Grayson Clark

Portfolio: faultypine.github.io
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Experience

- **ThirdPixel Interactive - Smack Studio** — Remote - Contractual
  Netcode Consultant — *Febuary 2022 - Present*
  - **Meetings**: Attending meetings with a team of around 10 people and answer questions about Rollback Netcode
  - **Codebase Analysis**: Analyzing the team's codebase to provide advice about recommended project architecture
- **Indiana University Bloomington** — In-Person
  Undergraduate Instructor — *August 2022 - Present*
  Selected by faculty as 1 of 8 students from a class of 300+
  - **Team Meetings**: Attending meetings with other TAs and professors to coordinate schedules and creating assignments for students
  - **Documentation**: Documenting and reviewing assignment code
  - **Grading**: Grade and proofread student code for errors, misunderstandings, or failed tests
- **Deerfield Park District** — In-Person - Seasonal
  Camp Counslor — *May 2015 - July 2021*
  - Led and was responsible for a group of 13 kids throughout a 3 month period
  - Coordinated and led group activities for campers and counselors
  - Helped campers build confidence and self-esteem through consistent guidance and mentoring
  - Collaborated with staff to establish and maintain supportive and structured environment
  - Maintained effective consistent communication with parents and families

Projects

- **Brawlback - multiplayer client (Deterministic Lockstep, Speculative Execution, Client Synchronization, Peer-To-Peer Networking)**: (Work in Progress) Peer-To-Peer Networking client for Super Smash Bros Brawl with Integrated Matchmaking that allows players to instantly play with each other even in volatile or poor network conditions. Written in C++ and PowerPC Assembly
- **Tiny Engine - simple game and game engine/framework (C++, OpenGL)**: Created a lightweight framework of APIs wrapping OpenGL and GLFW for videogames programming. Features include hardware-accelerated rendering, debug shape drawing, spritesheet parsing/animation, 3D mesh (.obj) loading/rendering, shader API, postprocessing, and a simple job system for easy multithreading.
- **HewDraw Remix - overhaul modification (Rust, Code Injection)**: (Formerly lead developer) open source modification of Super Smash Bros Ultimate. Major contributions included a full rewrite of the codebase from C++ to Rust in a 2 month period, a Continuous Deployment system, and a user-facing launcher/updater application. Currently we have around 25 contributors and 4000 active players. The project is composed of approximately 100,000 lines of Rust, as well as python scripts for automating various tasks and infrastructure
- **UltimateModShop - User-facing shop/management app (GUI, Web API, Embedded Software)**: a homebrew application written in C++ for the Nintendo Switch that allows users to download, install, and manage Smash Ultimate mods directly on their switch, using the GameBanana web API.
- **Reverse Engineering / Skyline Plugins (Embedded Software, Reverse Engineering, Code Injection)**: Utilized deep knowledge of C++/Assembly and an intuition for common code practices to Reverse Engineer parts of the Super Smash Bros Brawl Super Smash Bros Ultimate executables. Interfaced with the Nintendo Switch's developer SDK to perform file IO, networking, etc. Used Reverse Engineered code and the Skyline library to properly perform code injections and overwrite game behavior with our desired behavior. Written in Rust. Here is a link to some small projects. And a link to HewDraw Remix
- **Wave Function Collapse Algorithm Visualizer (Algorithms, Data Structures)**: Implemented the Wave Function Collapse algorithm in JavaScript
- **Unity Projects - game development (Unity, Shaders, Rendering)**: Created various Unity projects that recreate game mechanics from popular games. Includes Cel Shading, Particle Systems, UI Integration, Image Effect Shaders, Water Shaders
- **Solary - game development (Unity, Shaders, Procedural Generation)**: Created a physically accurate solar system simulation with procedurally generated planets.

Education

- **Indiana University** — Bloomington, Indiana
  Bachelor of Science - Computer Science; GPA: 3.7 — *August 2020 - June 2024*
  Courses: *Data Structures and Algorithms, Discrete Structures, C#, Python, Java*

Skills Summary

- **Languages**: C++, Python, C, Rust, C#, HTML/CSS, Java, JavaScript
- **Platforms**: Windows, Linux, Web, Raspberry
- **Skills**: GIT, GDB, AWS, WSL, Valgrind, GCC/G++, Unit Testing/TDD, CI/CD, Perforce, Ghidra
- **Soft Skills**: Communication, Organization, Time Management, Conflict Resolution, Cooperation