Chang Min Park

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INTERESTS

Secured Image Display using Trusted Execution Environment (TEE), Systems Challenges in Mobile Systems, Automated Software Analysis, and UI Testing.

TECHNICAL SKILLS

ARM TrustZone, Android Internals and App Development, Bytecode Instrumentation Tools (Soot), Firebase Realtime Database, 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
  - Focus: Systems Challenges in Mobile Computing
- B.S. in Computer Science — Aug '11 – May '17
  - Magna Cum Laude
  - Summer '12: Study Abroad Program at Yonsei University in Republic of Korea
  - Jun '13 – Mar '15: Served Military Service in Republic of Korea

Relevant Courses: Advanced Computer Systems, Advanced Programming Languages, Operating Systems, Distributed Systems, Realtime Embedded Systems, Modern Network Concepts, Data Intensive Computing, Computer Security, Algorithms Analysis & Design, VLSI Electronics, and Theory of Computation.

RESEARCH OVERVIEW

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

- **Rushmore** [Accepted to 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.
- **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: http://beyondthegeek.com/portfolio/gesto-eics-19/
- **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: http://beyondthegeek.com/portfolio/mimic-icse-19/
- **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: http://reptor.cse.buffalo.edu/

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 – Present
- CSE421/521: Operating Systems — Aug '17 – May '18

PUBLICATIONS

ACCEPTED

[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" accepted to *Proceedings of the 19th Annual International Conference on Mobile Systems* ***(MobiSys)*** *. 2021*

PUBLISHED

[1] 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**

[2] 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.*

[3] 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.*

POSTERS AND DEMOS

POSTERS

[1] 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.*

[2] Chang Min Park, Taeyeon Ki, Ali Ben Ali, Karthik Dantu, Steven Y. Ko, and Lukasz Ziarek, "Enabling Dynamic Gesture Mapping with UI Events" in *UB Graduate Research Conference and Alumni Symposium Sep 2017.*

DEMOS

[1] Chang Min Park, Taeyeon Ki, Karthik Dantu, Steven Y. Ko, and Lukasz Ziarek, "Demo: Enabling Dynamic Gesture Mapping with UI Events" in *Proceedings of the 15th Annual International Conference on Mobile Systems **(MobiSys)** Jun 2017.*

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

[3] Taeyeon Ki, Alexander Simeonov, Chang Min Park, Karthik Dantu, Steven Y. Ko, and Lukasz Ziarek, "Demo: Fully Automated UI Testing System for Large-scale Android Apps Using Multiple Devices" in *Proceedings of the 15th Annual International Conference on Mobile Systems **(MobiSys)** Jun 2017.*

HONORS & AWARDS

- Best Paper Honorable Mention Award — Jun 2019
- UB SEAS Dean's Fellowship — 2017
- CSE Undergraduate Award for Research, University at Buffalo — May 2017
- Dean's List, University at Buffalo — 2012

REFERENCES

Steven Y. Ko
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University at Buffalo, State University of New York and Simon Fraser University
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