

# Vikram Rangarajan

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## Education

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### **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

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### **Shahoveisi Lab, College Park, MD, 20742**

Research Assistant

02/24 - Present

- Assisted in creating manuscripts for machine learning research projects related to identifying and managing turfgrass related diseases
- Created 3d visualizations of machine learning model output predictions using matplotlib
- Performed automatic hyperparameter optimization on scikit-learn and TensorFlow models to achieve highest metrics
- Performed image dataset processing for use in a Keras 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/simplepym1>

### **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

## Technical Skills

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**Programming Languages:** Python, C, Java, OCaml, R, Rust, SAS

**Technologies:** Git, Linux, SQL, Databases (Postgres, Oracle, SQL Server), Apache Airflow, Docker, TensorFlow, PyTorch, scikit-learn, OpenCV, Azure Cloud Services, Ray Tune

## Awards & Certifications

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**Astronomer Certification for Apache Airflow Fundamentals**

02/24

**UMD Computer Science Semester Academic Honors**

Fall 22 - Spring 24