

# Kyle Westhaus

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## OBJECTIVE

Seeking a security engineering internship applying cybersecurity and software engineering skills gained from work experience and personal projects, available starting May 2021.

## EDUCATION

The Ohio State University, Columbus, OH | B.S. in Computer Science Engineering May 2022  
Overall GPA (4.00 scale): 3.985; Major GPA: 3.960  
Honors: Honors Student, Recipient of Maximus scholarship (2018-2022), Dean's List (AU18-SP20)

## WORK EXPERIENCE

- Garmin Ltd**, Olathe, Kansas | Software Engineering Intern June 2020 - August 2020
- Designed, implemented, and tested transition between TLS libraries to free 6% of total flash storage
  - Wrote and debugged multithreaded security-critical C networking code in a custom OS for ARM devices
  - Managed changes and communicated integration instructions to code owned by multiple internal teams
- Kudu Dynamics LLC**, Chantilly, Virginia | Cybersecurity Engineering Intern May 2019 - August 2019
- Extended capabilities of an automated program security analysis system to create universal control flow graphs from abstract syntax trees for 12 interpreted languages
  - Improved setup to automatically spinup and connect emulators for confirmation of n-day vulnerabilities
  - Integrated automatic testing and linting using Gitlab and pytest to drive coverage to 90%
- Air Force Research Lab**, Dayton, Ohio | Computer Science Intern - Wright Scholar June 2017 - August 2017
- Utilized Unreal Game Engine, GIS software, and other off-the-shelf technology to create a 3D interactive model of the National Center for Medical Readiness for training exercises on a 60 acre property
  - Sourced, processed, and ingested elevation and image data to make a realistic high-fidelity (1 meter elevation / 1 foot imagery) terrain map

## ENGINEERING PROJECTS

- Capture the Flag Competitions (CTFs)** | Independent Competition 2014 - Present
- Placed 1st in Ohio State CTF, top 3% in Hack-a-Sat DEFCON, and participated in 20+ other CTFs
  - Utilized standard tooling including Ghidra, AFL, Bochs, pwntools, Wireshark, Binwalk, and Aircrack-ng specializing in reverse engineering, network attacks, RF and Wifi cracking, and firmware analysis
  - Rapidly developed custom exploitation and analysis scripts for unfamiliar concepts and architectures
- Security Tool Implementation** | Information Security Course February 2020 - April 2020
- Implemented an Nmap-style network scanner in Python capable of crafting custom IP and TCP packets to send over raw sockets, allowing for advanced host detection, port scanning, and service identification
  - Incorporated IDS evasion tactics such as packet fragmenting, IP spoofing, and custom TCP options
  - Managed students with minimal prior security experience and educated team on low-level network security
- E-ZPass Radio Frequency Reverse Engineering** | Independent Research November 2018 - July 2019
- Reverse engineered RF protocol in use by 35 million toll booth devices and demonstrated capability for low-cost (\$80) replay and spoofing attacks with RTL-SDR and Osmo-FL2k hardware tools
  - Wrote a packet dissector and generator for TDMA transponders with C++ and GNU Radio
  - Responsibly disclosed findings and advised E-ZPass CEO on business implications of attacks
- Linux Home Servers** | Independent Research June 2016 - July 2020
- Designed and implemented encrypted 200GB-weekly automatic backup system with authentication for laptops and phones on home network via a Linux Network Accessible Storage development board
  - Developed skills for Linux, server hardening, remote access, systems maintenance, and networking

## QUALIFICATIONS

- Programming Languages: Proficient in C and Python; prior experience with C++, Ruby, Java, and Matlab
- Environments: Extensive use of Linux, command line (including scripting), and version control (Git)

## ACTIVITIES AND INTERESTS

- Presenter at BSides Columbus Security Conference, Toll Booth RF Reverse Engineering March 2019
- Tutor at Bridge Community Center in various subjects for refugee children January 2019 - Present
- Cybersecurity Club Vice President (August 2019 - Present), Active Member August 2018 - Present
- Eagle Scout, Leadership Positions including Senior Patrol Leader and Philmont Crew Leader April 2016