Aviraj Sinha (Avi)

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Objective

I am a recognized ML scientist, engineer, and patent holder with extensive experience and publications in machine learning and data research. I have led the implementation of highly challenging and technical industry research projects involving complex data engineering, statistical analysis, modeling, and deployment. Currently a PhD candidate, I am seeking a full-time position in Fall 2024 or an internship position.

Education

- **Southern Methodist University** — Dallas, Texas
  PhD Computer Engineering *(Machine Learning and Quantum Engineering); GPA: 3.9* — *Jan 2021 - Current*
  Courses: *Neural Networks, Statistical Learning, Computer Vision, Neural Networks*
- **Southern Methodist University** — Dallas, Texas
  MS and BS Computer Science *(Data Science Specialization); GPA: 3.8* — *Aug 2016 - Jan 2021*
  Courses: *Artificial Intelligence, Machine Learning, Data Structures, Databases, Information Retrieval, Data Mining*

Skills Summary

- **Languages** Python, C++, JAVA, MATLAB, R, Mathematica, JavaScript, SQL, LaTeX
- **Libraries** Scikit, TensorFlow, Keras, Pandas, NumPy, SciPy, Seaborn, Matplotlib, OpenCV
- **Tools** Docker, Singularity, Conda, GIT, Jupyter, SLURM
- **Platforms** Linux(Bash), AWS, Windows, NVIDIA Superpod, Parallel Compute (HPC)
- **Certifications** Comptia Cloud+, Security+, (CCAP) Cloud Admin, Microsoft Office Professional

Experience

- **Raytheon - Machine Learning Engineer**
  Mobile Sensing/ Biometrics *- collaborated sponsor as a graduate researcher* — *Jan 2018 - Current*
  - Architected and implemented processing pipelines in Python for data collection from mobile sources(developed in Java) to organize cloud storage using AWS API, which is then input into a custom ML algorithm. The application was successfully used to collect data for experiments for hundreds of users and was used in publications.
  - Designed mobile biometric authentication methods by implementing state-of-art convolutional neural networks in TensorFlow for Android and IOS applications using accelerometers, gyrometric sensors, and eye-tracking data, which was preprocessed using NumPy and Pandas.

  Network Anomaly Detection - collaborated sponsor as a graduate researcher

  - Implemented anomaly detection on large-scale networks, including industrial control systems (ICS) and military vehicles (MIL-standard), using consensus of multimodal models from disparate data sources, including packet and sensor data. Data was sourced and processed using Python.
  - Created combinations of recurrent and convolutional machine learning architectures (RNNs and CNNs) that resulted in publication and patent.
  - Performed advanced sensor visualizations using languages such as MATLAB and R. Explained to the client the understanding of system security threats through sensor data visualization.

- **Goldman Sachs - Machine Learning Engineer/ ML-Ops**
  Enterprise Anomaly Detection *- Lead graduate researcher* — *Aug 2022 - Aug 2023*
  - Led design of high-performance parallel data processing architectures on SMU's high-performance computer (HPC) and GPU processing on NVIDIA SuperPod for enterprise big data analysis and ML algorithm development.
  - Designed the data loading and processing pipeline using Linux bash scripting with bash on SLURM and Python multiprocessing libraries. Performed massively parallel data preprocessing, cleaning, and aggregation on multiple terabyte datasets.
  - Implemented semi-supervised, multi-output random forest regressor network anomaly detection system that is used to fingerprint user behavior and obtain deviations from normal system behaviors as anomalies.
  - The final design was tested and used to find real-world anomalies. The deliverable was then used as the starting point of implementing ML-based anomaly detection.