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GALACTIC GETAWAY

DarkSpace Studios

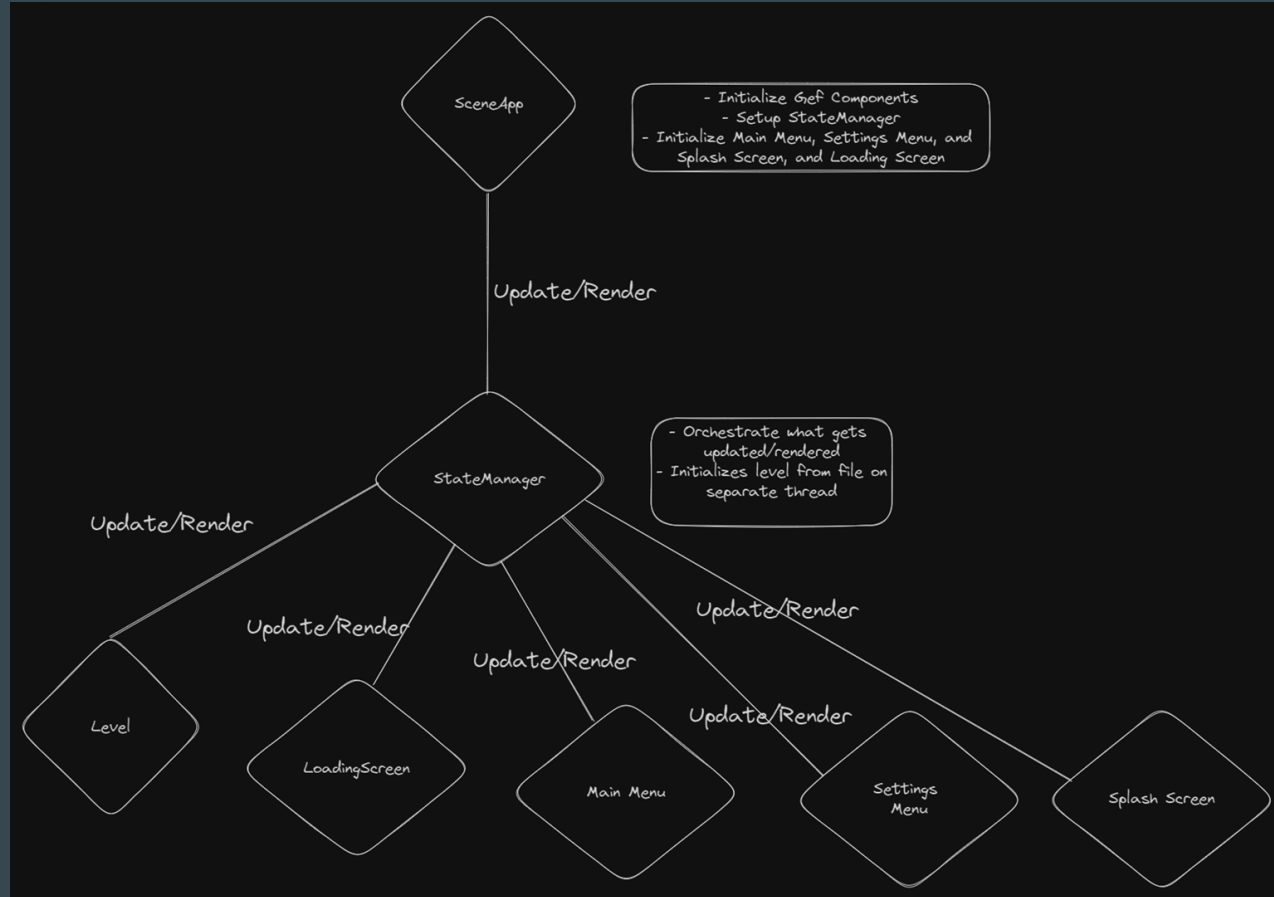
User Guide

- Movement: A/D, Left Stick
- Jump: Space, Cross
- Gravity Lock: F, Triangle
- Change Gravity Direction: Arrow keys, D-Pad
- Gravity Strength: Q/E, R1/L1
- Fire: LMB, R2
- Reload: R, Square
- Pause: ESC, Options/Start
- Complete Level: X, Circle

