Jiwon Kim

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https://kjw6855.github.io

Research Interests

Security for next-generation networks, software-defined networking, intent-based networking, and programmable networking

Education

Aug 2020 - *Current*	**Purdue University**, West Lafayette, IN, USA Ph.D in Computer Science Major: *Security for Next-Generation Networks* | Advisor: Prof. Dave (Jing) Tian
Mar 2015 - Aug 2016	**Sungkyunkwan University**, Suwon, Republic of Korea Master of Science in Platform Software Major: *System Software for Non-Volatile Memory* | Advisor: Prof. Hwansoo Han
Mar 2011 - Feb 2015	**Sungkyunkwan University**, Suwon, Republic of Korea Bachelor of Science in Software Engineering

Publications

[1] **"Intender: Fuzzing Intent-Based Networking with Intent-State Transition Guidance"**
<u>**Jiwon Kim**</u>, Benjamin E. Ujcich, Dave (Jing) Tian.
USENIX Security Symposium (Security '23), Aug 2023.

[2] **"Efficient Memory Mapped File I/O for In-Memory File Systems"**
Jungsik Choi, <u>**Jiwon Kim**</u>, Hwansoo Han.
USENIX Workshop on Hot Topics in Storage and File Systems (HotStorage '17), Jul. 2017.

[3] **"In-Memory File System with Efficient Swap Support for Mobile Smart Devices"**
Jungsik Choi, Joonwook Ahn, <u>**Jiwon Kim**</u>, Sungtae Ryu, Hwansoo Han.
IEEE Transactions on Consumer Electronics, vol. 62(3), pp. 275-282, Aug. 2016.

Research Experience

Aug 2020 - *Current*	PURSEC Lab, **Purdue University**, West Lafayette, IN, USA *Research Assistant* - Advisor: Prof. Dave (Jing) Tian • Participated in fuzzing intent-based networks project • Participated in projects on system security for software-defined networks
Mar 2014 - Oct 2016	ARCS Lab, **Sungkyunkwan University**, Suwon, Republic of Korea *Research Assistant* - Advisor: Prof. Hwansoo Han • Participated in projects on system software for non-volatile memory
Aug 2013 - Feb 2014	M2M Lab, **Purdue University**, West Lafayette, IN, USA *Research Intern* - NIPA-Purdue Capstone Project - Advisor: Prof. Eric Matson • Designed and developed road guidance system for visually impaired with Arduino and Android application
Mar 2012 - Jan 2013	**Sungkyunkwan University**, Suwon, Republic of Korea *Co-op Research Assistant* - Cooperative Project with AhnLab - Advisor: Prof. Jee-Hyong Lee • Analyzed existing thesis and source code on high-performance packet classification for Netfilter

Professional Experience

Sep 2016 - Jul 2020	**ATTO Research**, Seoul, Republic of Korea *Research Engineer* • Created flow-specific database for concurrent and consistent software-defined network updates • Designed and developed SDN applications to manage underlay/overlay networks in private cloud • Developed secure SDN controller cluster with TLS, RBAC, and flow monitoring • Implemented domain-specific language and command-line interface for SDN controller
Jan 2013 - Feb 2013	**Acryl Inc.**, Seoul, Republic of Korea *Intern* • Developed prototype of Android messenger application
Feb 2012	**Hancom corp.**, Seongnam, Republic of Korea *Intern* • Participated in quality assurance team

Patents

US   Jungsik Choi, Hwansoo Han, <u>Jiwon Kim</u>, "Memory mapping management method for nonvolatile main memory system," US Patent 10,185,654, 2019.

KR   <u>Jiwon Kim</u>, Jaekyun Shim, Hyunwoo Park, Yongjoo Song, "Method, apparatus and computer program for processing flow rule transactions in software defined network," KR 10-2275765, 2021.

<u>Jiwon Kim</u>, Jaekyun Shim, Yongjoo Song, Jonghyun Kwon, "Method, apparatus and computer program for operating the flow rules database in software defined network," KR 10-2226915, 2021.

<u>Jiwon Kim</u>, Yongjoo Song, "Method, apparatus and computer program for supporting distributed snat in a cloud environment in a software defined network," KR 10-2200402, 2021.

<u>Jiwon Kim</u>, Jaekyun Shim, Yongjoo Song, "Methods, apparatus and computer programs for providing high availability and reliability in software defined network," KR 10-2092091, 2020.

Yongjoo Song, <u>Jiwon Kim</u>, "Method, apparatus and computer program for tracking traffic using software defined networking," KR 10-2066555, 2020.

Hyunwoo Park, <u>Jiwon Kim</u>, Inwook Hwang, Jaeho Kim, Beomsoo Park, Yongjoo Song, "Method and computer program for handling trouble using packet-out message in software defined networking environment," KR 10-1969304, 2019.

<u>Jiwon Kim</u>, Hyunwoo Park, Inwook Hwang, Jaewoong Chung, "Method, apparatus and computer program for defending software defined network," KR 10-1932656, 2018.

Hyunwoo Park, <u>Jiwon Kim</u>, Inwook Hwang, Jaeho Kim, Beomsoo Park, Yongjoo Song, "Method and computer program for handling trouble using flow-mod message in software defined networking environment," KR 10-1931543, 2018.

<u>Jiwon Kim</u>, Inwook Hwang, Yongjoo Song, "Method, apparatus, and computer program for verifying host status information in a software defined network," KR 10-1931139, 2018.

Hwansoo Han, Jungsik Choi, <u>Jiwon Kim</u>, "Method for atomic update of memory mapped files stored in non-volatile memory and control apparatus thereof," KR 10-1881038, 2018.

Academic Services

Technical Program Committee

• IEEE Workshop on the Internet of Safe Things (**SafeThings**): 2023

External Reviewer

• International Symposium on Research in Attacks, Intrusions, and Defenses (**RAID**): 2023

Teaching Experience

Mar 2015 - Oct 2016	**Sungkyunkwan University**, Suwon, Republic of Korea *Teaching Assistant* • SWE2013 - Software Creative Project (Spring 2016) • SWE3010 - Compiler Design (Fall 2015) • ICE2002 - Data Structures (Fall 2015) • GEDB029 - Basis and Practice in Programming (Spring 2015)

Scholarships

Aug 2020 - Aug 2024	Ross Fellowship, Purdue University
Mar 2016 - Aug 2016	Simsan Scholarship, Sungkyunkwan University
Mar 2015 - Aug 2016	Masters and Doctors Connected Track Scholarship, Sungkyunkwan University
Mar 2011 - Feb 2015	National Science & Technology Scholarship, Korea Student Aid Foundation

Honors and Awards

Aug 2018	Hall of Fame, Atto Research
Dec 2015	Outstanding Paper Award, Korea Institute of Information Scientists and Engineers
Apr 2013	Dean's List, Sungkyunkwan University
Oct 2012	Dean's List, Sungkyunkwan University