Jonathan Bogie

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Portfolio: *https://jonathanbogie.me* **GitHub:** *https://github.com/rukadev* **LinkedIn:** *https://linkedin.com/in/jonathanbogie*

Education

Bachelor of Science in Computer Science, University of Oregon, OR, USA MGPA 3.75 | 2020 - Present
Minor in Mathematics

Relevant Coursework

Data Structures and Algorithms, Linear Algebra, Discrete Mathematics, Computer Organization, Web Development, Data Science I, Data Science II, Software Engineering, Intermed Algorithms, C/C++ and Unix

Skills

- Programming Languages: C++, C, Python, Lua, Java, JavaScript, PHP
- Platform/OS: Unix, Windows
- Revision Control: Git, Subversion
- Frameworks & Applications: Apache, React, Angular, Django, Pandas, NumPy

Projects

- **Cyclone Culling**: Designed and implemented a culling system to dynamically render objects in 3D space according to proximity. The logic is split into a broad search, which utilizes **octree spatial partitioning** to instantiate objects, and a narrow search, which defines **level of detail**. Includes documentation.
- **Elixir2D Framework:** An open-source **framework** for HTML5 powered **web games**. Provides technical features such as handling input, collisions, sprites, and **rendering**, as well as offering common gameplay mechanics at your disposal.
- **Scaler Building System:** Built a system that detects user-input to construct, edit, color, and texture user-generated structures. Touches on **computational geometric** and **algebraic** concepts such as triangulation, straight skeletons, vectors, and matrices.
- **DejaVu Map Editor:** A modular, template-based approach to designing large scale static maps and scenes to reduce memory usage. Closely follows the **flyweight design pattern** to reduce memory. Includes documentation.
- **Game Portfolio Site**: Updated and fused an existing website with my **Elixir2D framework** to create a portfolio website that features level-based mini games to unlock sections of site content.
- **Computer Architecture Model:** Modeled a basic computer inspired by the **ARM instruction set** architecture, featuring a CPU, general purpose and specialized registers, codes for operations, and a fetch/decode/execution cycle.
- **Polygon Triangulation**: Built an algorithm to partition a polygonal area into triangles by the **ear-clipping algorithm**, with support for concave polygons through a **gift-wrapping algorithm**.
- **Lossless Data Compression:** Constructed an algorithm to compress **JSON** encoded packets using **LZW compression** to effectively detect and store common present and past string occurrences.
- **Compartmental Modeling:** Designed an **SIR model** to simulate the transition of individuals within a population from states that range from susceptibility, infection, and recovery.

Experience

- **Google Developer Student Club** October 2022 - Present
  Collaborated with students to gain technical skills through hands-on workshops using various Google API.
- **Game Development Club** November 2021 - Present
  Worked together and individually to create, publish, and learn about video games with peers.