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Unity Developer

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Video Game Projects

The following projects were designed and developed entirely by me in Unity (C#):

- **The Room** (mobile; 2019) → **Suspenseful 3D VR** shooter about a user escaping and combating demonic corruption.
  - Used Editor scripting and SerializedObjects to facilitate the loading, editing and saving of level lighting presets to speed up iteration for levels containing many different light sources.
  - Used both **real time and baked lighting sources**, and used camera preprocessing to make baked light look dynamic.
  - **Built raycasting script** to generate (and visualize, when debugging) paths of bouncing projectiles that are guaranteed to hit or miss the player by a certain degree. Used to implement a difficulty curve for a level that seems run only by chance.
- **Aqua Chase** (mobile; 2019) → **Aquatic arcade scroller** with custom 2D water and buoyancy physics.
  - Implemented **custom object buoyancy** for custom water mesh to avoid the use of expensive Mesh Colliders and Buoyancy Effectors. System used **extendible state machines** that depended on the relative positions and slopes of the mesh's nearby vertices.
  - Game has a basic day and night cycle (created by fading in and out different layers of backgrounds) to remove monotony in the gameplay experience.
- **Seesaw Balance** (mobile; 2018) → **3D arcade game** about tiling a ball on a seesaw through obstacles.
- **_ong** (mobile; 2018) → **Minimalist arcade local multiplayer** *Pong*-based game that supports bot opponents.
- **Detonate** (PC; 2018) → Game jam **bullet hell** with procedural dungeon level generation and A* enemy pathfinding.
  - **Procedural level generation** was implemented on Tilemaps using drunken walk algorithm, allowing for more interesting levels with combinations of long hallways and large irregularly shaped rooms.
- **Box Bomber** (mobile; 2017) → **2D arcade space shooter** about saving a nuclear payload from aliens
  - Integrated **gameplay recording** and sharing via Everyplay to encourage the creation of an online community.
  - Game has a circular Polygon Collider based animated power-up selection menu inspired by Witcher 3. This custom layout allowed for users to select from a variety of power ups without slowing down the gameplay experience.
  - User feedback on the complexity and difficulty of the game taught me about the disconnect between the developer's and the user's experience with videogames; taught me to take iterative playtesting more seriously.
- **Dimension Dash** (mobile; 2016) → An infinite runner based on Sonic with different levels and a boss battle
  - Game gathered over **750k downloads** during its two years on the Google Play Store.
  - Version 2 expanded the game by adding **in-game currency and purchasable players** & levels to increase user engagement.

Aqua Chase, Seesaw Balance, _ong and Box Bomber were **published in collaboration with Voodoo Publishing** (about 100-200 downloads each); those 4 games and Dimension Dash also had Game Center and Google Play Leaderboard integration.

All games also made use of important **game feel additions** like camera preprocessing and shaking, custom 2D and 3D particle systems and sound effects. The development of each of these games also required extensive use of tools like **Illustrator**, **Photoshop** and **Audacity** to create my own assets and edit other people's assets.

Other Software Projects

- I have **C experience** from a systems class (involved multithreaded programming and debugging) and **C++ experience** from a graphics class (involves programming object tessellation, scene composition and rendering, raycasting).
- I designed, programmed (full stack) and branded a feature-complete React Native social media application that involved heavy use of Firebase (FCM, Realtime Database, Cloud Functions, Firestore), including the creation of several interrelated Google Cloud Functions and Triggers. Became maintainer of heavily used react-native-firebase npm package.