DAE R. JEONG (정대룡)

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RESEARCH INTERESTS

I'm interested in improving the reliability and security of system softwares such as operating systems, hypervisors, and mobile platforms. Specifically, my research topics include:

- **Automating vulnerability detection**
- **Reproducing and diagnosing failures in large system softwares**
- **Analyzing concurrent and parallel execution**
- **Hardening system softwares**

EDUCATION

B.S. in School of Computing, KAIST ***Mar. 2010 - Feb. 2014***

M.S. in School of Computing KAIST ***Mar. 2014 - Feb. 2016***
Advisor*: *Insik Shin

Ph.D in School of Computing, KAIST ***Mar. 2016 - Feb. 2023***
Advisor*: *Insik Shin
Thesis*: *Finding and Diagnosing Concurrency Bugs in a Kernel through Systematic Instruction Scheduling

- **Outstanding dissertation award**

PUBLICATIONS

International Conferences

1. **Mixmax: Leveraging heterogeneous batteries to alleviate low battery experience for mobile users (to appear), 2023**
   Jaeheon Kwak, Sunjae Lee, **Dae R. Jeong**, Arjun Kumar, Dongjae Shin, Ilju Kim, Donghwa Shin, Kilho Lee, Jinkyu Lee, and Insik Shin
   Proceedings of the 21st ACM International Conference on Mobile Computing Systems (***MobiSys***).

2. **SegFuzz: Segmentizing thread interleaving to discover kernel concurrency bugs through fuzzing (to appear), 2023**
   Dae R. Jeong, Byoungyoung Lee, Insik Shin, and Youngjin Kwon
   Proceedings of the 44th IEEE Symposium on Security and Privacy (***Oakland***).

3. **Diagnosing kernel concurrency failures with AITIA (to appear), 2023**
   Dae R. Jeong, Minkyu Jung, Yoochan Lee, Byoungyoung Lee, Insik Shin, and Youngjin Kwon
   Proceedings of the 18th European Conference on Computer Systems (***EuroSys***).

4. **HFL: Hybrid fuzzing on the linux kernel, 2020**
   Kyungtae Kim, **Dae R. Jeong**, Chung Hwan Kim, Yeongjin Jang, Insik Shin, and Byoungyoung Lee

Proceedings of the 2020 Annual Network and Distributed System Security Symposium (***NDSS***).

5. **Fluid: Multi-device mobile platform for flexible user interface distribution, 2019**
   Sangeun Oh, Ahyeon Kim, Sunjae Lee, Kilho Lee, **Dae R. Jeong**, Steven Y Ko, and Insik Shin
   Proceedings of the 25th ACM Annual International Conference on Mobile Computing and Networking (***MobiCom***).

6. **Light-weight novel view synthesis for casual multiview photography (Oral), 2019**
   Inchang Choi, Yeong Beum Lee, **Dae R. Jeong**, Insik Shin, and Min H Kim
   14th International Symposium on Visual Computing (***ISVC***).

7. **Razzer: Finding kernel race bugs through fuzzing, 2019**
   Dae R. Jeong, Kyungtae Kim, Basavesh Shivakumar, Byoungyoung Lee, and Insik Shin
   Proceedings of the 40th IEEE Symposium on Security and Privacy (***Oakland***).

8. **Mobile plus: Multi-device mobile platform for cross-device functionality sharing, 2017**
   Sangeun Oh, Hyuck Yoo, **Dae R. Jeong**, Duc Hoang Bui, and Insik Shin
   Proceedings of the 15th ACM International Conference on Mobile Computing Systems (***MobiSys***).

9. **Mobile platform design for sharing functionalities between multiple devices, 2017**
   Sangeun Oh, Hyuck Yoo, **Dae R. Jeong**, Duc Hoang Bui, and Insik Shin
   Proceedings of the 18th IEEE International Conference on Mobile Data Management (***MDM***).

Workshop & Miscellaneous

1. **New cpu load classification method for device-agnostic mobile power consumption prediction model, 2022**
   Kwangho Kim, Sera Lee, **Dae R. Jeong**, and Insik Shin
   Korean Institute of Information Scientists and Engineers.

