

# AMRAL BAKSH

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## EDUCATION

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### University at Buffalo

**Bachelor of Science:** Computer Science, Cybersecurity Minor

Buffalo, NY

May 2027

**Relevant Coursework:** Data Structures, Operating Systems, Computer Architecture, Machine Learning

**Awards:** Dean's List (Fall 2023 and Spring 2024)

## PROFESSIONAL EXPERIENCE & INVOLVEMENT

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### SUNY Buffalo Biomedical Engineering Department | Research Assistant | Buffalo, NY      May 2025 - Aug 2025

- Integrated an industrial XIMEA camera into a C#-based OCT imaging system, enabling real-time data capture and hardware-software integration
- Built and optimized performance-critical, multi-threaded data pipelines in a GPU-accelerated system, debugging latency, synchronization, and throughput bottlenecks under real-time constraints.
- Configured and synchronized camera, frame grabber, and DAQ systems for high-speed acquisition under real-time constraints
- Worked within a multi-threaded architecture, debugging timing issues and ensuring reliable data flow

### SUNY Buffalo CSE Department | Team Member | Buffalo, NY

Aug 2025 - Present 2025

- Implemented secure device-to-device communication in a distributed system, focusing on correctness, fault tolerance, and low-latency message passing.
- Designed and extended system components involving cryptographic key management, authentication, and message passing
- Integrated publish/subscribe messaging to support reliable, low-latency communication between system components
- Modified and extended an existing codebase to meet new requirements with minimal performance impact

### SUNY Buffalo Hackathon | Team Member | Buffalo, NY

Nov 2025

- Built and deployed backend services for a real-time web application using Flask and Firebase, designing secure APIs, persistence, and low-latency request handling.
- Designed and implemented secure API endpoints for emotion-aware responses, chat history persistence, and external resource discovery, focusing on reliability, privacy, and low-latency user interaction.

## SKILLS

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**Programming Languages:** C, C++, Python, Java

**Systems and Infrastructure:** Multithreading, Concurrency, Memory Management, Real-Time Systems, CUDA

**Data & Applied Machine Learning:** Machine Learning & Generative AI: Model evaluation, feature extraction & preprocessing, performance analysis; experience integrating AI models into production services

**Tools:** Git, Linux, Secure communication protocols, Publish/ Subscribe messaging

## PROJECTS

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**Multi-pool Memory Allocator** - Implemented a custom C memory allocator to reduce fragmentation and improve allocation efficiency in performance-sensitive systems.

**Conway's Game of Life Implementation**- Developed Conway's Game of Life in C with efficient grid updates

**Instant Messenger Application** – Built a C-based instant messaging app with custom packet encoding and decoding

**Personal Portfolio Website** – Developed a responsive personal portfolio website using HTML, JavaScript, and CSS