Jonathan Perkins

Software Engineer

205-937-7363
jonperk318@gmail.com
github.com/jonperk318
jayandsparrow.com

PROFESSIONAL EXPERIENCE

Machine Learning Researcher at the University of Alabama at Birmingham
– *8/2022 to Present*

- Trained and validated **40+ machine learning models in Python** using Scikit-learn, Pytorch, Pyro, Nimfa, and other ML/AI libraries; evaluated results using EVR and other metrics
- **Removed 100% of cosmic rays** and 90% of background noise from hyperspectral HDF5 data of energy materials collected via cathodoluminescence spectroscopy
- Developed unsupervised and semi-supervised **variational autoencoder deep neural networks** (DNNs) for spectral and image feature detection
- **Created 120+ figures** demonstrating data cleansing techniques, latent space representations of hyperdimensional data, and accuracy of models through data visualization software
- Presented research progress and discussed publications on machine learning and nonlinear optics with research group on a weekly basis, collaborating on various research projects

Intelligence Analyst II at Queen Associates, Inc. (DarkTower) – *10/2023 to Present*

- **Programmed a Telegram chat JSON parser in Python** to scrape leaked credentials and export relevant data to CSV, increasing team's card data collection efficiency by 98%
- **Scripted and automated retrieval of 5+ TB of leaked data** using bash shell in a **Linux environment**, allowing for retrieval of 200 times more data than was initially possible in given time frames
- Analyzed more than 3 million leaked documents in Autopsy, collected information on 600 social media accounts using custom web scraping tools, and queried two dozen **SQL** tables with MariaDB
- Wrote or collaborated on **45+ technical reports** detailing phishing software, potential threats, and Fortune 500 client vulnerabilities; created Looker Studio graphics to visualize cyber criminal trends
- Tested and analyzed open and closed source code of malicious applications written in **C#/.NET, Python, JavaScript, and PHP;** examined capabilities of Microsoft Azure Virtual Desktop (RDP)
- Used OSINT skills to track 35 threat actors through network traffic analysis, social media, and public record databases; delivered key findings with clear and actionable recommendations

Data Scientist Intern at the National Science Foundation (NSF) – *5/2023 to 8/2023*

- Participated in a Research Experience for Undergraduates (REU) program as a computational data scientist tasked with cleansing and modeling spectroscopic data in Python
- Tested 30 signal processing filters and trained **PCA and NMF machine learning models** to obtain a parts-based representation of complex, multidimensional data
- Collaborated on investigations into potential applications of convolutional neural networks (CNNs)
- Demonstrated locations and causes of photovoltaic (PV) material degradation

EDUCATION

B.S. Physics - University of Alabama at Birmingham (May 2022 - Dec 2024) - **3.75 GPA**

- Minors in **Computer and Information Sciences**, Mathematics; computational track
- Coursework: computational physics, applied machine learning, object-oriented programming, algorithms and data structures, multivariable/vector calculus, differential equations, quantum mechanics, electromagnetic theory, linear algebra, chemistry, biology, computer vision
- Honors: **NASA Alabama Space Grant Consortium (ASGC) scholarship**, other local physics grants, Society of Physics Students, distinguished honors, presidential honor roll

B.S. Interdisciplinary Studies - Liberty University (Aug 2016 - Dec 2019) - **3.25 GPA**
- Concentrations in business and world religions

SKILLS

Languages: Python, Java, JavaScript, TypeScript, HTML5, CSS3, C/C++, MATLAB, VBA, SQL

Frameworks/libraries: React, Node.js, Express.js, Next.js, Tailwind CSS, Three.js, Qt, OpenCV, TensorFlow, Numpy, Pandas, Matplotlib, Scipy, Sci-kit learn, Pytorch, Jupyter

Tools: Linux, shell scripting (Bash, Zsh, Powershell), GNU utils, Windows, MacOS, Git, Docker, VSCode, Vim, Excel/MS Suite, web hosting, cloud computing, AWS (S3, Lambda), APIs, SSL/TLS/HTTPS, SSH, cryptography, IPv4/IPv6, CI/CD, DevOps, unit testing, PostgreSQL

Soft skills: communication, problem solving, analytical thinking, innovation, reliability

Spoken languages: Spanish, Portuguese, French; conversational in Italian, Chinese, Arabic

PROJECTS

Full Stack Website – foureyedbutterfly.com

- CRUD app built using **JavaScript, Sass CSS, React/Vite, Node.js, Express.js, Axios, and MySQL**; deployed on a DigitalOcean droplet (Ubuntu) with an Nginx reverse-proxy server; used by Ruby M. as a personal blog; implemented token-based user authentication and credential encryption

Machine Learning Analysis of Hyperspectral Data – research.jayandsparrow.com

- Used non-negative matrix factorization (NMF) and variational autoencoder (VAE) machine learning to analyze spatial and spectral features of hyperspectral cathodoluminescence (CL) spectroscopy images taken from PV cell energy materials; communicated effectiveness of techniques

Sorting and Searching Algorithm Benchmarks – jonperk318.github.io/sorting-algorithms/

- Compared efficiencies of 8 sorting algorithms and 3 searching algorithms in 4 languages: **Python, Java, C++, and JavaScript**; created interactive data visualizations using JavaScript and Chart.js