2. **MoBaP: Mobile battery prediction framework for video streaming, 2021**
   Sera Lee, **Dae R. Jeong**, and Insik Shin
   Korean Institute of Information Scientists and Engineers.

3. **Mobile Plus: Mobile platform for Transparent Sharing of Functionalities Across Devices (Poster), 2016**
   Sangeun Oh, Hyuck Yoo, **Dae R. Jeong**, Sooyoung Park, Duc Hoang Bui, Sungsoo Moon, and Insik Shin
   Poster at the 14th ACM International Conference on Mobile Computing Systems (***MobiSys***).

4. **GPGPU Parallelization Techniques for Redundancy Elimination Algorithm, 2014**
   Byunggil Joe, **Dae R. Jeong**, Jiyeon Lee, and Insik Shin
   Korean Institute of Information Scientists and Engineers.

OPEN SOURCE CONTRIBUTION

- **SegFuzz: A kernel fuzzer utilizing interleaving coverage to discover concurrency bugs** ***Will be released***
- **Linux: Reported and fixed concurrency bugs in various subsystems, Contributor**
  https://git.kernel.org/pub/scm/linux/kernel/git/torvalds/linux.git/
- **Razzer: A kernel fuzzer focusing on concurrency bugs**
  https://github.com/compsec-snu/razzer

HONORS AND AWARDS

- **Outstanding Dissertation Award, 2023**
  School of Computing, KAIST
  Finding and Diagnosing Concurrency Bugs in a Kernel through Systematic Instruction Scheduling
- **Best Paper Award, 2021**
  Korea Institute of Information Scientists and Engineers (한국정보과학회)
  ***MoBaP*: *Mobile Battery Prediction Framework for Video Streaming*,**
- **Best Paper Award, 2019**
  ACM International Conference on Mobile Computing and Networking (MobiCom)
  FLUID*: *Multi-device Mobile Platform for Flexible User Interface Distribution
- **Naver Ph.D Fellowship Award, 2019**
- **Second prize (우수상), 2015**
  E*5 LabStartup KAIST
  Team LeviOsa
- **Undergraduate Student Best Paper Award, 2015**
  Korea Institute of Information Scientists and Engineers (한국정보과학회)
  GPGPU Parallelization Techniques for Redundancy Elimination Algorithm

EXPERIENCE

- **Professional Activities**

  Shadow PC (2023) - EuroSys
- **Head Teaching Assistant**

  Operating System and Lab (CS330) **Fall 2019, Spring 2017**
- **Teaching Assistant**

  Operating System and Lab (CS330) **Spring 2018, Spring 2016, Spring 2015, Spring 2014**
  Operating System (CS530) **Fall 2017**

PATENTS

- **무인비행체 조종 방법, 이를 구현하기 위한 프로그램이 저장된 기록매체 및 이를 구현하기 위해 매체에 저장된 컴퓨터프로그램, 1020180052585 (2018.05.08)**
  METHOD FOR CONTROLING UNMANNED FLYING OBJECT AND RECORDING MEDIUM STORING PROGRAM FOR EXECUTING THE SAME, AND RECORDING MEDIUM STORING PROGRAM FOR EXECUTING THE SAME
- **원통좌표계 기반 무인이동체 조종 방법, 이를 구현하기 위한 프로그램이 저장된 기록매체 및 이를 구현하기 위해 매체에 저장된 컴퓨터프로그램, 1020180052598 (2018.05.08)**
  METHOD FOR CONTROLING UNMANNED MOVING OBJECT BASED ON CYLINDRICAL COORDINATE SYSTEM AND RECORDING MEDIUM STORING PROGRAM FOR EXECUTING THE SAME, AND COMPUTER PROGRAOM STORED IN RECORDING MEDIUM FOR EXECUTING THE SAME
- **어플리케이션 수행에 있어서 모바일 기기 간에 기능을 분배하는 방법, 1020170089910 (2017.07.14)**
  METHOD FOR CROSS-DEVICE FUNCTIONALITY SHARING

SKILLS

Computer Languages	**C, C++, Golang, Python, Java, JavaScript, Haskell, Shell script**
Software Knowledge	**Linux, Syzkaller, QEMU/KVM, LLVM, SVF**
Languages	**Korean (first language), English**