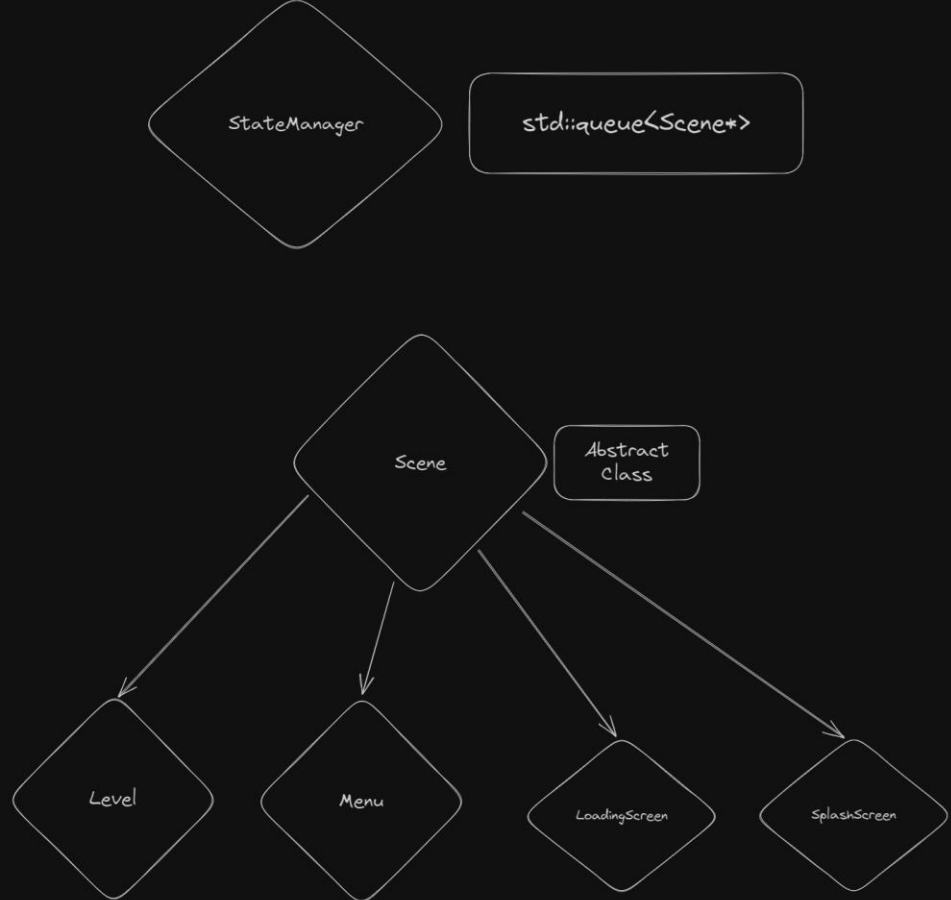
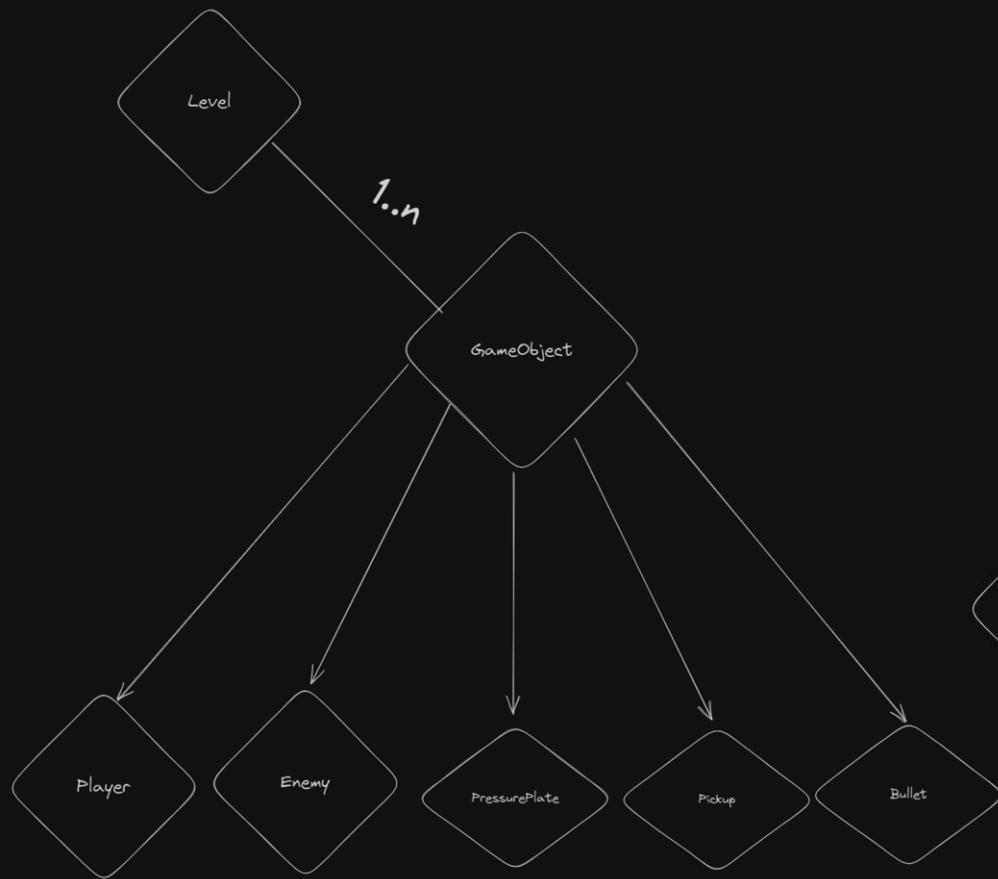
Introduction - Features

