Bemi Oloyede

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Education

University of Pennsylvania — Philadelphia, PA
M.S.E Robotics — *August 2024 - May 2026*

Rochester Institute of Technology — Rochester, NY
B.S. Computer Science | Magna Cum Laude — *August 2017 - May 2022*

Relevant Skills

Languages: Python | C/C++ | Java | SQL | Javascript | HTML/CSS | PHP

Frameworks/Technologies: Isaac Lab |Pytorch | ROS2 | Docker | Git | CI/CD | Azure Kubernetes Service| Django

Experience

SICK Lidar Challenge — Philadelphia, PA
Team member — *Sep 2025 - Present*

- Architect and develop the full software stack for an autonomous robotic system, including a user-facing Node.js application and a backend service for on-demand ROS 2 process orchestration.
- Design and implement a Node.js to ROS 2 bridge using HTTP/WebSockets and a lightweight ROS 2 publisher node to translate user interactions into real-time robotic commands.
- Port motor initialization and control utilities from Python to C++, implementing raw SocketCAN communication and a full CANopen bring-up sequence (SDO configuration, PDO mapping, SYNC handling, and DS402 state transitions) to enable deterministic closed-loop motor control.
- Build a vision-driven front-end interaction layer using BlazeFace to detect user attention and dynamically activate interactive control workflows.
- Develop autonomous navigation and perception capabilities, including a wall-following algorithm for shelf traversal and an OCR pipeline for real-time shelf label recognition during motion.
- Design and implement a bidirectional UDP communication system over Ethernet between an onboard i.MX7 Linux computer and a Jetson, streaming real-time telemetry (wheel RPM, IMU, encoder, ToF) and receiving target RPM commands, LCD updates, and LED control signals.

ModLab, University of Pennsylvania — Philadelphia, PA
Research Assistant, HAMR — *Sep 2025 - Present*

- Contribute to microcontroller-based driver development for onboard sensors and actuators, supporting real-time communication between ESP32 hardware and Raspberry Pi.
- Develop a Visual-Inertial SLAM pipeline to maintain global pose in unstructured outdoor environments.

Research Assistant, SMORES — *Feb 2026 - Present*

- Develop a custom Ubuntu root filesystem to replace the stock Buildroot rootfs on Milk-V OS, enabling extended system capabilities.
- Design and maintain firmware that ensures reliable access to onboard hardware resources (I/O, peripherals, and system services).
- Integrate computer vision pipelines and evaluate machine learning techniques to improve autonomous docking performance.

University of Pennsylvania — Philadelphia, PA
Teaching Assistant, Design of Mechatronic Systems — *Aug 2025 - Dec 2025*

- Provide guidance in lab-based hardware/software development for embedded systems, including debugging bare-metal C code for the ATmega32U4, designing and testing circuits for robotic applications, and integrating sensors.
- Grade lab assignments and delivered constructive feedback to help students improve.
- Host recitations and office hours, clarifying lecture concepts and providing hands-on support for debugging, circuit design, and microcontroller programming.
- Assist in designing hardware and software used for evaluating students' final projects.

Teaching Assistant, ESAP Robotics — *Jul 2025 - Aug 2025*

- Mentored students in lab-based hardware/software development for mechatronic systems, supported students in hardware/software debugging, microcontroller programming, and project mentorship, including development of a synchronized Viva La Vida music-playing system.
- Graded lab assignments and homework, provided feedback, and assist students in understanding concepts learnt in class.

Konga Lagos, NGA
Backend Developer Intern *Aug 2023 - Aug 2024*

- Deployed Fluentd within the company's Azure environment to monitor logs from various deployments and forward them to Elasticsearch for processing.
- Developed a web-based analytics dashboard for developers to view real-time application performance and logs, reducing reliance on external vendors and lowering operational costs.
- Modernized legacy code by updating libraries, addressing security vulnerabilities, dockerizing applications, and deploying to an Azure Kubernetes cluster.
- Authored internal documentation and deployment guides to streamline onboarding and ensure maintainability of backend services.

Golisano Institute of Sustainability, RIT Rochester, NY
Robotics Application Intern *Jan 2022 – May 2022*

- Configured an NVIDIA Jetson Nano (2 GB) with a real-time Linux kernel for optimized ROS–UR10e communication.
- Established ROS network communication between the workstation and UR10e robot over Ethernet for reliable command streaming.
- Developed and deployed a pick-and-place shelving application for the UR10e, integrating Isaac Sim for testing and securing project funding through prototype demonstration.
- Authored detailed internal tutorials on system setup and tool configuration to support future lab projects.

Recent Projects

Autonomous Drone Racing Policy - NVIDIA Isaac Lab [Python] *Nov 2025*

- Developed a reinforcement learning pipeline using Proximal Policy Optimization (PPO) to train a drone racing agent in simulation. Tested policy on a Crazyflie 2.0
- Constructed custom observation and reward functions to encourage fast and stable flight through gates
- Designed episode reset and curriculum learning strategies to improve training and stability.

Fashion Designer Classification [Python/Pytorch] *Dec 2025*

- Surveyed literature on methodologies used for fine-grained visual categorization.
- Implemented multiple techniques such as a visual transformer and Bilinear CNN used for fine-grained visual categorization and benchmarked results against using Resnet-18 for fine-grained visual categorization on fashion dataset.

YOLO [Python/Pytorch] *Sep 2025*

- Implemented a full YOLO-v1 pipeline for detecting objects in 128x128x3 street-scene images including data pre-processing, model implementation, and evaluation.
- Developed efficient IoU and NMS modules for post-processing detections and visualizing bounding boxes.
- Automated training and validation by building custom Yolo datatset and dataloader and evaluated performance using mAP.

Autonomous VIO-based Quadcopter [Python] *May 2025*

- Developed a VIO-based autonomy stack in simulator for the Crazyflie2.0 drone, integrating camera-based state estimation using visual-inertial Odometry(VIO), global path planning with A* algorithm, minimum-jerk trajectory generation, and a geometric controller for robust trajectory tracking and control.

Place Recognition [Python/Pytorch] *Apr 2025*

- Collected and labeled real-world image data; performed data wrangling including cleaning and tabulation.
- Designed, developed and trained a CNN-based regression model using EfficientNet-B3 as a backbone with custom fully connected head to identify the location in an image

BULMA(Autonomous Robot Car) [C/C++, HTML/JavaScript] *Dec 2024*

- Designed and built WiFi-enabled robot car with autonomous navigation via light-sensing circuit, and feedback control using encoders, motor drivers, and I2C communication; achieved 1st place in class competition.

Certifications

Linux: File management for Devops (Coursera)
Introduction to Cloud Computing (Coursera)
Getting started with Git and Github (Coursera)

Relevant Courses

Big Data Analytics, Applied Machine Learning, Advanced Computer Vision, Introduction to Software Engineering, Artificial Intelligence, Physical Intelligence, Learning in robotics