Chang Min Park

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INTERESTS

End Device Security, Task Automation, UI Compatibility Testing, Automated Software Analysis, and Other Various Challenges in Mobile Systems.

TECHNICAL SKILLS

Android Internals and App Development, Bytecode Instrumentation Tools (Soot), ARM TrustZone, Google SafetyNet, AWS EC2/RDS, Figma, 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 – Jan ‘23
- B.S. in Computer Science, *Magna Cum Laude* — Aug ‘11 – May ‘17
  - Jun ‘13 – Mar ‘15: Served Military Service in South Korea

EXPERIENCE

Software Engineer II, Yahoo — Feb ‘23 – Present

- Design and build features of Yahoo Mail for Android.

CTO & Founding Member, Breeding (Startup in South Korea) — 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.

Teaching Assistant, University at Buffalo, The State University of New York — Aug ‘17 – May ‘21

- Distributed Systems and Operating Systems

SELECTED PROJECTS

End-to-End System Protecting Integrity of Images Across Social Media (in Progress)

- Implemented a system embedding an invisible hash watermark into raw pixels, checking whether the image has been tampered in the middle, and recovering the tampered areas using error-correction code.
- Leveraged (1) Google SafetyNet to protect an image acquisition path on an image producer’s device and (2) digital certificates to simplify key sharing for integrity check.

Securely Displaying Static and Animated Images Using TrustZone (Published in MobiSys ‘21)

- Implemented a system protecting image display from the compromised OS using ARM TrustZone.
- Leveraged (1) IPU’s multiple display channels to enable simultaneous displaying from both untrusted and trusted domains, (2) ChaCha20, a fast stream cipher, to provide frame rates around or higher than 30 FPS, and (3) visual cryptography to provide an alternative to regular cryptography.

Mapping UI Events to Gestures and Voice Commands (Published in EICS ‘19, PACMHCI, Best Paper)

- Implemented a system enabling task automation for Android apps with gestures and voice commands.
- Leveraged (1) bytecode instrumentation tool to analyze an app and to inject functionality without the need for source code and (2) UI record-and-replay technique to record a sequence of UI actions and later replay it with a mapped gesture or voice command.

UI Compatibility Testing System for Android Apps (Published in ICSE ‘19)

- Implemented a system automatically comparing the UI behavior of an app across different devices, different Android versions, and different app versions.
- Detected various forward and backward compatibility issues on thousands of apps on Google Play in a short period of time by building a parallel testing strategy and a programming model for scripting it.

Enabling API Virtualization on Android for Platform Openness (Published in MobiSys ‘17)

- Implemented a system allowing third-party developers to modify, instrument, or extend platform API calls and deploy their modifications seamlessly.
- Leveraged bytecode instrumentation tool to enables modifications completely at the app layer without requiring any platform-level changes.

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
- 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