- Gravity changing mechanics
- Puzzle mechanics
- PvE mechanics
- Pickups
- Physics and collision resolution
- Animated sprites and meshes
- Various SFX
- Intuitive UI System

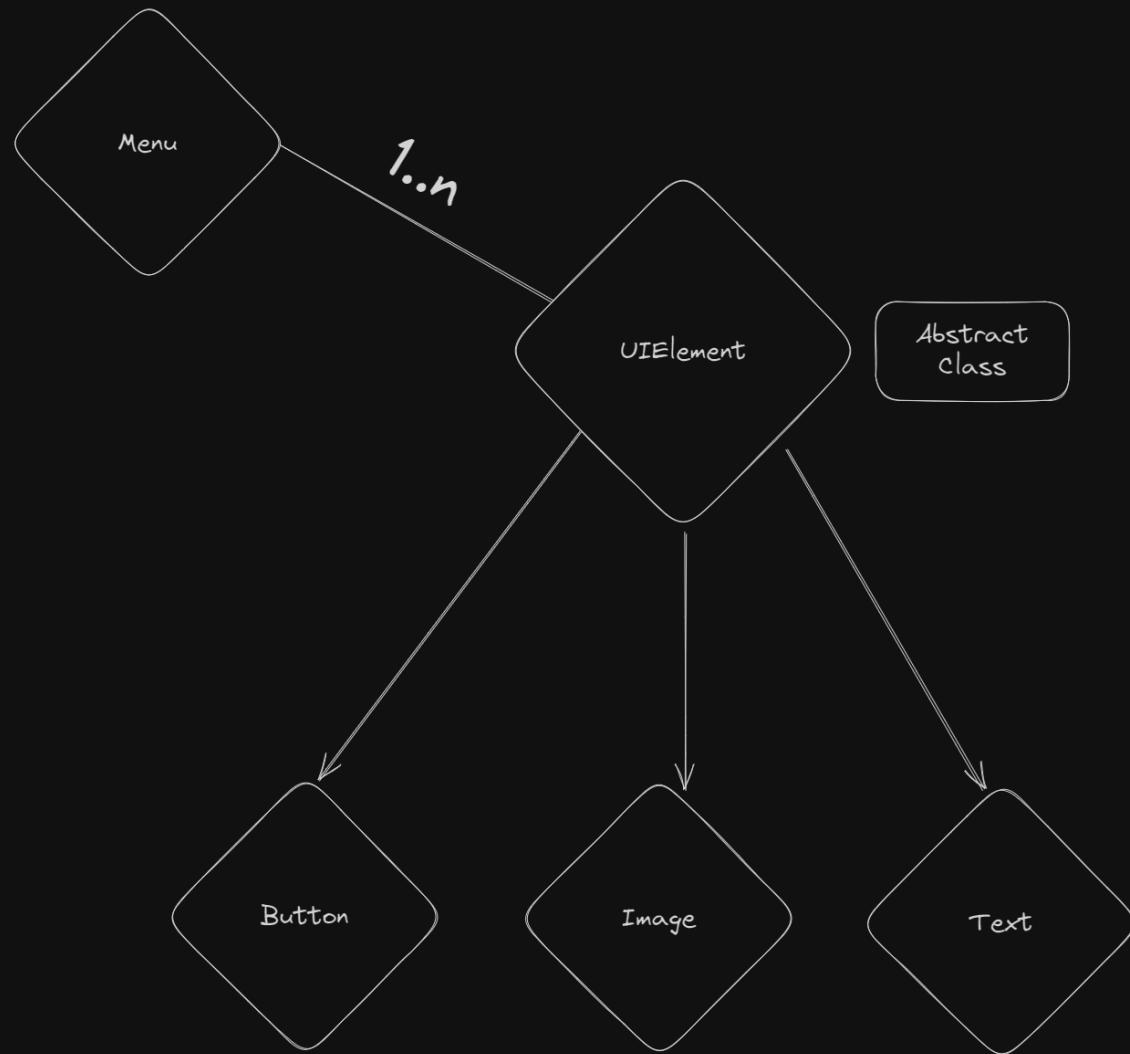
Application Design



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Techniques Used

- Load levels from JSON files which are editable with Tiled
- Custom input system: action-bindings loaded from file
- Lambda callbacks for Buttons and Pressure Plate
- Multithreading for loading screen
- Class-based & switch-based state machines
- Intuitive UI System

Data Oriented Design

- Modern CPUs have caches which accelerate accessing data stored contiguously in memory
- Data locality is hard to achieve with OOP since every object gets initialized in memory separately everytime we use the “new” keyword.
- Ditch OOP
- Programming in Rust would make achieving data locality even easier.

Cohesion

- Overall our program is fairly cohesive.
- The cohesion of scene_app.cpp could be improved as due to time constraints it became a dumping ground for last minute additions.
- Could be improved by moving the code for loading audio and UI into separate classes.
- With a larger team and more time, more thought would go into the design from the start of development. This also goes for our next point...

Coupling

- Pretty much everything is tightly coupled
- We are passing a lot of data through our pipeline: Platform, AudioManager etc.
- It is up to the other classes to make sure that this data is safe to use
- This has made refactoring very painful
 - Eg. when we wanted to implement Audio, we had to edit most classes so that they all held a reference

Reflection

- Most of the final game was in the original plan
 - There are a few features such as pressure plates and doors which weren't in the pitch
 - And there were some features, such as a grappling hook and use of gravity to harm enemies, that we couldn't get done in time without sacrificing the quality and overall polish of the game
- What went well
 - Strong team communication
 - We each knew who was doing what, and were communicative during the development cycle
 - Good use of git
 - Lots of frequent commits as opposed to few large ones. Which meant merge conflicts were never too big
 - Good use of OOP
 - Overall the game looks good and is well polished

Reflection

- What went wrong
 - Code got more difficult to maintain as development went on due to our design being tightly coupled
 - Time management could have been better
- If we could start again
 - Consider ditching OOP practices in favor of a data-oriented paradigm
 - Inheritance, specifically virtual functions, got in the way of GameObject children.
 - Use smart pointers

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