Samantha J. Comeau

(603) 370-1443 · 56 Stoney Brook Ln Auburn, NH 03032 · sjcomeau@wpi.edu · sjcomeau43543.github.io

ABOUT ME

Interests: Research and Development, Systems Security, Embedded Development, Reverse Engineering

EDUCATION

Worcester Polytechnic Institute, B.S Computer Science, Minor in Electrical and Computer Engineering   May 2019

Worcester Polytechnic Institute, M.S Computer Science concentration in Computer Security   May 2020

EXPERIENCE

Senior Information Security Assistant, *WPI Information Security***,** Worcester, MA   May 2018 – Present
· Lead Information Security assistants by delegating tasks and aiding communication between staff and assistants
· Lead project of automating the banning of MAC addresses on WPI's network for AUP violations
· Produce formal documentation including project proposals and NDA(s)

Cyber Intern, *MITRE***,** Bedford, MA   May 2019 – August 2019

Cyber Intern, *MITRE***,** Bedford, MA   May 2018 – August 2018
· Automate the generation of signed platform software and components for an embedded device
· Reverse engineer a program that interacts with system services on an embedded device (ARM)
· Develop programs to automatically interact with kernel variables and filesystem utilities

Cyber Intern, *MITRE***,** Bedford, MA   May 2017 – October 2017
· Develop a function matcher using symbolic execution in Python with open source package *angr*
· Improve performance of existing program through creating Singleton instance of symbolic Control Flow Graphs using JSON to store NetworkX Digraphs in SQL database
· Learn and use tools such as Radare2, IDA Pro, and more in order to reverse engineer binary files compiled for ARM, MIPS, and X86 both statically and dynamically
· Present findings to both technical and non-technical members of WPI's community for the Major Qualifying Project

Information Security Assistant, *WPI Information Security***,** Worcester, MA   October 2016 – May 2018
· Use Splunk to analyze network traffic and create dashboards to ease usability for analysts
· Filter and anonymize network data logs using regular expressions with SED while following information privacy policies
· Research and recommend security improvements to WPI employees for hosted websites using ZAP and Nessus

Field Engineer / Systems Programmer, *Maverick Integration***,** Nashua, NH   July 2013 – August 2016
· Program processors to interact with home automation systems securely using manufacturer specific programming tools
· Diagnose and solve networking problems in the office and at customer locations

PROJECTS

Software Security Engineering, *Worcester Polytechnic Institute*
· Research and present on current topics in cybersecurity and lead discussions on the topic (DNS Rebinding, UNVIEL)
· Hack software programs and websites using SQL injection, XSS, CSRF, buffer overflow, DLL attacks and others
· Use the black/white box testing methodology to find and patch vulnerabilities in software programs and websites

Using Data Visualization to Communicate the Sources of Plastic Pollutants in Port Phillip Bay, *Worcester Polytechnic Institute and the Port Phillip EcoCentre*
· Use GIS mapping to visualize plastic pollution data and embed findings into the EcoCentre's website
· Present findings and give recommendations to city officials based on the locations of highly polluted areas and supplemental factors that could be contributing to these spikes in pollution levels

Containerized Home Automation System, *ONGOING*, *Worcester Polytechnic Institute*
· Design a Raspberry Pi cluster running Docker and Nomad which controls a home automation system
· Program Arduinos to communicate over WiFi and Bluetooth to the Docker cluster to transmit sensor data and receive commands securely to interact with different aspects of the home

Software Engineering, *Worcester Polytechnic Institute*
· As project leader, manage a team of eight people in order to produce a navigation application using AGILE project management techniques
· Develop database with security considerations including sanitization of input and encryption
· Work with junior developers to lead and teach them through peer programming
· Lead team to produce the winning application through delegation based on individual's skillset, allowing for interdepartmental constructive feedback, and flexibility of tasks based on team's interests

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Advanced Operating Systems, *ONGOING, Worcester Polytechnic Institute*
· Use Amazon Web Services to run Apache's Hadoop on EMR using S3 for storage
· Compare Docker's default networks to Docker's private networks to determine the tradeoff between security and ease of use

Advanced Digital Circuit Design, *Worcester Polytechnic Institute*
· Develop programs for FPGA's using Verilog with knowledge of adders, multiplexors, finite state machines, SPI and I^{2}C
· Use timers and interrupts to produce an oscilloscope with different voltages / wavelengths on the MSP430

Independent Study Project on Safety Technology, *Worcester Polytechnic Institute*
· Research and compare safety technologies designed for college students, women, people with disabilities and more

Machine Learning to Identify Android Applications, *ONGOING, Worcester Polytechnic Institute*
· Using a Gateway and VMs classify the running Android Applications based on network traffic

RF Emitter, *ONGOING, Personal Project*
· Create a program on a Raspberry Pi that emits RF signals to control a projector
· Receive input on Raspberry Pi through voice commands to Amazon's Alexa using Amazon Lambda
· Solder the components onto a PCB after the circuit has been designed and tested on a breadboard

Protecting the Solar Energy Grid, *ONGOING, Personal Project*
· Set up a solar panel to charge lithium ion batteries and secure communication with the SCADA system (Raspberry Pi)
· Solder a prototype on a PCB

BeagleBone + UBoot, *ONGOING, Personal Project*
· Utilize CAN bussing and UART on a BeagleBone to send information to other embedded devices
· Modify the UBoot library to load onto the BeagleBone

Independent Study Project on Cryptography, *Worcester Polytechnic Institute and MITRE Corporation*
· Design a course on cryptography in collaboration with MITRE as the initial collaboration for course credit at WPI
· Implement a TLS secure chat server that uses RSA in Java to encrypt and decrypt messages

Computer Networks, *Worcester Polytechnic Institute*
· Develop working communications between layers of the network stack using protocols such as GoBack-N, Alternating Bit Protocol, HTTP 1.1, and distributed asynchronous Distance Vector Routing algorithm
· Use Wireshark to analyze network traffic

Operating Systems, *Worcester Polytechnic Institute*
· Develop a text-based shell to demonstrate knowledge of process creation, termination, and resource usage
· Create programs based on virtual memory and concurrency with semaphores and page tables

Machine Organization and Assembly Language, *Worcester Polytechnic Institute*
· Work with assembly language, C, and Ubuntu to control buffer overflow, diffuse binary "bombs", and simulate a cache

ACTIVITIES AND LEADERSHIP

Founder, Students Mentoring Active Responsibility Together   August 2016 – Present
· Leadership Positions: President, Vice President, Vice President of Community Outreach

Society of Women Engineers   March 2016 – Present
· Leadership positions: Secretary

Alpha Phi International Women's Fraternity   January 2016 – Present
· Leadership positions: Director of Target Membership Marketing, Marshall

CyberSecurity Club   January 2018 – Present

TRAINING AND CERTIFICATIONS
· Splunk Certified Power User 6.x, Emerging Leaders Conference Series, Scholarship for Service Conference '18 '19, Women in CyberSecurity Conference '18 '19, Women in Defense Conference '19, Grace Hopper Conference '18

COMPUTER SKILLS
· Operating Systems: Ubuntu, Linux Mint, Kali Linux, TinyCore Linux, MacOS, Windows
· Languages: Python, C, Verilog, Java, JavaScript, HTML, SQL, R, CSS, C++, JQuery