

BARON LI

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PROJECTS

Web server & Streaming Platform | Python, Docker, MongoDB, WebSockets, FFmpeg January 2026 - May 2026

- Engineered a multi-threaded HTTP/1.1 web server from scratch using Python TCP sockets, building custom network parsers to process raw byte streams and multipart data.
- Implemented the complete WebSocket protocol RFC from the ground up, engineering the SHA-1 cryptographic handshake and payload masking to support a real-time, multi-user drawing board.
- Architected a robust user authentication pipeline using *bcrypt* for password hashing, SHA-256 cryptographic handshake for secure session tokens, and integrated TOTP two-factor authentication (2FA)
- Integrated FFmpeg to engineer an Adaptive Bitrate Streaming (ABR) pipeline, transcoding MP4 video uploads into HTTP Live Streaming (HLS) formats, and automatically capturing thumbnails.

Karaoke Web Platform | React, Tailwind CSS, Howler.js, Web Audio API December 2025

- Developed a responsive web application featuring real-time lyric synchronization and dual-track audio playback (instrumental/vocals).
- Engineered a custom audio hook using Howler.js and the Web Audio API to manipulate GainNodes, allowing independent volume mixing for vocal and instrumental tracks.
- Built a custom RegEx parser to process LRC lyric files and render them into an auto-scrolling teleprompter utilizing React Refs for smooth DOM manipulation.
- Integrated a backend endpoint to dynamically fetch, process, and ingest YouTube links as playable karaoke tracks.

RecipeByte | HTML, JS, PHP, CSS, MySQL, Git, Apache Server August 2025 - December 2025

- A dynamic, responsive web application designed for a software engineering course, allowing users to share and discover new recipes within a community-driven platform
- Engineered a secure, full-stack user authentication system featuring registration, login, and a complete password reset workflow using PHP and MySQL
- Created an interactive recipe browsing page with features for search and filtering using JavaScript DOM manipulation
- Developed dynamic and responsive user interface with HTML, CSS, and client-side JavaScript for seamless user experience across desktop and mobile devices.

Conway's Game of Life | C August 2024.

- Engineered core logic for cell state transitions using Conway's rules, emphasizing efficient handling of multi-dimensional arrays and precise output formatting.

Smart Home Automation | Oracle VM June 2020

- Integrated smart lights and smart switches into a centralized home automation system using Home Assistant
- Deployed Home Assistant on a virtual machine to allow scalable system management and enable additional service integrations
- Configured NFC tags to control individual lights and switches, enabling one-tap activation/deactivation via physical cards to allow fast and easy usage.

EXPERIENCE

Teachers' Assistant June 2021 – August 2021

Police Athletic League Queens, NY

- Reinforced the instructions taught in the classroom to 30+ students. Reviewing and assisting with lessons with students and answering any questions. Supervise students outside the classroom during lunchtime, field trips, and recess.

EDUCATION

University At Buffalo - School of Engineering And Applied Science Buffalo, NY

Computer Science August 2023 – May 2027

TECHNICAL SKILLS

Languages: Java, C/C++, Python, OCaml, PHP, MySQL, JavaScript, HTML

Development/Frameworks: React, Tailwind CSS, Docker, MongoDB, WebSockets, Apache, Web Audio API

Tools: Git, VS Code, IntelliJ, Linux/Unix, FFmpeg, Nginx

Certifications: Google Data Analytics