Overview

Void Raiders is a shooter for the PC, where players take on the role of a mercenary pilot tasked with destroying create procedurally generated space stations. The player will need to act quickly to avoid the station's defences, all the while blasting through its outer hull to reach and destroy the power core.

Aim and Objectives

The aim of this project is to create a 3D shooter which challenges players to destroy randomly generated space stations. The stations will be spawned around a power core, the destruction of which is considered the end-goal of the player. Segments of the station are destructible, allowing the player to develop their own strategy for reaching the core.

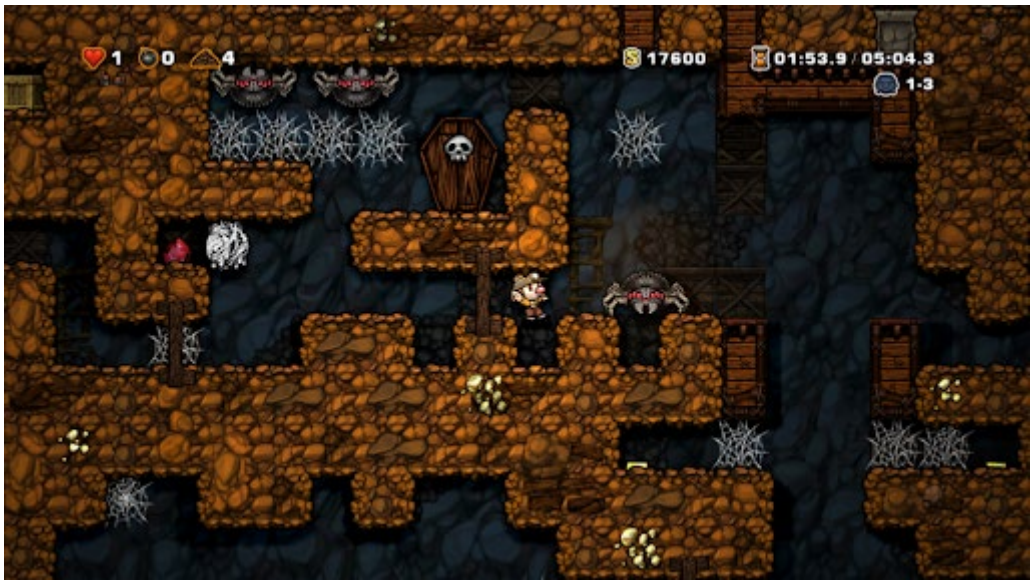
- Create a 3D environment containing a seed-block (space-station core).
- Have randomly selected station segments propagate from the seed, each providing a specific challenge for the player to overcome which varies between playthroughs.
- Provide feedback through a time and destruction-based scoring system.

Competitive Analysis

Other games were examined with two intentions, to identify titles which have developed technical solutions to similar challenges, and to source thematic inspiration for the desired player experience.

Technical Solutions

Spelunky



Spelunky is a 2D rouge-like platformer, developed by Derek Yu, which places a heavy emphasis on procedurally generated levels for each playthrough. However, Spelunky adopts a middle ground between pure random placement of its components, and developer-created levels, to create a game which feels different on each run yet possesses a level of consistency. As outlined by GMTK, each level is divided into a 4x4 grid of rooms, a random room on the row is selected as the start point, a path through the level is created by randomly selecting neighbours until an attempt is made to move below the bottom row, at which point an exit room is placed. The rooms are then populated with a

series of prefabricated templates, which in turn randomly generate environments around room-specific static elements (ladders, shops, negative space, etc).

The result is a level of consistent length, which can be navigated without special tools, and contains unique set pieces such as treasure rooms and traps, yet still appears random. Similar methods include the 'Lots' system in X-Com 2 (empty spaces on a map are filled with prefabricated parts), and Dead Cells (prefabricated rooms are added until a quota is reached).

I intend on using the principles of this system as the basis for creating space stations which vary between runs yet still feel consistent.

