



Department of Computer Science

Defeating Cyber and Physical Attacks in Robotic Vehicles

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Hosted by Cong Shi

DATE: Friday, January 19, 2024

TIME: 11:00 AM – 12:00 PM

Location: GITC 4402 (4th floor Seminar Lecture Hall)

Webex Link: <https://njit.webex.com/njit/j.php?MTID=m405a630703ef552584927985af4ba84b>

Abstract:

The use of robotic vehicles (RVs) is increasing dramatically. Indeed, RVs are used in a wide range of real-world scenarios, such as submarines under the ocean, sailboats on the water, rovers on the ground, and drones in the air. However, two primary threats significantly increase the risk of physical damage to RVs: (1) logic bugs causing deviations in an RV's physical behavior from the developer's expectations; and (2) physical sensor attacks—such as GPS spoofing and acoustic noise injection—that disturb an RV's sensor readings.

In this talk, I will introduce a recent line of efforts to defeat logic bugs and physical sensor attacks in RV control software and the lessons learned from those efforts. In particular, I will focus on discussing algorithms to discover logic bugs, help developers fix them, and test the correctness of the patches attempting to address them. Next, I will discuss the challenges of reproducing sensor attacks and the fundamental reasons for successful sensor attacks.

Bio:

Hyungsub Kim is a postdoctoral researcher at Purdue University, working with Prof. Dongyan Xu. He obtained his Ph.D. from Purdue University in December 2023, co-advised by Prof. Dongyan Xu, Prof. Antonio Bianchi, and Prof. Z. Berkay Celik. His main research interest is defeating security threats against computer systems using program analysis techniques. His research efforts have been recognized by being selected as CPS Rising Stars from cyber-physical systems virtual organization (CPS-VO) funded by NSF.

WebEx information

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Friday, January 19, 2024 11:00 AM | 1 hour | (UTC-05:00) Eastern Time (US & Canada)

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