

KYONG TAK CHO

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PROFESSIONAL PROJECTS

Identifying Who's Driving via Vehicle Motion Tracking

- Proposed a scheme which exploits sensor measurements during vehicle turns in identifying *who* is driving.
- Identifies the driver with accuracies of 95.3%, 95.4%, and 96.6% across 12, 8, and 5 drivers, respectively.

Forensic Method for Vehicle Cyber Attacks [CCS'17]

- Proposed a scheme that can identify the attacker ECU with a low false identification rate of 0.2%.
- Demonstrated its efficiency in a CAN bus prototype and in two real vehicles via CAN data analysis.

Discovery of a New Attack Model in In-vehicle Networks [CCS'16] — Covered by Motherboard

- Discovered a new type of Denial-of-Service attack which can shut down ECUs or the whole in-vehicle network.
- Demonstrated its feasibility and its severe consequences in two real vehicles.

Fingerprinting In-vehicle ECUs for Intrusion Detection [Sec'16] — Covered by Wired, eWeek

- Proposed a new Intrusion Detection System which can fingerprint ECUs based on extracted clock skews and thus significantly outperforms state-of-the-art schemes.
- Achieved a low false-positive rate of 0.055% in detecting intrusions thanks to the new fingerprinting scheme.

Sensing Vehicle Steering via Smartphone [MobiSys'15]

- Developed a mobile application which fuses smartphone sensors to detect various types of driving patterns.
- Achieved 100% and 97% accuracies in detecting left/right turns and lane changes, respectively.

Checking Norm Operation of a Brake-by-Wire System [ICCPS'15]

- Proposed a new scheme which detects various abnormal brake operations (e.g., unintended acceleration).
- Demonstrated its accurate detection via CarSim simulation.

INTERESTS & SKILLS

Interests: Embedded Systems, Vehicle Motion Tracking, Automotive Security, Apps for Vehicle Assistance

Familiar With: IMUs, CAN, CAN-FD, Automotive ECUs, Vector CANoe, CarSim, Arduino Programming

Programming Language: C/C++, Java, Python, MATLAB

Operating System: Windows, Linux, Android

EMPLOYMENT

Ford Research and Innovation Center

Cybersecurity Research Intern, Ford Silicon Valley Lab

Palo Alto, CA

Jun. 2017–Aug. 2017

Intel

Automotive Security Intern, Emerging Security Lab

Hillsboro, OR

May. 2016–Aug. 2016

ETRI (Electronics and Telecommunications Research Institute)

Research Engineer, 3GPP RAN3 Standardization Delegate

Daejeon, Korea

Feb. 2010–Mar. 2013

EDUCATION

University of Michigan, Ann Arbor

Ph.D in Computer Science & Engineering advised by Prof. Kang Shin

Ann Arbor, MI
Sep. 2013–Apr. 2018
(expected)

Seoul National University

M.S. in Electrical Engineering and Computer Science

Seoul, Korea
Feb. 2010

Yonsei University

B.S. in Electronic and Electrical Engineering (*Magna Cum Laude*)

Seoul, Korea
Feb. 2008

ACADEMIC PUBLICATIONS

1. **Kyong-Tak Cho** and Kang G. Shin, “Viden: Attacker Identification on In-Vehicle Networks,” *Proc. 24th ACM Conference on Computer and Communications Security (CCS’17)*, Oct. 2017.
(Acceptance rate: $151/843 = 17.9\%$)
2. **Kyong-Tak Cho** and Kang G. Shin, “Error Handling of In-vehicle Networks Makes Them Vulnerable,” *Proc. 23rd ACM Conference on Computer and Communications Security (CCS’16)*, Oct. 2016.
(Acceptance rate: $137/837 = 16.4\%$)
3. **Kyong-Tak Cho** and Kang G. Shin, “Fingerprinting Electronic Control Units for Vehicle Intrusion Detection,” *Proc. 25th USENIX Security Symposium (Sec’16)*, Aug. 2016.
(Acceptance rate: $72/467 = 15.4\%$)
4. Dongyao Chen, **Kyong-Tak Cho**, Sihui Han, and Kang G. Shin, “Invisible Sensing of Vehicle Steering with Smartphones,” *Proc. 13th ACM Mobisys’15*, May 2015.
(Acceptance rate: $29/219 = 13.2\%$)
5. **Kyong-Tak Cho**, Taejoon Park, and Kang G. Shin, “CPS Approach to Checking Norm Operation of a Brake-by-Wire System,” *Proc. 6th ACM/IEEE ICCPS’15*, Apr. 2015.
(Acceptance rate: $25/91 = 27.4\%$)

AWARDS & HONORS

ACM CCS Student Travel Grant

ACM CCS

2016, 2017

USENIX Security Student Travel Grant

USENIX

2016

Rackham Conference Travel Grant

University of Michigan

2015, 2016, 2017

Distinguished Dissertation Award

Seoul National University

Feb. 2010

Best Paper Award

JCCI

Apr. 2009

Graduate Magna Cum Laude with High Honors

Yonsei University

Feb. 2008

Academic Excellence Award with High Honors

Yonsei University

2005