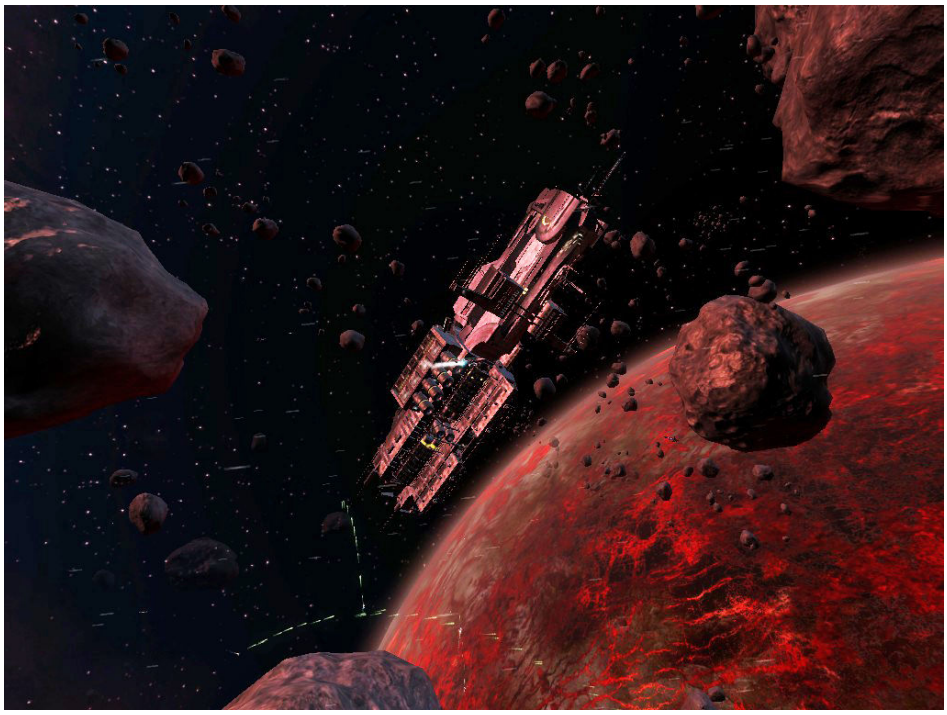
Halo

The first-person shooter Halo features the option to track performance through a scoring system. While defeating foes in as efficient a manner as possible is the main source of points, each level has a time-based 'par'; complete a level below par and the end score increased by a bonus multiplier, finishing above par has the opposite effect. Combined with a multiplier which scales with difficulty, this encourages players to adopt a risky, aggressive playstyle in order to complete a level as quickly as possible against more dangerous enemies in return for a greater reward.

It is my intention to make the station fully destructible and reward the player for destroying individual components. A time-based multiplier will encourage the player to pursue the goal of destroying the station's core in order to maximise their score.

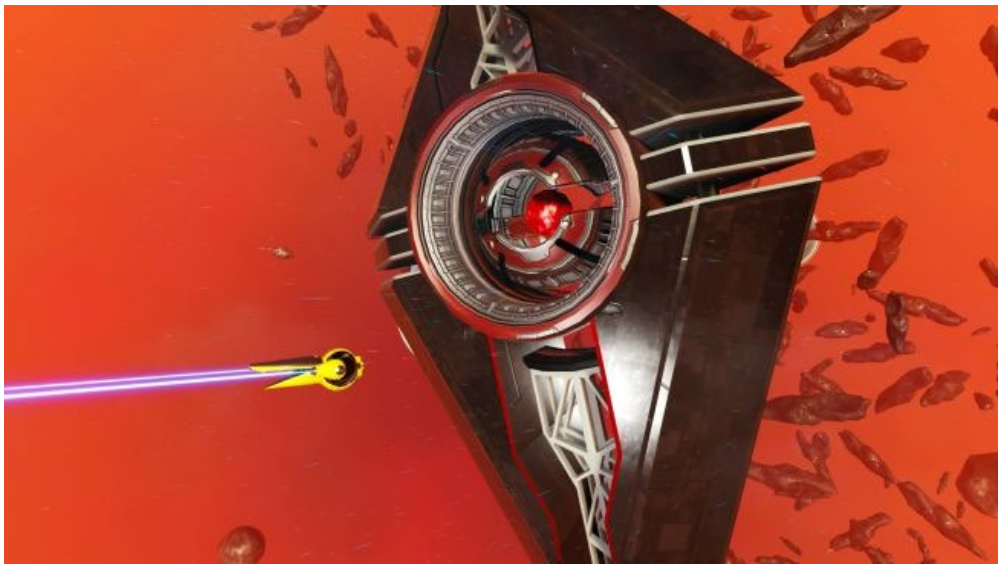
Thematic Inspiration

X3



X3 is a space-based rpg similar to Elite, Eve: Online, and No Man's Sky. Players interact with the game while in the cockpit of their own spaceship. My experience of the gameplay formed the basis of the desired user experience and provided some insight into how the control system might work.

No Man's Sky



Like X3, No Man's Sky provided inspiration for basing the game around colossal space stations. Although discontinued as an idea due to time constraints, the random generation of asteroids and other debris around the station was also considered and could provide cover to the player as they fight the defences.

Other Media

Star Wars was considered when developing the desired player experience. I seek to capture the thrill of the trench runs, turning the station's size against it as the player makes their way to the central core.

Technical Challenges

- Implementing the use of joints to bind structures together.
- Ensuring that structure do not overlap and recognise when they should interact with their neighbours (internal access).
- Random placement of components in each prefab for variance.

Proposed Solution

- Develop a library of prefabricated sections, which can be used to build out the station. Each part of a section is connected to its neighbours by joints.
- Each section is joined to its neighbours by a small number of structural 'beams'. This should reduce the number of calculations across the station, as these forces are transferred through the beams.
- 'Nodes' in a section can be used to randomly place components: gun turrets have predictable placement points on a section but are not guaranteed to be spawned. The placement is controlled via script and takes place when a section is instantiated.

References

http://www.hardcoregaming101.net/spelunky/

https://www.youtube.com/watch?v=Uqk5Zf0tw3o

https://www.gamewatcher.com/games/x3-terran-conflict/screens#

https://www.pcgamer.com/space-skulls-sentient-gas-and-other-weird-things-weve-found-in-the-no-mans-sky-update/