chen**, Tianzhou Chen, Minghui Wu and Li Liu, ”Offline Data Dependence Analysis to Facilitate Runtime Parallelism Extraction”, CSE ’14
- **Ju Chen**, Qi Zhao and Jinming Dong, ”Research on kernel encoding function of H.264 CODEC JM8.6”, Computer Engineering and Design 2008-17

Awards and services

- **2017**: iDash 2017 Student Travel Grant
- **2009 2010**: Intel Division Recognition Award
- **Conference Reviewer**: USENIX Security, IEEE Symposium on Security and Privacy, TKDE and ICPADS,

Research Experiences

- **2019-2022** Finding software vulnerabilities in binaries and open-source projects using fuzz testing and symbolic execution. The research results are in the peer-review process in the top CS conferences.
- **2015-2019** Enabling secure key-value storage systems using hardware-assisted trusted execution environment and enabling efficient confidential computing. The research results are published in SecureComm and Systex.

Teaching

Teaching Assistant	University of California, Riverside	Spring 2020 - Present
• CS153 - Design of Operating Systems (course website)		
Teaching Assistant	Syracuse University	Spring 2017 - May 2019
• CIS655 - Advanced Computer Architecture (course website)		
• CIS/FIN600 - Blockchain and Cryptocurrencies (course website)		