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Objective

To obtain a full-time Software Engineering or Data Science position at Sandia National Laboratories with an emphasis on Machine Learning and Security

Education

University of Missouri - Columbia — July 2021
Ph.D. Computer Science — **GPA: 3.92/4.0**

Missouri University of Science and Technology — May 2019
M.S. Computer Science — **GPA: 3.92/4.0**

Missouri University of Science and Technology — May 2016
B.S. Computer Science — **GPA: 3.83/4.0**
Minor: Computer Engineering & Mathematics

Research Experience

University of Missouri - Columbia — Columbia, MO
Graduate Researcher — Fall 2019 - Present
- Utilized PyTorch in evaluating deepfake detectors against a data poisoning attack
- Developed a deep neural network in Keras and tensorflow to defend against a novel data poisoning attack on facial recognition
- Used sklearn and matplotlib to perform statistical analysis on image datasets
- Trained neural networks using amazon web services (AWS)
- Led a team of three graduate students

Missouri University of Science and Technology — Rolla, MO
Graduate Researcher — 2017 - 2019
- Used ANTLR, a parser generator tool, to compare JavaScript grammar rule utilization between benign JavaScript and malware
- Built a web crawler in Python using Scrapy to gather benign Javascript samples
- Created an evolutionary algorithm to generate simple context-free grammars given samples from a language

Work Experience

University of Missouri - Columbia — Columbia, MO
Graduate Teaching Assistant — 2020
- Graded assignments and exams for a junior-level database course
- Provided academic support and instruction to students

Missouri University of Science and Technology — Rolla, MO
Graduate Teaching Assistant — Fall 2019
- Instructed students on objected-oriented programming (C++)
- Prepared lesson plans that are both informative and engaging to students
- Enforced the high integrity standards outlined by the university

Sandia National Laboratories — Albuquerque, NM
Cybersecurity Intern — May 2017 - Dec 2019
- Applied machine learning to find correlations between source code and binary
- Wrote emulytics software using C for the 1553 data bus protocol
- Created a Laika BOSS module to filter out metadata
- Designed and implemented a graph labeling attack algorithm
- Developed Python libraries in C++ for more efficient software
- Analyzed network data using Bro and machine learning

Cybersecurity Training — January 2016/17/18/19
- Employed Metasploit to break into Windows Machines
- Used IDA Pro to reverse engineer malware
- Mapped out network topography using nmap and Netmeld

Cerner — Kansas City, MO
Software Engineering Intern — Summer 2016
- Created a Ruby On Rails web application with added security features
- Led a team of interns in weekly live demos to management
- Won crowd favorite at intern hackathon for uDate, an application that matched people based on self-reported medical data

Additional Experience

Personal Website — July 2020 - Present
- Implemented a personal website using Django
- Managed a PostgreSQL database
- Extensively used Django templates to promote concise and rapid development
- Created a mobile-first responsive website design using bootstrap
- Containerized website deployment via Docker
- Used TravisCI and Github Actions to automate unit testing and deployment
- Incorporated Google Search for quick and efficient website queries

Programming Competitions — Fall 2015 - 2019
- Won MS&T's Programming Cup - Individual's Bracket
- Top 100 on open.kattis in the US, a programming competition site used by ICPC
- ACM ICPC Regional's first place on-site

Compiler — Spring 2019
- Wrote a compiler for a pascal like language in C++
- Used flex for lexical analysis and bison for tokenization
- Implemented intermediate language generation and instruction optimization

Raspberry Pi Cluster — Spring 2019
- Built a raspberry pi cluster consisting of 4 raspberry pis
- Used the slurm workload manager to manage distributed tasks

Restaurant Recommender Website — Spring 2017
- Created a restaurant recommendation system using collaborative based learning
- Built a website using ruby on rails to recommend restaurants to users

AI — Spring 2016
- Programmed a chess AI using time-limited iterative deepening depth-first search minimax with alpha-beta pruning and quiescence search
- Achieved top 10 in connect four on riddles.io, an AI competition website

Computer Skills

Advanced:	C++	Python					
Proficient:	Java	Ruby	LaTeX	SQL	MATLAB	Javascript	HTML
	Django	Linux	Tensorflow	Keras	Sklearn	Numpy	GANs
	Metasploit	Nmap	Wireshark				

Publications
- **D Cole**, S Newman, M Cutkosky, D Lin. *In preparation.* Defending against targeted label flipping data poisoning attacks on deepfake detectors.
- **D Cole**, S Newman, D Lin. *Submitted.* "A New Facial Authentication Pitfall and Remedy in Web Services"

Honors & Activities

Scholarship For Service (SFS) Recipient
Association for Computer Machinery - **President**, **Secretary**
ACM Programming Competition - **Chair**
Cyber Defense Team - Member
Computer Science Department Leadership Award
Downtown Hall Association - **Vice President**
Institute of Electrical and Electronics Engineers - Member
Associated Students of the University of Missouri - **Programming Coordinator**
History Club - **Vice President**
Collegiate Eagle Scout Association - **Vice President**
President's Volunteer Service Award