Chang Min Park

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INTERESTS	End-to-End Image Security, Task Automation, UI Compatibility Testing, Automated Software Analysis, and Challenges in Mobile Systems.
TECHNICAL SKILLS	Android Internals and App Development, Bytecode Instrumentation Tools (Soot), ARM TrustZone, Google SafetyNet, AWS EC2/RDS, Java, Python, C, and Linux OS

EDUCATION

University at Buffalo, The State University of New York

- Ph.D. in Computer Science and Engineering — Aug '17 – Present
  - Advisor: Prof. Steven Y. Ko, Co-advisor: Prof. Karthik Dantu
- B.S. in Computer Science — Aug '11 – May '17
  - Magna Cum Laude
  - Jun '13 – Mar '15: Served Military Service in Republic of Korea

RESEARCH OVERVIEW

Through my undergraduate and graduate studies, my research has focused on mobile systems.

- **Crestone** [Under Submission] is an end-to-end system that protects image integrity when being shared across social media. The core functionality of Crestone is embedding signed hashes into raw pixels of an image as an invisible watermark and checking the integrity of whether the image has been tampered while being shared across different social media. By leveraging Google SafetyNet and digital certificates, our system protects an image acquisition path on an image producer's device and simplifies key sharing for integrity check.

- **Rushmore** [MobiSys '21] is a system that securely displays static or animated images using ARM TrustZone. The core functionality of Rushmore is to securely decrypt and display encrypted images from a trusted party on a mobile device. By leveraging IPU's multiple display channels and a fast stream cipher called ChaCha20, the system provides frame rates around or higher than 30 FPS for displaying encrypted animated images. Rushmore also enables a novel application of visual cryptogrpahy.
  Link: https://changminpark.github.io/rushmore

- **Gesto** [EICS '19, PACM-HCI, Best Paper Honorable Mention] is a system that enables task automation for Android apps using gestures and voice commands. Using this system, a user can record a UI action sequence for an app, choose a gesture or a voice command to activate the UI action sequence, and later trigger the UI action sequence by the corresponding gesture/voice command.
  Link: https://changminpark.github.io/gesto

- **Mimic** [ICSE '19] is an automated UI compatibility testing system for Android apps. Mimic is designed specifically for comparing the UI behavior of an app across different devices, different Android versions, and different app versions.
  Link: https://changminpark.github.io/mimic

- **Reptor** [MobiSys '17] enables open innovation in mobile platforms. Our technique allows third-party developers to modify, instrument, or extend platform API calls and deploy their modifications seamlessly. The uniqueness of our technique is that it enables modifications completely at the app layer without requiring any platform-level changes.
  Link: https://changminpark.github.io/reptor

RESEARCH EXPERIENCE

University at Buffalo, The State University of New York

- Ph.D. Research Assistant, RMS Lab — Aug '18 – Present
- Undergraduate Research Assistant, RMS Lab — May '16 – Aug '17

TEACHING EXPERIENCE

University at Buffalo, The State University of New York

- CSE486/586: Distributed Systems — Jan '20 – May '21
- CSE421/521: Operating Systems — Aug '17 – May '18

WORK EXPERIENCE

Breeding, Startup in South Korea

- CTO & Founding Member — May '20 – Jul '21
- The first non-face-to-face platform service that connects dog owners and trainers
- Designed an app service and a business model, *Link: https://changminpark.github.io/breeding*

PUBLICATIONS

PUBLISHED

[1] Chang Min Park, Donghwi Kim, Deepesh Veersen Sidhwani, Andrew Fuchs, Arnob Paul, Sung-Ju Lee, Karthik Dantu, and Stevn Y. Ko, "Rushmore: Securely Displaying Static and Animated Images Using TrustZone" in *Proceedings of the 19th Annual International Conference on Mobile Systems (MobiSys)*, *2021*.

[2] Chang Min Park, Taeyeon Ki, Ali Ben Ali, Nikhil Sunil Pawar, Karthik Dantu, Steven Y. Ko, and Lukasz Ziarek, "Gesto: Mapping UI Events to Gestures and Voice" in *Proceedings of 11th ACM SIGCHI Symposium on Engineering Interactive Computing Systems (EICS) and Journal Proceedings of the ACM on Human-Computer Interaction (PACM-HCI)*, *Jun 2019*. **Best Paper Honorable Mention**

[3] Taeyeon Ki, Chang Min Park, Karthik Dantu, Stevn Y. Ko, and Lukasz Ziarek, "Mimic: UI Compatibility Testing System for Android Apps" in *Proceedings of the 41st International Conference on Software Engineering (ICSE)*, *May 2019*.

[4] Taeyeon Ki, Alexander Simeonov, Bhavika Pravin Jain, Chang Min Park, Keshav Sharma, Karthik Dantu, Stevn Y. Ko, and Lukasz Ziarek, "Reptor: Enabling API Virtualization on Android for Platform Openness" in *Proceedings of the 15th Annual International Conference on Mobile Systems (MobiSys)*, *Jun 2017*.

SUBMITTED

[1] Chang Min Park, Karthik Dantu, and Stevn Y. Ko, "End-to-End Image Integrity through Crestone"

SELECTED POSTER

- Harishankar Vishwanathan, Chang Min Park, Sidharth Kumar Mishra, Karthik Dantu, Steven Y. Ko, and Lukasz Ziarek "Poster: Partitioning Garbage Collection Between the Secure and Normal Worlds for Trusted Applications" in *Proceedings of the 17th Annual International Conference on Mobile Systems (MobiSys)*, *Jun 2019*.

AWARDS AND GRANTS

- Excellence Award with $80,000 Grant in K-Startup Contest, *South Korea*   Nov 2020
- Top Award in Youth Startup Awards, *South Korea*   Oct 2020
- Pre-Startup Package with $50,000 Grant, *South Korea*   Sep 2020
- Second Place in CSE PhD Poster Competition, University at Buffalo   Dec 2019
- Best Paper Honorable Mention Award, *EICS*   Jun 2019
- SEAS Dean's Fellowship, University at Buffalo   2017
- CSE Undergraduate Award for Research, University at Buffalo   May 2017
- Dean's List, University at Buffalo   2012

REFERENCES

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