Dhairya Surana

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Objective

I am a passionate and determined senior who is pursuing a major in Computer Engineering and a minor in Cybersecurity at Virginia Tech. My experience includes an **internship at Microsoft HQ (Bellevue, WA) during the summer of 2019**. I am looking for full-time cyber/software opportunities that will allow me to apply my current skills and learn new technologies.

Education

2016 - 2020

CPE Bachelor of Science in Computer Engineering, Minor in Cybersecurity

- Virginia Polytechnic and State University (Virginia Tech), Blacksburg, VA

Employment History

- **Microsoft Internship (Bing Maps Team - Summer 2019):**
  - Architected and developed the "Map Approval and Review System" (**M.A.R.S**) web tool to enhance the geodata review process for Bing Maps managers.
  - This tool improved the geodata approval process efficiency by 20%.
  - Followed the Agile method to design and develop the tool to a minimum viable product (MVP).
  - This tool was a full-stack Django project:
    - Used SQLite database/Python for the backend
    - Used HTML/CSS and Javascript/jQuery for the frontend
  - Developed unit test cases and documentation based on project requirements.

Skills

- **Programming Languages:** Python, C/C++, HTML/CSS, JavaScript/jQuery, Java, Bash Shell Scripting, Processing (GUI-based), MATLAB
- **Cybersecurity:** Authentication, XSS, CSRF, Cryptography, Ciphers, Encryption/Decryption, Malware, Networking, Nmap, Wireshark, Penetration testing, Web Security, IP/TCP
- **Frameworks:** Django (full-stack), Bootstrap (HTML), Qt (C++)
- **Development Methodologies:** DevOps, Agile, Waterfall
- **Virtual Environments:** Vagrant/Valgrind, Oracle VM VirtualBox
- **Operating Systems:** Windows, Ubuntu, Fedora, Linux/Unix
- **Version Control:** Git/GitHub/GitLab
- **Relevant Coursework:** Data Structures and Algorithms, Embedded Systems, Net Apps, Computer Network Security Fundamentals, Principles of Computer Security, Computer Systems, Intro to Unix, Applied Software Design
- **Other Technical Skills:** object-oriented design, GIS, full-stack development, AWS Cloud platform, Computer Vision, Rest API, Trello

Extracurriculars

- **AT&T Externship (Summer 2020)**

- Learned about various technical topics such as networks, artificial intelligence, cybersecurity, etc.
- Learned about various job skills such as professional writing, ethics, etc.

- **CubeSat Design Software Team Member (Spring 2019)**
  - Analyzed microcontrollers and software systems to decide which to use for the satellite's flight computer.
  - Documented the code for the GPS driver.
  - Used Trello for goal management.
  - **The Virginia Tech CubeSat Team won 1st place in the SEDS SAT II Competition based on its Preliminary Design Review (MIT was in 2nd place and Purdue was in 4th place)**

- **Robogrinder Computer Vision Team Member (Spring 2019)**
  - Designed algorithms to detect the position and velocity of an opponent robot.

- **NASA L'Space Academy Levels 1 and 2 (Fall 2018 – Spring 2019):**
  - Planned a hypothetical unmanned mission to Mars with a team of 8 people.
    - Mission Objective 1: Mapping out lava-tubes to get a better idea of the Martian tunnel system.
    - Mission Objective 2: Determining the composition of gasses underneath Mars.
  - Performed a Risk Analysis for the mission.
  - Hosted meetings and planned the project schedule of the mission.
  - Presented the Preliminary Design Review (PDR) to L'Space Administrators (NASA employees)

Software Projects

- **Stock Analyst (Summer 2020)**
  - A Python Web Scraper that scans the Morningstar website for stock data
  - Returns a list of stocks based on certain financial statistics

- **Rasp Guru (Spring 2020):**
  - Team Project that involved Implementing a Q&A system involving 2 raspberry pi computers
  - Questions were asked via Twitter tweets
  - Answers were generated via WolframAlpha computational knowledge engine
  - IBM Watson API Text-to-Speech API used for speaking questions and answers

- **Rover Delivery System (Spring 2020):**
  - Team project that involved designing a rover delivery system for packages
  - Used Trello to manage deliverables
  - Architected the rover's obstacle detection system (ultrasonic sensor)
    - Used FreeRTOS for displaying distance data
    - Implemented MQTT for intercomponent communication
    - Involved UART, GPIO, ISRs
  - Followed Agile methodology

- **The Patriot Virus (Fall 2019):**
  - Designed/developed an online video game using the Processing framework and Javascript
  - Followed DevOps methodology
  - Deployed using Amazon Web Services (AWS)
  - Used Adobe Illustrator for animations
  - The game involved the following:

        - Finite state machines (FSMs)
        - Parallax
        - Sound effects/music
    - Link: http://thepatriotvirus.s3-website-us-east-1.amazonaws.com/

- **Plotscript (Fall 2018):**
    - Added enhancements to the custom Plotscript language, whose prototype was initially developed by my professor using C++.
    - Implemented the following:
        - Mathematical operations
        - Lambda functions
        - Qt graphics for the interpreter
    - Plotscript was tested via Vagrant/Valgrind.

- **ASCII Zombies (Fall 2018):**
    - Developed a top-down zombie shooter in a Linux environment using Python 3.7
    - Implemented basic AI, multi-threading, ASCII animations, and an installer using bash.

- **Digital Pet Simulator (Fall 2018):**
    - Developed a digital pet simulator (Tamagotchi game) for the Texas Instruments MSP432 microcontroller board using C.
    - The simulator Involved UART and finite-state machines.

- **Student Records Management System (Fall 2017):**
    - Developed a C++ program that organized student data from an input text file.
    - The program Involved structs and dynamic memory allocation.

Cyber Security Projects

- **Compromised System Forensics (Spring 2020):**
    - Scenario: Analyze a compromised Linux machine (Virginia Cyber Range VM)
    - Used Intrusion Detection protocols along with Linux knowledge to find issues
    - Documented findings in a detailed manner

- **Web Search Inspector (Fall 2019):**
    - Scenario: Perform pen testing of a mock web search startup (hosted on VM).
    - Conducted XSS, CSRF, and other attacks to expose vulnerabilities.
    - Documented vulnerabilities and their solutions.

- **Crypto Crook (Fall 2019):**
    - Scenario: Attack a mock online bank by generating a URL that would unlock all accounts.
    - Implemented a length extension attack that takes advantage of the MD5 hash function.
    - **Fun fact: Length extension vulnerability of mock bank was like that of Flickr API in 2009.**

- **Net Guard (Fall 2019):**
    - Created a Python tool to detect port scanning attempts
    - The tool analyzes pcap files and returns a list of suspicious hosts