

CONTACT
INFORMATION

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RESEARCH
INTERESTS

Software Security, Software Verification, Software Engineering

EDUCATION

Georgia Institute of Technology Georgia, USA
Ph.D. in Computer Science Aug, 2020 - Present
Adviser: Taesoo Kim

National Chiao Tung University Hsinchu, Taiwan
B.S. in Computer Science Sep, 2015 - Jan, 2019

ACADEMIC
EXPERIENCE

Georgia Institute of Technology Georgia, USA
Research Assistant Aug, 2020 - Present
Adviser: Taesoo Kim

- autofz: automated fuzzer composition at runtime
 - Design and implement a meta-fuzzer - autofz which orchestrates fuzzers based on runtime information.
 - The work is published at USENIX Security 2023 [1].

Academia Sinica Taipei, Taiwan
Research Assistant Oct, 2018 - May, 2020
Advisers: Bow-Yaw Wang, Bo-Yin Yang

- Verify cryptographic programs
 - Design and implement a GCC plugin named GCC2CRYPTOLINE that translate GCC's intermediate representation – GIMPLE to CRYPTOLINE – DSL used to verify cryptographic programs.
 - Verify several functions in well-known industrial cryptographic libraries including OpenSSL, BoringSSL, NaCl, wolfSSL, and Bitcoin's libsecp256k1.
 - Found a bug in NaCl and reported it to the developer.
 - Present(Oral) the work at ACM CCS 2019 in London, UK. [5]
- Help certify bit blasting algorithm for SMT QFBV theory. [4]
- Help certify cryptoline verifier by Coq [2, 3].

Summer Research Intern Jul, 2018 - Aug, 2018
Adviser: Bow-Yaw Wang

- Design and implement a privacy protection system using Ethereum, IPFS, Python.
- Design and implement a web app used to interact with the Ethereum-based privacy protection system using MetaMask, React, JavaScript.

National Chiao Tung University Hsinchu, Taiwan
Undergraduate Research Feb, 2018 - Jan, 2019
Adviser: Shih-Kun Huang

- Survey AEG (automatic exploit generation) and angr.
- Employ angr and pwntools to implement a tiny AEG tool.
- Present in the final of undergraduate research competition.

PUBLICATIONS

autofz: Automated Fuzzer Composition at Runtime USENIX Security 2023
Yu-Fu Fu, Jaehyuk Lee, Taesoo Kim

Certified Verification for Algebraic Abstraction CAV 2023
Ming-Hsien Tsai, **Yu-Fu Fu**, Jiaxiang Liu, Xiaomu Shi, Bow-Yaw Wang, Bo-Yin Yang
International Conference on Computer-Aided Verification (AC rate: 26%)

CoqCryptoLine: A Verified Model Checker with Certified Results CAV 2023
Ming-Hsien Tsai, **Yu-Fu Fu**, Jiaxiang Liu, Xiaomu Shi, Bow-Yaw Wang, Bo-Yin Yang
International Conference on Computer-Aided Verification (AC rate: 26%)

CoqQFBV: A Scalable Certified SMT Quantifier-Free Bit-Vector Solver CAV 2021
Xiaomu Shi, **Yu-Fu Fu**, Jiaxiang Liu, Ming-Hsien Tsai, Bow-Yaw Wang, Bo-Yin Yang
International Conference on Computer-Aided Verification

Signed Cryptographic Program Verification with Typed CryptoLine CCS 2019
Yu-Fu Fu, Jiaxiang Liu, Xiaomu Shi, Ming-Hsien Tsai, Bow-Yaw Wang, Bo-Yin Yang
ACM Conference on Computer and Communications Security (AC rate: 16%)

GRANT AND
FUNDING

MetaFuzz: A Dynamic Approach to Schedule Existing Fuzzers for Better Performance
Agency/Company: Cisco
Total Dollar Amount: \$150,000
PI: Taesoo Kim
Research output: autofz [1]

SOFTWARE
ARTIFACTS

- autofz: Automated Fuzzer Composition at Runtime
<https://github.com/sslab-gatech/autofz>
- GCC2CRYPTOLINE: A tool translating GIMPLE to CRYPTOLINE
<https://github.com/fmlab-iis/gcc2cryptoline>
- CoqQFBV: a certified SMT QF_BV solver
<https://github.com/fmlab-iis/coq-qfbv>
- keepass-cli-rs: KeePass client written in Rust with Emacs integration
<https://github.com/fuyu0425/keepass-cli-rs>

HONORS AND
AWARDS
(SELECTED)

Academic Achievement
• **Academic Achievement Award** * 7 - NCTU CS Dept. Hsinchu, Taiwan
Awarded to Top 5% students in one semester. Awarded in **all** semesters.

Problem Solving & Capture The Flag Contest
• **Finalist 4th** in team StarBugs - DEFCON CTF 29 Final Las Vegas, USA
• **Finalist 12th** in team BFS - DEFCON CTF 26 Final Las Vegas, USA
• **Silver Medal** - ACM ICPC 2017 Asia Hua-Lien Regional Contest Hua-Lien, Taiwan
• **Honorable Mention** - ACM ICPC 2017 Asia Jakarta Regional Contest Jakarta, Indonesia
• **14th Place** – National Collegiate Programming Contest Taipei, Taiwan

TEACHING

CS6265: Information Security Lab Georgia Institute of Technology
Teaching Assistant 2021 Summer, 2022 Summer, 2023 Spring

SERVICES

Artifact Evaluation Committee
• Network and Distributed System Security Symposium (NDSS) 2024

External reviewer

- IEEE Symposium on Security and Privacy (Oakland) 2022
- Usenix Security Symposium (Security) 2022, 2023
- ACM Symposium on Operating Systems Principles (SOSP) 2021

EXTRACURRICULAR NCTU CS Computer Center

Hsinchu, Taiwan
Jul, 2017 - Jul, 2018

Teaching Assistant

- PC team: maintained computers in the department.
- BSD team: maintained FreeBSD workstations.
- WWW team: developed and maintained department websites.
- Helped students and faculties solve software and hardware problems.

NCTU Programming Competition Contest Association

Hsinchu, Taiwan
Feb, 2016 - Jul, 2018

Member

- Practiced for algorithm contests including national contests and ACM ICPC.
- Hold summer/winter camps targeting high school students.

NCTU Cyber Security Club

Hsinchu, Taiwan
Sep, 2016 - Jun, 2019

Network Administrator & Lecturer

- Taught web security about HTTP, XSS, CSRF.
- Maintained servers hosted at Linode.
- Attended CTFs in team Bamboofox.

TALKS

- ACM CCS 2019 London, United Kingdom

MEMBERSHIP

- **Member** - ACM
- **Student Member** - USENIX

COMPUTER SKILLS

- Languages: C/C++, Python, Rust, JavaScript, OCaml, shell script, basic SQL
- Proof Assistant: Coq
- Applications: Git, Docker, Vim, Emacs, \LaTeX
- Operating Systems: Linux, FreeBSD, macOS, Windows