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Ju Chen

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Short Biography

- Ju Chen is currently a Ph.D. candidate in Computer Science at the University of California at Riverside. His research works are published in SecureComm, IEEE Cloud, SysTex, etc. He has seven years of working experience as a software engineer in Intel Corporation, Agilent Technologies, and Baidu, and twelve years of systems-level software developing experience in Linux kernel, storage systems, and software security. The 3D, display, USB Linux device drivers he contributed to are deployed to all Intel-powered workstations, desktops, laptops, and tablets. He is enthusiastic about software engineering and building efficient, secure, and widely-used software systems. He is an excellent team player and a problem-solver.

Skills

- **Main focus:** Operating systems-level programming (e.g. IPC, forking and signal handling), Just-in-Time compilation, program instrumentation, performance profiling, and performance optimization.
- **Programming Languages:** Proficient in C/C++/Rust/Python. Familiar with Java/Lua/Matlab/HTML/Assembly.
- **Tools, libraries and open-source code-bases:** Proficient in GDB/Git/CMake/Gperftools/Valgrind/protobuf/LevelDB/AFL.

Employment

- **Summer 2019:** Research Intern, Baidu USA, Sunnyvale CA
- **Spring 2008 - Fall 2015:** Software Engineer, Intel Corporation, Beijing, China
- **2007:** Software Engineer Intern, Agilent Technologies, Beijing, China

Project Experiences

- **Automatic test case generation for fuzz testing - current research project**
- **MesaTee: Baidu's secure computing framework - a project participated as an intern in Baidu USA (Summer 2019)**
  - I created a key-value store library prototype based on LevelDB and integrated it into the MesaTee framework (internal branch). The prototype was frequently referenced by Baidu's security team. I helped three Baidu colleagues to understand and use the library.
  - I preliminary integrated a WebAssembly Just-in-Time compiler to the MesaTee framework.
  - Main problems solved in this project: compiler linking script hacking and multi-language co-programming.
  - Programming languages used in the project: C++/Rust.
- **Cache-oblivious computing framework (2018)**
  - I 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.
  - Programming languages used in the project: C++/Assembly.
- **Secure key-value store using Intel SGX (2016,2017)**
  - I redesigned and refactored LevelDB (Google's key-value store library). I partitioned the codebase into a part that can run securely in Enclave) and a non-secure part (that can't run in Enclave due to syscalls). The integrity of the data exchanged between secure/non-secure parts is verified by checking the Merkle-tree based digest.
  - The main techniques in the project are key-value storage systems design and C++ programming.
- **Linux device drivers development (2008-2015)**
  - I was a member of the core development team for Intel peripherals such as USB and graphical devices (display controller and 3D engine). Our device drivers are directly used or referenced by NEC, Dell, Lenovo, and many more.
  - I fixed numerous urgent software issues raised by Intel's OEM customers and received positive feedbacks. Example issues: booting time exceeded expectation, black-screen during device waking up, and corrupted/flickering display.
  - I was the primary maintainer for the display controller driver.
  - I was the primary maintainer for the USB-client and USB-over-IP driver.
  - The main techniques in the project are C/Shell programming and Linux Kernel programming.
  - Main problems solved: Software/hardware co-programming and debugging.
- **Misc. projects**
  - I configured this conference paper submission/review website in Google Cloud: https://submit.acsac.org/papers21

Education

Riverside, CA	**University of California, Riverside**	**Fall 2019 – Present**

- Ph.D. candidate in Computer Science (anticipated graduation date: January 2022)

Syracuse, NY	**Syracuse University**	**Fall 2015 – 2019**

- Ph.D. candidate in Computer Science
- Graduate Coursework: Computer Security; Cloud Computing; Operating systems; Applied Cryptography

Beijing, China	**Beihang University**	**Fall 2001 – Spring 2008**

- Bachelor and Master in Electrical Engineering

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)

Research Experiences

- **2019-present** 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.
- **2015-2018** 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.

Publications

- 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 Kwiat, Laurent Njilla. "ChainFS: Blockchain-Secured Cloud Storage", IEEE Cloud 2018
- K. Areekijseree, 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:** TKDE and ICPADS