Kennett Puerto

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Experience

Graduate Research Assistant: *Bosque Tools Developer*

- As part of a Microsoft Research project under the Bosque Programming Language, developed an SMT extraction plugin that **increased automated test coverage from 95% to 99%** by integrating the **Satisfiability Modulo Theory** on Bosque's AI-driven test generation pipeline, improving edge case detection and software reliability. Designed and implemented the **Language Server Protocol** (LSP) and **Tree-sitter syntax highlighter**, boosting developer productivity. **Collaborated with a 5-person research team**, that focused on tooling and testing innovations for next-generation programming paradigms. **Technologies used:** C/C++, Z3, SMT, Boost, Go, Tree-sitter, CNF Grammar.

Undergraduate Research Assistant: *Entomology Tools Developer*

- Led a 3-person team in the design and development of low-power embedded systems for real-time temperature monitoring in beehives. Designed and implemented battery-efficient hardware capable of operating for up to a week, with integrated wireless communication for live data transmission to cloud servers via micro services such as **AWS IoT Core** and **AWS Lambda**. Developed the software pipeline using **Python**, **NumPy**, and **Plotly** to process and visualize incoming sensor data in 4D graph, enabling real-time monitoring of hive conditions. The visualization system achieved **98% accuracy temperature prediction** in simulating actual hive environments that are two hours in the future. These insights enabled the creation of early-warning systems that helped farmers detect issues such as bee illness or structural leaks, reducing hive losses significantly for honey farmers. **Technologies used**: Python, NumPy, Plotly, SQL, AWS IoT Core, AWS Lambda, MQTT, embedded C/C++, low-power micro controllers

Projects

Zig Language Server: *Serpentine*

- Developed as a proof of concept for the Zig programming language, this Language Server brings modern IDE capabilities to any text editor that adheres to the Language Server Protocol (**LSP**). Built with Go and following the official LSP specification, it enables a seamless developer experience across multiple environments. The supported capabilities are, Go to Definition support, Intelligent Code Completion Basic Code Actions, Real-time Diagnostics and Error Reporting. This server is compatible with a wide range of editors including VSCode, Sublime Text, Neovim/Vim, Atom, Emacs, Kate, Helix, Zed, and more — effectively transforming them into full-featured Zig IDEs.

Game Engine: *Urigin Engine*

- This is a cross-platform game engine designed with a focus on retro and embedded systems, currently capable of compiling games for both the Nintendo 3DS and Sony PSP. It features two core rendering algorithms—ray tracing and rasterization —and supports a range of essential graphics and gameplay systems including model loading, hierarchical scene trees, UV-based texture mapping, back-face culling, quaternion-based rotations, procedural terrain generation, and near-plane clipping. The engine is built with minimal dependencies, relying only on **C/C++**, **SDL**, and **Zig**, making it lightweight, portable, and highly extensible for developers targeting unconventional or constrained platforms.

Personal Portfolio Website

- Personal Portfolio website. Used mainly as an experimenting page to learn web frameworks. This website has been recreated using multiple javascript and typescript frameworks. **NextJS**, **REACT**, **Svelte**, and currently running the most basics **Deno**, **HTML**, **CSS**, **Javascript** and **Node.js**.

Education

University of Kentucky: *Master's Degree* 2024-2026

Kentucky State University: *Bachelors Degree* 2020-2024

Skills

Programming Languages: C/C++, Python, Zig, Lua, JavaScript, Go, Java, Bosque, Bash

Tools: Linux, Windows Development, Django, React Native, Next Js, AWS

Platforms: Linux, Windows, Embedded Systems