Connor Bolton

Embedded Systems and Cyber-physical Security Researcher

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Education

University of Michigan — *Ann Arbor, Michigan*

PhD in Computer Science — *2016 - Present*

Clemson University — *Clemson, South Carolina*

B.S. in Computer Engineering — *2010 - 2015*

Minor in Foreign Language: Japanese

Selected Publications

Connor Bolton, Chen Yan, Hocheol Shin, Kevin Fu, Wenyuan Xu, Yongdae Kim, **"SoK: A Minimalist Approach To Formalizing Analog Sensor Security"**, IEEE S&P (Oakland), May 2020

Connor Bolton, Sara Rampazzi, ChaoHao Li, Andrew Kwong, Wenyuan Xu, Kevin Fu, **"Blue Note: How Intentional Acoustic Interference Damages Availability and Integrity in Hard Drives and Operating Systems"**, IEEE S&P (Oakland), May 2018.

Nicole Tobias, Connor Bolton, Josiah Hester, Lanny Sitanayah, Jacob Sorber, **"Shoulder Angel: An Open Platform for Reprogramming Wayward Wireless Sensors"**, IEEE Embedded Systems Letters, Sep. 2016

Relevant Research Experience

Graduate Research Assistant — *University of Michigan*

Cyber-physical Sensor Security. Research includes: — *2016 - Present*

- Characterizing attacks that manipulate sensor output via acoustics, electromagnetic waves, lasers, and more
- Investigating how defenses for cyber-physical attacks on sensors may be employed across different sensing modalities
- Predicting future Internet-of-Things attack scenarios, including attacks using hundreds of heterogeneous sensors

Undergraduate Research Assistant — *Clemson University*

Ultra-low-power Wireless Sensor Networks. Research includes: — *2015-2016*

- Investigating battery-less sensing networks and how improve intermittent computing
- Developing a co-processor technique to detect and recover from fatal errors in deployed sensing devices
- Designing and deploying sea-otter movement tracking devices off the California coast

Applicable Technical Skills

Technical Writing (see above papers)

Software

- Embedded Programming and Equipment Interfacing
  - Created several sensor and radio drivers in C and C++ for MSP430 and ATMEL microcontrollers
  - Developed test setups in Python and C that interface with oscilloscope, function generator, and sensors simultaneously
- Android - Built applications in Java to collect experimental data, typically from smart-phone sensors
- Machine Learning - Designed supervised learning and neural network models to extract sensitive information from sensor data

Hardware

- PCB and Circuit Design - Drafted and implemented several PCB and circuit designs. These designs often include microcontrollers, interfaces (including custom radio and antennas), and sensors
- Basic wiring, soldering, and other embedded systems practical skills