Braden Everson

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SUMMARY

Dedicated Software Engineering Intern at Cognex Corporation with hands-on experience in full stack development and embedded systems. Strong background in Rust, C, C++, with a focus on embedded systems that make a difference for the world. Passionate about roles involving embedded systems, firmware development, systems level design, and leveraging Rust for high-performance, thread-safe applications. Actively seeking opportunities that align with career goals of contributing to impactful, real-world solutions in cutting-edge technology fields.

EDUCATION

B.S. Computer Science | Milwaukee School of Engineering | GPA: 3.93 | Exp. 06/2027

M.S. Machine Learning | Milwaukee School of Engineering | Exp. 12/2027

INTERNSHIP EXPERIENCE

Cognex Corporation – Software Engineering Intern **May 2024 – Present**

- Researched and integrating Rust into a large CMake-based C++/C codebase, replacing an in-house HTTP server implementation responsible for multiple user-facing crashes due to memory related issues.
- Utilized the Corrosion crate and cxx for seamless C++ and Rust interoperability, ensuring smooth integration into the existing codebase.
- Leveraging Rust's memory safety to architect a robust and crash-resistant HTTP server, improving system stability while maintaining performance deltas.
- Implemented WebSocket upgrade protocols in Rust, enabling more modern features within the server.
- Utilized asynchronous Rust for thread-safe, optimized server management, ensuring efficient handling of multiple connections.
- Developed and executed unit and integration tests in both Rust and C++ to validate compatibility with existing FFI consumers.
- Reported daily findings and progress to scrum team of engineers.

HIR Wellness Institute – Mobile App Developer Intern **September 2023 – December 2023**

- Developed React Native mobile application for internal company scheduling of interns.
- Created interface between Firebase NoSQL database and React Native frontend.
- Created database schema depicting hierarchy of users with varying rights and access levels.
- Implemented Google Maps and Apple Maps API to create a real time map of all nearby events posted by administrators.

FitX On Demand – Full Stack .NET Developer Intern **January 2023 – August 2023**

- Developed cloud based IoT solution for remote access QR codes that can scan into fitness content.
- Implemented secure zone identifier that bans video access if scan location is out of range from the designated hotel/gym.
- Leveraged AWS s3 buckets to host video content securely with limited endpoints open.
- Developed data visualization through QR code scan location statistics on a map along with dynamic QR code disabling based on how much variety these scan locations carried.

BrightBean Labs – Full Stack .NET Contract Developer **November 2020 – January 2023**

- Developed Asp.Net web applications and Xamarin Forms mobile applications for clients seeking unique software solutions in the
  .Net space.
- Developed Denver Health DHREM scheduling platform: an Asp.Net built application providing continuously integrated scheduling services in real time for Denver Health resident interns.
- Used Xamarin forms and MVC architecture to develop an IoT mobile solution for smart truck engine warmers that could be dynamically controlled through the app.

PERSONAL PROJECT EXPERIENCE

Project Earthmover | Team of 6 **September 2024 – Present**

- Developing an embedded reinforcement learning platform with modular reward structures linked to various peripherals.
- Architecting and developing high performance heavy simulation service for executing generic physics-informed simulation tasks. Currently benchmarked to run up to 1,000,000 concurrent physics simulations on MSOE's ROSIE Supercomputer.
- Utilized a modular architecture to facilitate easy integration with both cloud and local hardware components

Open-Source Machine Learning Rust Library | Independent to Team of 3 **October 2023 - Present**

- Led the development of the Unda machine learning library in Rust, designed for efficient execution of machine learning workloads.
- Engineered an intermediate API for constructing neural networks using a sequence of computation nodes within a custom compute graph.
- Integrated XLA bindings in Rust to dynamically compile and optimize compute graphs for accelerated execution.
- Developed a high-level API to facilitate the creation of supervised machine learning models, with ongoing work on unsupervised and generative models.
- Developed continuous integration and unit tests to ensure behavior is as expected. Set up CI for contributors enforcing passing tests before merging into main.
- Unda achieved 4th place out of about 50 contestants in the 2024 MSOE ROSIE Supercomputer Challenge, demonstrating its effectiveness in large-scale embedded ML tasks.

Real Time Multiplayer Web Game from Scratch | Independent **July 2024 – August 2024**

- Developed a real-time, WebSocket-enabled tower defense game with a focus on multiplayer interactions.
- Utilized Rust and TypeScript to provide a robust backend server and a responsive gameplay experience on the frontend.
- Utilized Asynchronous Rust runtimes in a performant and optimized manner to ensure scalable connection handling.
- Implemented a WebSocket server in Rust to handle real-time game state synchronization across multiple clients.
- Designed an asynchronous server flow optimized for performance and low latency in a multiplayer environment.
- Created a protocol built from WebSockets to convey important game information using Rust's algebraic types that could map via serialized binary to TypeScript objects.
- Utilized TypeScript for the frontend to manage game state, render animations, and handle user inputs on an HTML5 canvas.

Multiplayer Uno in the Terminal | Independent **July 2024 – July 2024**

- Developed a WebSocket-based server for playing Uno, written in Rust to ensure high performance and low latency.
- Implemented the game logic, including rules enforcement and turn management, in a scalable, event-driven architecture.
- Integrated with a custom WebSocket client to provide a seamless multiplayer Uno experience.
- Developed an intuitive and charming TUI for playing Uno directly from the terminal.

Static Website Generation CLI Tool | Independent **June 2024 – June 2024**

- Developed SiteSmith, a Rust-based CLI tool that automates the generation of personal websites using JSON-formatted project and work experience data.Implemented the game logic, including rules enforcement and turn management, in a scalable, event-driven architecture.
- Implemented features for parsing JSON data and generating HTML websites from customizable templates.
- Published the tool on crates.io, making it publicly available for developers seeking to automate the creation of personal websites.
- Utilized the tool for the static generation of my personal website.

OPEN-SOURCE CONTRIBUTION

St Jude Rust Labs – Bioinformatics Toolchains and Execution Engines

- Working alongside St Jude software engineers on the Crankshaft project, a headless task execution engine in Rust capable of performing concurrent workflow tasks on local, HPC and Cloud-based systems with the goal of making large scale bioinformatics processing accessible and efficient.
- Developed backend-agnostic configuration service in which backend behavior could be completely decided by a .toml configuration file. Utilized this format to create an HPC backend that can submit jobs to a cluster.
- Competed and presented Crankshaft as a part of the St Jude KIDS24 BioHackathon, where Crankshaft was ranked in the top 6 of final projects.