Sensors are designed to measure sensor inputs (e.g., physical quantities) and transfer sensor outputs (e.g. voltage signal) into the embedded devices. In addition, sensor-equipped embedded systems (called sensing-and-actuation systems) decide their actuations according to these sensor outputs, and the systems have no doubt whether the sensor outputs are legitimate or not. Sensors are essential components for safety-critical systems such as self-driving cars, drones and medical devices. Breaking safety in these systems may cause loss of life or disasters. Because of these safety reasons, sensors are often designed to be robust against failure or faults. However, can they maintain safety under adversarial conditions? In this talk, I detail how sensors can be spoofed or prevented from providing correct operation through regular and side-channels. Attacks on various devices such as medical devices, drones, and self-driving cars will be shown. I'll complete the talk with a few directions and guides to prevent these attacks with a few open problems.

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Hosted by: Dr. Aziz Mohaisen