

# Vikram Rangarajan

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## Education

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### 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

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### UMIACS, College Park, MD, 20742

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

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

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

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1. **Vikram Rangarajan**, Fereshteh Shahoveisi, Benjamin Waldo, Sadegh Jafari  
Identification of Plant-Parasitic Nematode Genera in Turfgrass Using Deep Learning Algorithms  
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

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- **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

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[Astronomer Certification for Apache Airflow Fundamentals](#)

UMD Computer Science Semester Academic Honors

02/24

Fall 22 - Spring 24