

ADHARSH JAIKUMAR

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Education

Bachelor of Computer Engineering, Virginia Tech

GPA: 4.0/4.0

Expected May 2029

Blacksburg, VA

Experience

Amazon–Virginia Tech Initiative for Efficient and Robust Machine Learning

2026 – Present

Student Contributor, Virginia Tech Institute for Advanced Computing

Alexandria, VA

- Engineered Python-based data pipelines to process over 50,000 multi-modal sensor data points, reducing data preprocessing latency by 35% for biomedical and robotic applications.
- Benchmarked early-stage machine learning models using scikit-learn and PyTorch, achieving a baseline classification accuracy of 88% on preliminary evaluation datasets.
- Streamlined hardware-software integration by authoring automated testing scripts and comprehensive documentation, cutting environment setup time by 40% and ensuring full reproducibility.

Research

ALASCA: Asset Leakage with Acoustic Side-Channel Attacks in Multi-Joint

May 2025 – Present

Collaborative Robots

- Conducted robotics cybersecurity research under Dr. Sabur Baidya at the University of Louisville Automated and Robotics Research Institute, studying acoustic side-channel leakage in collaborative robots.
- Built signal-processing and machine-learning workflows to analyze motor acoustics, actuator noise, and motion-dependent sound signatures from multi-joint robotic systems.
- Developed acoustic feature-extraction pipelines to infer robot motion, joint behavior, and internal system state from externally captured audio.
- Contributed to a UoL paper published at **IEEE/RSJ IROS 2026**; presented the work at the UoL Computer Science and Engineering Graduate Research Competition and earned **2nd Place** among undergraduate and graduate presenters.

EyeNova: Ophthalmic Imaging System for Early Disease Detection

Sep 2024 – Present

- Developed a slit-lamp-based ophthalmic imaging system and CNN pipeline to identify ocular biomarkers associated with Wilson's disease, glaucoma, diabetic retinopathy, and macular degeneration.
- Integrated image preprocessing, feature extraction, low-cost imaging hardware, and ocular-anatomy constraints to support accessible screening applications.
- Awarded **First Place at Regional Science Fair**, **Second at Kentucky State** in Computational Biology, and multiple **Air Force Research Laboratory Awards**.

Skills

Languages	Python, Java, C++, C#, HTML, CSS, SQL
Frameworks	React, TensorFlow, PyTorch, OpenCV, scikit-learn, MATLAB
Technical Skills	Fusion 360, Arduino IDE, Robot Operating System (ROS), Docker, Android Studio, NumPy, signal processing, CNNs
Certifications	Machine Learning with Python by IBM (Coursera, with Honors) Introduction to Computer Vision and Image Processing by IBM (Coursera)

Projects

Trauma Relief Rover | *Nvidia Jetson Xavier NX, CUDA, ROS, mmWave Radar*

- Engineered a CUDA-accelerated edge-computing pipeline on an Nvidia Jetson Xavier NX to process mmWave radar data for through-wall human-presence detection.
- Integrated ROS-based sensing and control with signal filtering to detect micro-movements and reduce static-object interference.

Autofocus Eyeglasses | *Arduino, Fusion 360, 3D Printing*

Stock Trading Platform | *Python, Streamlit, scikit-learn*

Awards

USACO Gold Division Recognition

Kentucky Academy of Science: Top Scoring Student in Engineering, 2024

Air Force Research Laboratory Awards for biomedical and engineering research projects, 2021, 2023, 2024, 2025

Science Fair: Multiple regional and state first-place awards in computational biology, robotics, and engineering, 2021–2025