Abound

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04/26/2024

Introduction

Abound aims to be a sandbox role-playing game inspired by the niche game Starbound. What you see are the beginnings of a years-long endeavor to learn from the successes and failures of Starbound and build a game that achieves the goals it ultimately failed to meet.

Challenges
SDL2 and OpenGL

The documentation and tutorials for SDL2 were often out of date, or were not made to be platform agnostic which is one of SDL2's strengths. Many of the OpenGL tutorials were made for an older version of OpenGL that used a different rendering pipeline that is incompatible with newer versions of OpenGL. This caused issues when utilizing SDL2's OpenGL context resulting in us having to implement our own rendering context.

Text Rendering

Documentation for text rendering utilizing OpenGL was years old and out of date. As a result, implementation ultimately came down to significant trial and error with little guidance provided by the API and documentation on root causes for different issues.

Gallery

Screenshot below depicts some of what is possible with the current building system

World Generation

As seen below, world generation takes place in 5 phases. The first phase is generating the surface of the world using 2D perlin noise sampled in a circle, phase 2 is generating caves using turbulent perlin noise, phases 3 and 4 run cellular automata on the caves to smooth them out, and phase 5 generates a variable width layer of dirt with grass on top

Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
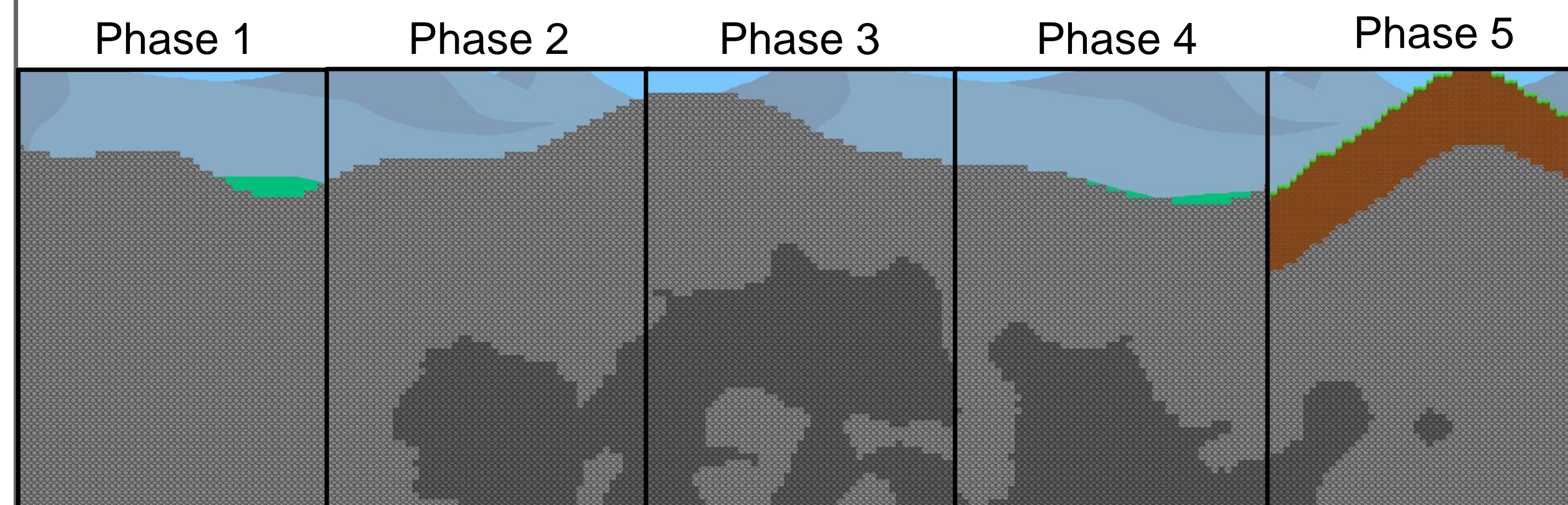
Lessons Learned

SDL2 does not natively support and actively discourages multithreading implementation of API functions, this has reduced our ability to create an efficient framework and implicitly limits performance optimizations.

Rendering parallaxes can be simplified using shaders to automatically wrap the parallax so no logic is needed to displace the parallax layer each time you reach the edge.

Future Goals

Multi-threading support
Rendering pipeline overhaul
Multiple save games and characters
Inventory with item crafting
Hostile and friendly entities
Multiplayer support
Lighting

Acknowledgements

Anthony van Weel for creating the art,
Andrew Tyler for the ingame font,
Patrick de Arteaga for the music,
Dr. Kenrick Mock for his mentorship,
And our family and friends for play testing