Vikram Rangarajan

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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:* Artificial Intelligence, Machine Learning, Data Science, Parallel Computing, Calculus 1, 2 & 3, Statistics, Linear Algebra, Compilers, Computer Systems, Algorithms, Organization of Programming Languages, Object-Oriented Programming 1 & 2, Discrete Math

Experience & Projects

[**Shahoveisi Lab, College Park, MD, 20742**](https://sites.google.com/view/umdturfgrasspathology/home)Undergraduate Research Assistant  
*02/24 - Present*

* Assisting in creating manuscripts for machine learning research projects related to identifying and managing turfgrass related diseases
* Using methods such as transfer learning and gradual unfreezing to train highly accurate nematode image classifiers
* Performing automatic hyperparameter optimization using Ray Tune to train scikit-learn and PyTorch models to achieve highest metrics
* Performing parallelized automatic image dataset preprocessing using OpenCV and NumPy

[**SimpleTensor**](https://vikramrangarajan.github.io/SimpleTensor/)*02/24 - 05/24*

* Created a library which provides Tensors with reverse-mode automatic differentiation capabilities using only numpy arrays for the Intro to Artificial Intelligence (CMSC421) class
* Supported 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/>

**A.M. Best Rating Services, Oldwick, NJ, 08858**Data Strategy Engineer  
*06/23 - 01/24*

* Gained advanced experience with relational databases, Docker, Linux, Python, and Pandas
* Learned to use Azure Data Factory (ADF) to transform and move data on the Azure Cloud Platform
* Used Apache Airflow to orchestrate ETL pipelines between on-premises databases and Azure
* Accelerated a data pipeline's execution time from 90 minutes down to 6 minutes using ADF

Publications

1. Fereshteh Shahoveisi, **Vikram Rangarajan,** Benjamin Waldo, Sadegh Jafari  
   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:** PyTorch, TensorFlow, NumPy, scikit-learn, OpenCV, Git, Linux, Docker, Ray, 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*