Ryan Guide

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Education

- **The Penn State University** University Park, PA
  Master of Science in Computer Science and Engineering *December 2022*
  Systems and Internet Infrastructure Security Lab *Systems and Internet Infrastructure Security Lab*
  Courses: *Operating Systems, Data Structures and Algorithms, Networks, Computer Architecture, Networking, Programming Language Theory, Security*

- **Allegheny College** Meadville, PA
  Bachelor of Science in Mathematics *May 2020*
  Courses: *Combinatorics, Abstract Algebra, Probability and Statistics, Computability Theory, Differential Equations*

Experience

- **The Penn State University**
  Teaching Assistant for a Data Structures course *August 2021 - December 2022*
  - **Recitations**: Hosted recitations and taught coding concepts
  - **Tutoring**: Worked with students one on one to help them develop coding skills
  - **Material Preparation**: Prepared material to foster a deeper understanding of fundamental programming concepts

Software Systems and Research

- **Network Data Pipeline (Research)**: Ran AWS cloud data on modified SIDS rules to efficiently analyze the impact of modifications to the rules. Tech: Python, Snort
  - **Parsing**: Utilized regular expressions to read and create altered SIDS rules
  - **Data Management**: Condensed network traffic files into efficient hash tables for analysis
  - **Analysis**: Ran network traffic against a heuristic ground truth to assess the impact of altering the SIDS rules
- **PFS Simulation**: Virtual file system that managed reads and writes to a simulated disk. Tech: C
  - **System Control**: Designed command blocks to perform actions in the system
  - **File Management**: Maintained an allocation table of files to prevent corruption
  - **Debugging**: Utilized debugger to identify and fix edge cases under real-world workloads
- **Dynamic Memory Manager**: Implemented a dynamic memory allocation tool that managed assigning and freeing memory blocks in a system. Tech: C
  - **Space Optimization**: Maximized space utilization by splitting and coalescing memory blocks
  - **Time Optimization**: Utilized linked lists within the free memory blocks to efficiency identify the optimal allocations
- **Network Traffic Analysis**: Worked on a collaborative project to measure the presence of a botnet on a set of traffic from the cloud. Tech: Python, WireShark
- **Grading Website**: Full stack website designed to be used as a database backed grading system. Tech: Flask, SQL, heroku

Publications

- **Paper: Characterizing the Modification Space of Signature IDS Rules**: Expected publication in late 2022. Tech: Python, Snort, Docker

Memberships and Awards

- Invited to Golden Key Honor Society - January 2022
- Inducted in Pi Mu Epsilon mathematics honor society - May 2020
- Certification for outstanding teaching contributions - September 2022

Skills Summary

- **Languages**: Python, C, Racket, JavaScript
- **Frameworks**: Flask REST, React,
- **Tools**: Docker, GIT, SQLite, Snort
- **Skills**: Full stack development, systems programming
- **Soft Skills**: Leadership, Teaching, Writing, Time Management, Problem Solving, Communication