Blake Webb

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Education

University of Maryland, Baltimore County — Glen Burnie, MD

Bachelor of Science in Computer Engineering, GPA: 3.4/4.0 — *Aug. 2022 – May 2026*

- Heritage Merit Scholarship Recipient
- Louis Stokes Alliance for Minority Participation (LSAMP) Scholar - NSF-funded program supporting minorities in STEM research

Research Experience

Undergraduate Robotics Researcher — Feb. 2024 – Present

University of Maryland, Baltimore County — *Baltimore, MD*

- Independently developed an event-driven camera system for robotic manipulation to track objects, reducing data overload in object tracking applications
- Built a 3D robotic arm simulation in Gazebo and Blender for physics-based experiments
- Implemented real-time image processing in Python, integrating OpenCV with ROS2 for differential camera systems
- Improved understanding of vision-based robotics through research on differential camera systems in physical and simulated environments

Undergraduate Computational Chemistry Research Assistant — June 2025 – Aug. 2025

University of Maryland, Baltimore County — *Baltimore, MD*

- Conducted density functional theory calculations using Quantum ESPRESSO for analysis of 2D materials for art conservation
- Created a Python program to automate the generation of supercell input files, streamlining workflows and enhancing the efficiency of quantum-mechanical calculations
- Analyzed surface transformations and electronic states of hydrogen and fluoride terminated MXenes

Immunology Research Assistant — Aug. 2021 – Sep. 2021

University of Maryland School of Medicine — *Baltimore, MD*

- Assisted PhD student in genetically modifying bacteria using PCR, minipreps, and cloning techniques
- Contributed to identification of novel immunotherapeutic targets for the treatment of cancer

Data Analysis Research Assistant — July 2020 – Aug. 2020

Remote

- Analyzed RNA sequencing datasets from COVID-19 patient samples using Excel to identify trends in gene expression
- Performed comparative analysis of immune signatures following COVID-19 infection

Presentations & Abstracts

Summer Undergraduate Research Fest (SURF) — 2025

- Analysis of Surface Transformations and Electronic States of Hydrogen and Flouride Terminated Mxenes

Louis Stokes Alliance for Minority Participation (LSAMP) Research Symposium — 2025

- Reducing Data Overload in Object Tracking: Differential Camera Systems in Physical and Simulated Environments

Summer Undergraduate Research Fest (SURF) — 2024

- Reducing Data Overload in Object Tracking: Differential Camera Systems in Physical and Simulated Environments

Projects

Microwave Landing System | *Team Collaboration, Systems Design* Feb. 2025 – May 2025

- Collaborated in a team of 8 engineers to design a microwave landing system
- Contributed to timing control and signal generation subteam efforts

Digital Noise Filter | *MATLAB, Signal Processing* Nov. 2024 – Dec. 2024

- Applied signal processing techniques to improve audio clarity while preserving key frequency components

3D Modeled Robotic Arm | *Blender, Gazebo, Linux* July 2024 – Sep. 2024

- Designed and 3D modeled a robotic arm in Blender for physics simulations in Gazebo

Leadership & Service

Apartment Community Resident Assistant Aug. 2024 – Present

UMBC Housing & Residential Life *Catonsville, MD*

- Managed a community of 47 residents, providing support, conflict resolution, and resources
- Organized monthly events to support student well-being and community-building

Welcome Week Woolie Peer Advisor Aug. 2023 – Oct. 2023

UMBC Housing & Residential Life *Catonsville, MD*

- Led a group of 30+ first-year students, guiding them through their first six weeks on campus

Technical Skills

Languages: Python, C/C++, MATLAB, System Verilog, VHDL
Frameworks & Tools: ROS2, OpenCV, Quantum ESPRESSO, Gazebo, Blender
Platforms: Linux (Ubuntu), PSPICE/Cadence
Areas of Expertise: Real-time Image Processing, Signal Processing, Machine Learning, Data Structures, Robotics, Circuits, FPGAs, Microcontrollers, Project Management, Technical Writing