Resume

Unsung Lee

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Education

2012 - Present	**Ph.D in Computer Science and Engineering (CSE)**	**POSTECH**
	System Software Laboratory (Advisor: Prof. Chanik Park).	
2008 - 2012	**B.S. in Computer Science and Engineering (CSE)**	**POSTECH**

Employment

Apr. 2016 – Aug. 2017	Visiting assistant in research (VAR), collaboration	**Yale University**

Scholarships

Mar. 2016 – Dec. 2016	**BK21** plus department of Computer Science and Engineering, Republic of Korea Living expenses + Travel expenses
Mar. 2016 – Aug. 2017	**Yale Flint Group,** CT, USA Living expenses + Tuition + Health care

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Research Interests

- System Software
- Virtualization
- Embedded System
- System Security

Publications

2020 **Unsung Lee** and Chanik Park, “SofTEE: Software-Based Trusted Execution Environment for User Applications,” IEEE Access 8: 121874-121888.

2018 Mirae Lim, **Unsung Lee**, and Chanik Park, “Verifying the integrity of sensing data through hardware TPM (Korean: 하드웨어 TPM을 이용한 센서 데이터 무결성 증명),” KCC.

2017 Sejin Park, Byungsu Park, **Unsung Lee,** and Chanik Park, “Virtualizing Graphics Architecture of Android Mobile Platforms in KVM/ARM Environment,” IEICE Trans. Inf. Syst. 100-D(7): 1403-1415.

2014 Byungsu Park, **Unsung Lee**, Sejin Park, Chanik Park, Woosung Kim, Hyejin Cho, and Gyueun Lee, “Driving GPU devices in Android plat m through KVM/ARM (Korean: 안드로이드 호스트 기반 KVM/ARM 가상화 환경에서의 GPU 디바이스 구동기법),” KCC.

Research Projects

Apr. 2017 – Dec. 2018 **Developing high performance/high reliability blockchain for decentralized autonomous IoT platform**

- Analyzed existing Trusted Execution Environment (TEE) solutions (e.g., ARM TrustZone and Intel SGX)
- Supported software-based TEE for IoT devices
- Developed a software TPM called kernel-based TPM (a.k.a. kTPM)

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Apr. 2016 – Aug. 2017 **To develop CertiKOS for ARM platform first and to extend CertiKOS for GPU device**

- Supported CertiKOS on multi-core environment.
- Developed CertiKOS hypervisor for ARM platform.

Mar. 2015 – Feb. 2017 **Supporting dual OSes (high reliability OS/high performance OS) simultaneously in multi-core environments**

- Supported u-hypervisor on multi-core environment.
- Supported device drivers to run a RTOS on NVIDIA-TK1 board (multi-core environment).
- Supported RTOS and Linux kernel simultaneously using u-hypervisor.
- Supported GPU device sharing between dual OS (RTOS and Linux kernel)

Aug. 2013 – July. 2014 **Development of 2D/3D Virtualization technology for multiple Guest OSes based on virtualized environment.**

- Analyzed Android graphics internal
  - Android Hardware Abstraction Layer (HAL): HWComposer and Gralloc
  - Linux device driver: vsync, display driver, fence, GPU driver, ION driver (display buffer manager)
- Supported graphics sharing between two different Android OSes in KVM/ARM environment.

Programming Skills

- **Languages**
  - **Expert** C/C++, Bash, ARM assembly
  - **Familiar** Python
- **Hardware Platform**
  - **Expert** ARM platform(ARMv6, ARMv7, ARMv8, and ARM FastModels)
  - **Familiar** Intel x86

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- **Operating Systems**
  - **Expert** Linux kernel-based OS (e.g., Android and mobile Ubuntu)
  - **Familiar** RTOS
- **Software Tool**
  - **Expert** KVM/Qemu, Trusted Platform Module (TPM)
  - **Familiar** Debugging tool (GDB, Trace32)

Teaching Experience

- Teaching Assistant
  - Operating Systems (CSED312), Fall 2013
  - Digital System Design (CSED273), Spring 2014