KYONG-TAK CHO

University of Michigan, Ann Arbor | Ph.D Candidate

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PROFESSIONAL PROJECTS

Identifying the Driver Within One Turn Using Smartphone Inertial Sensors
- Proposed a scheme which identifies *who* is driving the vehicle via smartphone sensors and machine classifiers.
- 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 — Palo Alto, CA
Cybersecurity Research Intern, Ford Silicon Valley Lab — Jun. 2017–Aug. 2017

Intel — Hillsboro, OR
Automotive Security Intern, Emerging Security Lab — May. 2016–Aug. 2016

ETRI (Electronics and Telecommunications Research Institute) — Daejeon, Korea
Research Engineer, 3GPP RAN3 Standardization Delegate — Feb. 2010–Mar. 2013

EDUCATION

University of Michigan, Ann Arbor — Ann Arbor, MI
Ph.D in Computer Science & Engineering advised by Prof. Kang Shin — Sep. 2013–Apr. 2018 (expected)

Seoul National University — Seoul, Korea
M.S. in Electrical Engineering and Computer Science — Feb. 2010

Yonsei University — Seoul, Korea
B.S. in Electronic and Electrical Engineering (*Magna Cum Laude)* — Feb. 2008

ACADEMIC PUBLICATIONS

1. **Kyong-Tak Cho** and Kang G. Shin, "Viden: Attacker Identification on In-Vehicle Networks (to appear)," *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 — 2016, 2017
ACM CCS

USENIX Security Student Travel Grant — 2016
USENIX

Rackham Conference Travel Grant — 2015, 2016, 2017
University of Michigan

Distinguished Dissertation Award — Feb. 2010
Seoul National University

Best Paper Award — Apr. 2009
JCCI

Graduate Magna Cum Laude with High Honors — Feb. 2008
Yonsei University

Academic Excellence Award with High Honors — 2005
Yonsei University