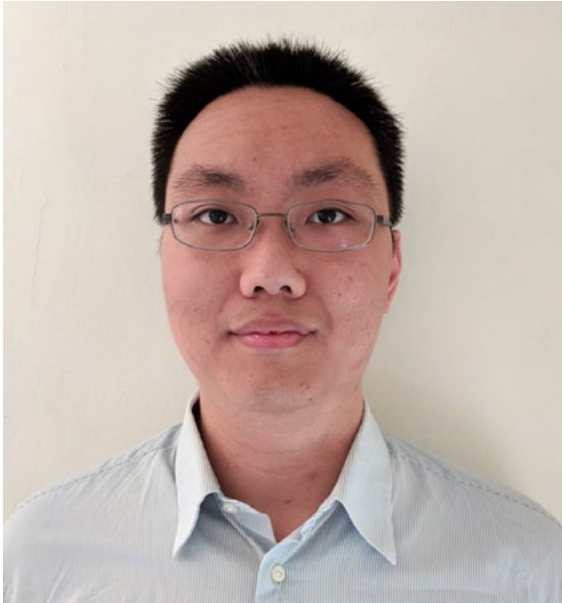




DISSERTATION DEFENSE



CHUN-YU CHEN

Context-Aware Detection and Resolution of Data Anomalies for Semi-Autonomous Cyber-Physical Systems

Tuesday, April 12, 2022

2:30pm – 4:30pm

[Virtual](#)

ABSTRACT: A cyber-physical system (CPS) with both autonomous and manual control capabilities, or a semi-autonomous (SA) CPS/system, is one of the most commonly seen types of system in our daily lives, such as cars, airplanes and ships. While having the benefits of autonomous control to enhance safety/comfort of transportation and the flexibility of manual control to handle safety-critical situations, SA systems inevitably inherit the vulnerabilities embedded in both control types. That is, an SA system will also suffer from component failures or design/software bugs (e.g., crashes of Boeing 737 MAX) and potential attacks (e.g., sensor spoofing) as a general CPS does. Moreover, since mechanical components are gradually being replaced by their electronic counterparts in SA systems, this trend also introduces new reliability and security risks --- increasing adoption of multiple heterogeneous communication interfaces widens attack surfaces that an adversary can exploit. Considering the potential security and safety concerns caused by system faults/flaws, human error, and malicious attacks, we develop a suite of mechanisms/systems for detection and resolution of system anomalies by cross-validating the sensor data and the context information to enhance the security and safety of SA systems from three key perspectives that can directly influence the operation of SA systems --- system operation, received information, and control decisions.

CHAIR: Prof. Kang Shin