# Wajahat Mahmood

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## Education

**CUNY Queens College** — Expected Jan 2027
*Bachelor of Science in Computer Science* — *Queens, NY*

- **Relevant Coursework:** Data Structures & Algorithms, Operating Systems, Databases, Software Engineering, Linear Algebra, Probability

## Experience

**Software Engineer Intern, Robotics & Test Automation** — May 2026 – Present
*rf IDEAS, Inc. (RFID/NFC credential reader manufacturer)* — *Schaumburg, IL*

- Automated a 10-hour manual RFID validation process with Python control software for a 6-axis robotic arm, enabling unattended overnight runs and saving ∼20 engineer-hours weekly.
- Built a Python calibration system that sweeps 1,600+ reader configurations per model and scores read success at each point, replacing manual tuning with data-driven selection.
- Developed C++/GTest suites measuring RFID read height to 0.1 mm across 8 orientations and response latency at millisecond resolution, surfacing antenna-alignment defects earlier in the test cycle.
- Hardened unattended runs with workspace validation, joint-limit enforcement, autosave checkpointing, and automated fault recovery, roughly halving overnight runs lost to unrecovered faults.

**Robotics Software Engineering Researcher** — May 2025 – Jul 2025
*University of Michigan, Laboratory for Progress* — *Ann Arbor, MI*

- Co-authored a paper accepted to **IEEE/RSJ IROS 2026** and presented the research at ABRCMS 2025.
- Implemented C++ teleoperation for a Trossen Interbotix RX-200 arm, mapping SDL2 game-controller input to joint-velocity commands through the vendor SDK for reliable remote manipulation.
- Diagnosed and eliminated race conditions crashing the vendor driver by guarding shared state with mutexes and atomics.

## Fellowships

**Google Software Engineering Program (G-SWEP), via Basta** — Jun 2026 – Present

- Selected for one-on-one mentorship from a Google software engineer through a 10-week program covering data structures, algorithms, and technical interview preparation.

**CUNY Tech Prep, Software Engineering Fellow** — Jul 2026 – Present

- Accepted into a year-long full-stack web development fellowship (TypeScript, React/Next.js, Node.js, PostgreSQL) with industry mentorship, code reviews, and agile, TDD, and CI/CD practices.

## Projects

**GlanceScribe** | *Swift, Node.js, Gemini, ElevenLabs, FFmpeg* **Best Healthcare Track, Hack Brooklyn 2026**

- Built an AI medical scribe that turns a clinician's first-person Meta smart-glasses video into structured SOAP notes, eliminating manual note-taking during patient encounters.
- Reverse-engineered the glasses' undocumented streaming protocol to capture live video through a Swift iOS app into a Node.js backend.
- Engineered a multimodal pipeline pairing ElevenLabs transcription with Gemini vision, using schema-constrained JSON decoding so every note parses reliably into the SOAP structure.

**Real-Time Collaborative Code Editor** | *Flask, React, WebSockets, Socket.IO, CI/CD*

- Synchronized concurrent edits and presence across clients over Socket.IO, with server-side session recovery and auto-reconnection so users rejoin mid-session after dropped connections.
- Sandboxed multi-language code execution through the Piston API, isolating untrusted user code from the Flask backend.

## Technical Skills

**Languages:** Python, C++, Java, JavaScript, TypeScript, Swift, SQL
**Robotics & Systems:** ROS 2, multithreading (mutexes, atomics), TCP/UDP sockets, pub/sub architectures, GTest
**Web & Frameworks:** React, Next.js, Node.js, Flask, PostgreSQL, Socket.IO, WebSockets, REST APIs
**AI/ML:** Gemini API, Claude API, multimodal pipelines, structured (schema-constrained) JSON generation
**Tools:** Git, GitHub, Linux, CI/CD, FFmpeg, NumPy, Pandas, SDL2