Vikram Rangarajan

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Education

**Bachelor of Science -- Computer Science - Machine Learning Track** *09/22 - Expected 05/25*University of Maryland, College Park, MD, 20742  
Minor: Statistics  
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

[**UMIACS, College Park, MD, 20742**](https://www.umiacs.umd.edu/) *10/24 - Present*Undergraduate Research Assistant

* Creating a neural video codec to surpass state of the art compression algorithms for image and video data
* Models are fit to decode the original video from input pixel coordinates efficiently
* Using methods such as model quantization and meta learning to achieve ideal reconstruction quality with high compression, high encoding, and high decoding speeds

[**Shahoveisi Lab, College Park, MD, 20742**](https://sites.google.com/view/umdturfgrasspathology/home) *02/24 - 11/24*Undergraduate Research Assistant

* Created 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 using Ray Tune to train scikit-learn and PyTorch models to achieve highest metrics
* Performed 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
* 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/

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

* 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-prem databases and Azure
* Accelerated a data pipeline's execution time from 90 minutes down to 6 minutes using ADF

Publications

1. **Vikram Rangarajan,** Fereshteh Shahoveisi, Benjamin Waldo, Sadegh Jafari  
   Identification of Plant-Parasitic Nematode Genera in Turfgrass Using Deep Learning Algorithms  
   Submitted, December 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, Racket, Assembly (x86, MIPS), SAS
* **Technologies:** PyTorch, TensorFlow, NumPy, scikit-learn, OpenCV, HPC (SLURM), MPI, OpenMP, Git, Linux, Docker, Ray, Azure Cloud Services, SQL, Relational Databases (Postgres, Oracle, SQL Server), Apache Airflow

Awards & Certifications

[Astronomer Certification for Apache Airflow Fundamentals](https://www.credly.com/badges/82aab031-8123-40de-b310-0c73394b5329/public_url) 02/24

UMD Computer Science Semester Academic Honors Fall 22 - Spring 24