Vikram Rangarajan

Website: https://vikramrangarajan.github.io/   Email: vikram.rangaraja@gmail.com

LinkedIn: https://www.linkedin.com/in/vikram-rangarajan/   Location: Plainsboro, NJ, 08536

GitHub: https://github.com/VikramRangarajan/   Phone: 609-608-6762

Education

Bachelor of Science -- Computer Science – Machine Learning Track, Statistics Minor
University of Maryland, College Park, MD, 20742
09/22 - Expected 05/25
GPA: 4.0
Relevant Coursework: Object-Oriented Programming 1 & 2, Organization of Programming Languages, Computer Systems, Calculus 1, 2 & 3, Linear Algebra, Statistics, Discrete Math, Algorithms, Data Science, Artificial Intelligence

Experience & Projects

Shahoveisi Lab, College Park, MD, 20742
Undergraduate Research Assistant
02/24 - Present

- Assisted in creating manuscripts for machine learning research projects related to identifying and managing turfgrass related diseases
- Used methods such as transfer learning and gradual unfreezing to train highly accurate nematode image classifiers
- Performed automatic hyperparameter optimization to train scikit-learn and PyTorch models to achieve highest metrics
- Performed image dataset preprocessing for use in a PyTorch deep neural network image classifier using OpenCV

SimpleTensor
02/24 - Present

- Created a library which provides Tensors with reverse-mode automatic differentiation capabilities using only numpy arrays for the Intro to Artificial Intelligence (CMSC421) class
- Supports many differentiable n-dimensional tensor operations such as matrix multiplication, convolution, element-wise functions, aggregate functions, and arithmetic operations, with support for operations along any axes
- Created MNIST demo using convolutional, dense, and normalization layers and used techniques such as Xavier/Glorot initialization and residual connections
- Fully documented using sphinx at https://vikramrangarajan.github.io/SimpleTensor/

SimplePyML
08/23 - Present

- Created Python library to implement and understand machine learning algorithms using numpy and scipy
- Implemented dynamic multilayer perceptron networks with more features to come
- Achieved ~98.6% accuracy with MNIST database after some testing, but not enough testing has been done to find maximum accuracy

- Successfully implemented conditional GPU acceleration using cupy
- Fully documented using sphinx at https://vikramrangarajan.github.io/simplepyml

A.M. Best Rating Services, Oldwick, NJ, 08858
Data Strategy Engineer
10/23 - 01/24

- Responsible for transitioning workflows from Prefect to Apache Airflow
- Learned to use Azure Data Factory (ADF) to transform data on the Azure Cloud Platform
- Used Airflow to orchestrate pipelines on ADF and prepared Airflow features for production use such as notifications, encryption, error handling, and failsafes
- Accelerated a data pipeline from 90 minutes down to 6 minutes

A.M. Best Rating Services, Oldwick, NJ, 08858
Data Strategy & Architecture Intern
06/23 - 07/24

- Learned to use and manage virtual machines such as Docker containers with services and WSL
- Discovered Apache Airflow's workflow management features and architecture, and presented knowledge to 7 teammates
- Set up and connected to a PostgreSQL database through Airflow to insert live government weather data hourly for over 900 cities nationwide
- Created an ETL pipeline in 2 weeks which automatically extracted data from oracle databases and loaded them to an Azure Data Lake with Pandas as the link
- Followed the software development life cycle to create ETLs and progress them all the way through the testing environment

Publications

1. Fereshteh Shahoveisi, Benjamin Waldo, **Vikram Rangarajan,** et al.
   Deep Learning Detection of Seven Plant-Parasitic Nematode Genera Associated with Turfgrass
   In Preparation, 2024
2. Fereshteh Shahoveisi, **Vikram Rangarajan,** et al.
   Enhancing Precision Weed Prediction in Golf Courses Using Machine Learning Algorithms
   In Preparation, 2024

Technical Skills

Programming languages: Python, C/C++/CUDA, Rust, Java, OCaml, R, SAS
Technologies: Git, Linux, TensorFlow, PyTorch, NumPy, scikit-learn, OpenCV, Ray, Docker, Azure Cloud Services, SQL, Relational Databases (Postgres, Oracle, SQL Server), Apache Airflow

Awards & Certifications

Astronomer Certification for Apache Airflow Fundamentals *02/24*
UMD Computer Science Semester Academic Honors *Fall 22 - Spring 24*