Rajiv Sarvepalli

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Education

University of Virginia — Charlottesville, VA
Bachelor of Science in Computer Science — *Aug. 2018 – May 2021*
GPA : 3.906/4.0 Major GPA : 3.973/4.0

Research Experience

Undergraduate Research Assistant — Jan. 2019 - Current
University of Virginia — *Charlottesville, VA*

- Designed tool to analyze Docker containers on Docker Hub collecting data for security analysis.
- Built an Active Directory corporate environment through PowerShell and ESXi scripting for modeling user behavior.
- Assembled information about how attacks are executed by running red-team emulators collecting usable data.
- Preprocessed data with Python data science libraries to prepare for anomaly detection and classification tasks.

Research Assistant — June 2017 - Sep. 2017
George Mason University — *Fairfax, VA*

- Analyzed and organized data from IoT devices to increase accuracy of current models by 5% leveraging python machine learning libraries.
- Implemented time series motif discovery algorithms in Python using NumPy and SciPy.
- Created one of the first implementations of a novel matrix profile algorithm in Python from a publication.

Relevant Work Experience

Machine Learning Intern — May 2020 - Aug. 2020
Expedition Technology — *Herndon, VA*

- Researched, assessed, and adapted state of the art object detectors using PyTorch to detect small objects supporting an Agile team.
- Deployed Docker containers to AWS P2 instances through Jenkins to train neural networks.
- Constructed TensorBoard live feeds to monitor validation losses and observe qualitative results quickening the model evaluation process.
- Performed exploration of reinforcement learning libraries to find the best library with priorities of concision and readability.
- Researched simulation parameterization techniques for few-shot object detection.

Data Analyst Intern — Nov. 2019 - Current
NetForecast — *Remote*

- Developed and documented data management and data collection software to improve the structure and optimization (~5000 lines of code).
- Designed scheduled tasks using AWS cloud instances to perform constant data updates improving data quality.
- Analyzed data from traceroutes and pings to predict router locations using support vector regression and force simulations.
- Modernized software development to follow object oriented programming principles and design patterns.

Publications and Conferences

TECHCON | Conference — Sep. 2019

- Presented research work from University of Virginia.
- Illustrated the manner in which benign user's accounts are taken advantage of and framed for malicious attacks.
- Assessed collected data to speculate about ways to discern between benign and abnormal user behavior.
- Proposed using anomaly detection with clustering to differentiate malignant users from benign users.

Defense Against Persona Abuse Attacks | Poster Publication — Sep. 2019

- Explained modeling of a mock corporate environment and user emulators.
- Links: https://www.src.org/library/publication/p097600/or https://rajivsarvepalli.github.io/assets/pdf/src/P097600.pdf.

Teaching Experience

Undergraduate Teaching Assistant Aug. 2020 - Dec. 2020
University of Virginia *Charlottesville, VA*

- Provided weekly office hours for a Computer Architecture class with more than 300 students.
- Ran weekly laboratory sessions providing an overview and answering student's questions.
- Examined instructional material for understandability and clarity through reviewing assignments' overview and instructions.

Honors and Awards

Member of JUMP Undergraduate Research Initiative Jan. 2019 - Current

- Paid applicant-based year-long structured research program for undergraduate students.
- More information: https://engineering.virginia.edu/jump-undergraduate-research-initiative.

Intermediate Honors Nov. 2020

- Top 20% of students in Engineering Department after first 4 semesters.

Dean's List Fall 2018, Spring 2019, Fall 2019

- Earned 3.5 GPA while maintaining 15+ credits.

Relevant Coursework

Graduate Machine Learning
Machine Learning
Natural Language Processing
Computer Vision and Language
Statistical Learning and Graphical Models
From Data to Knowledge
Probability

Projects

Social Media Privacy Tool | *Python, PyTorch, Captum* Sep. 2020 - Current

- Used machine learning to examine the potential personal information in a social media post (image & text).
- Leveraged name entity recognition to recognize potential information leaks within a post's text.
- Developed CNN for image geolocation for a small subset of locations achieving high precision and recall.
- Made geolocation into a hierarchical classification problem through hierarchical clustering of GPS coordinates.
- Demo: https://youtu.be/vcs3M8CT884

Docker Explorer | *Python* Sep. 2020 - Current

- Scraped Docker Hub for Docker images of web servers that serve similar purposes.
- Compared similar Docker containers to do analysis of popularity and software package version numbers.
- Investigated collected data to determine any residual Common Vulnerabilities and Exposures (CVEs) left by not properly updating software in Docker containers.

User Emulator | *PowerShell, ESXi, Windows Domain Controller* Jan. 2019 - May 2019

- Created a set of PowerShell scripts to imitate basic user behavior in Active Directory.
- Imitated common behavior such as opening shared files and accessing websites.
- Collected data to monitor and understand user behavior as a function of logged information.

Anonymous Social Media Privacy Sep. 2020 - Current

- Senior year thesis on understanding the constraints of privacy within anonymous social media.
- Explored privacy through a sociotechnical lens: realizing the connection between the technical and social aspects of privacy.
- Examined the impact of technology in changing perspective of privacy: from the individual to the collective.

Technical Skills

Languages: Python, R, Prolog, C, Java, OCaml, LaTeX
Libraries: PyTorch, TensorFlow, Stable Baselines3, NumPy, SciPy, Pandas, Matplotlib, Scikit-learn
Developer Tools: Git, Docker, AWS, VS Code, MySQL, IntelliJ