

# Samuel Bloom

Boston, MA / Seattle, WA | (206) 280-5083 | Portfolio | LinkedIn | GitHub

## Education

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**Franklin W. Olin College of Engineering** **Needham, Massachusetts**  
*Electrical and Computer Engineering (B.S), Recipient of merit-based Olin Tuition Scholarship* 2024–2028  
**Coursework:** Discrete Mathematics, Microelectronic Circuits, Software Systems, Engineering Systems Analysis:  
Signals, Quantitative Engineering Analysis 1-3 (Linear Algebra, Differential Equations, DFT + FFT), Software Design.

## Experience

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**Weed identification Programmer + Robotics Researcher** **Needham, Massachusetts**  
*Artificial Intelligence in Robotics Lab (Olin College)* **SEP 2024–OCT 2025**

- Used Python, Open3D, and ROS 2 Humble to develop a real-time point cloud for weed identification purposes.
- Used Robotics-based solutions (Farming Robots) to compete in the Farm Robotics Competition (FRC).
- Used knowledge of camera and sensor implementation to move our robot in relation to real-world feedback.

**Software Design, Course Assistant** **Needham, Massachusetts**  
*Software Design Teaching Team (Olin College)* **JAN 2026–PRESENT**

- Supported instruction for 80+ students in an intermediate Python course, emphasizing good coding practice.
- Led weekly office hours and 1:1 tutoring to debug Python projects and assist in conceptual understanding.
- Reviewed and provided structured feedback on GitHub-based assignments, focusing on architecture and modularity.

**Project Development and Management Intern** **Redmond, Washington**  
*Microsoft* **OCT 2023–JUN 2024**

- Contributed to Windows-related project development through iterative planning, execution, and refinement.
- Supported the full project lifecycle by applying structured project management practices to track milestones.
- Implemented continuous improvement processes to refine workflows, incorporate feedback, and improve projects.

**Electromechanical Development Engineer** **Needham, Massachusetts**  
*Public Interest in Technology Team (PlnT)* **SEP 2024–OCT 2025**

- Utilized information from sensors—TDS contents, PH levels, Light, Temperature—to instruct autonomous caring.
- Used best prototyping, electrical, and mechanical practices to develop multiple hydroponic systems (shelves, carts).
- Developed a portable hydroponic system and course for elementary students to learn about hydroponic systems.

## Projects

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**Sync-Drive—Client/Server File Transfer over TCP** **OCT 2025–DEC 2025**

- Developed a low-level networking tool in C enabling reliable file transfer using TCP/UDP sockets with Client/Server.
- Implemented compressed transmission supporting both IPv4 and IPv6 addressing for cross-network compatibility
- Managed the project with CMake build configuration and supported a variety of file types (PDFs, GIFs, etc.)

**PCB Planarity Analysis—Graph Theory, PCB Routing, Planarity Testing** **OCT 2025–NOV 2025**

- Modeled printed circuit board trace layouts as graphs and analyzed routing feasibility given planarity/components.
- Implemented planarity testing and routing analysis algorithms to identify valid PCB configurations (non-K3,3).
- Used computational analysis and visualization to evaluate design tradeoffs and inform PCB layout strategies.

**GNN Point Cloud Segmentation—Neural Networks, Point Clouds/LIDAR** **NOV 2025–DEC 2025**

- Modeled 3D point cloud data as graphs to capture spatial and neighborhood relationships for segmentation tasks.
- Implemented graph neural network architectures to learn geometric features and classify point-level structures.
- Evaluated model performance using machine learning metrics to assess segmentation accuracy and training.

**ASCII Shader—Real-Time Rendering, Edge Detection, C#/Unity** **NOV 2024–PRESENT**

- Developed a real-time ASCII shader in C# and Unity, converting visual input into character-based representations.
- Implemented edge detection using Gaussian blurring and gradient filtering to extract image features for mapping.
- Optimized shader performance and visual clarity, enabling smooth updates and high-fidelity ASCII rendering.

## Skills

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**Electrical:** KICAD, Circuit Design + Analysis, Schematic Proficiency, Soldering, PCB Development, Oscilloscope  
**Programming:** C, C++, C#, Java, Python (Pandas), Git/Terminal/Bash, Data Structures+Algorithms, ML, MATLAB  
**Embedded/Hardware:** Arduino, Raspberry Pi, Microcontrollers, Sensors, Signal Processing, Motor Integration.