



Preliminary Design Review

Demon & Alien Spawn
Sponsored by Polymorphic Games



Project Needs

Design an evolutionary virtual reality video game based on a classic arcade game and suitable for being used as a five minute demo at Polymorphic Games outreach events.





Project Specifications

Specification:	Functionality:
Game Management	Movement between scenes, game state, enemy spawning and reproduction, saving and loading
Creature Evolution	Gene, chromosome, genome, and creature modeling
Player Control	Camera angle and player interaction with virtual environment
Enemy	Movement, swarming behavior, vitality strength, genetic model
Interface	User interface appearance and scenes



Main Menu

1. Simple Design

- textual menu, interface for selecting loadout, etc
 - Pro: Less time-intensive to implement
 - Con: Less user-friendly and innovative

2. Complicated Design

- physical armory where you select weapons and perform some action to start game
 - Pro: Interesting and taking advantage of the unique aspects of VR
 - Con: More complicated and time-intensive, with more moving pieces

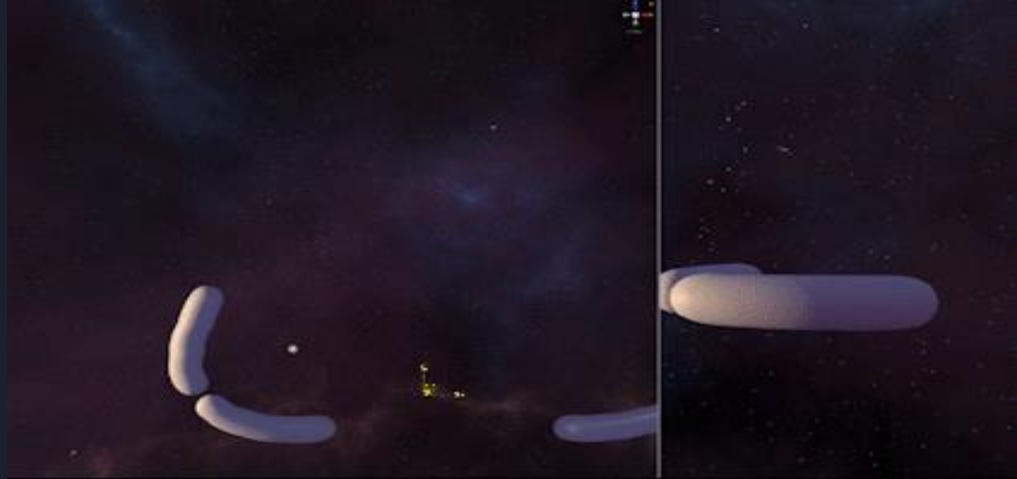
Player Interaction

1. **Stands with back to “wall”**
2. **Has weapons with different capabilities**
 - Fire rate, AOE, firing pattern
 - Should always be fast paced?
 - Shields?
3. **Defends target**
 - Goal condition
 - Health metric - damaged by creature projectiles and collision with creatures



Creatures

1. **Large population**
2. **Short life cycle**
 - Spawn -> killed -> reproduction
3. **Evolvable model with different traits**
 - Segmented
 - Speed, damage, movement
4. **Physics-based movement**
 - Stretch goal: clustering



Project Constraints





Project Deliverables

Client Interview Questions
Budget

Due 09/10

Client Interview

Due 09/17

Product Requirements

Project Schedule

Due 10/01

Snapshot day 1

Due 10/09

Design Validation Plan

Project Value Proposition

Draft Wikipage

Due 10/29

Concept Design Review

Snapshot Day 2

Due 11/26

Design Expo Registration

Due 01/21

Detailed Design Review

Due 01/28

Due 09/03

Prototype population manager

Due 11/05

Prototype weapons

Due 12/10

Prototype goal

Due 09/24

Due 12/24

Enemy movement

Due 12/24

Add creature traits

Due 12/24

Due 10/15

Add fitness

Due 10/22

Due 02/04

Add evolution to creature traits

Due 02/04

Due 11/12

Weapons

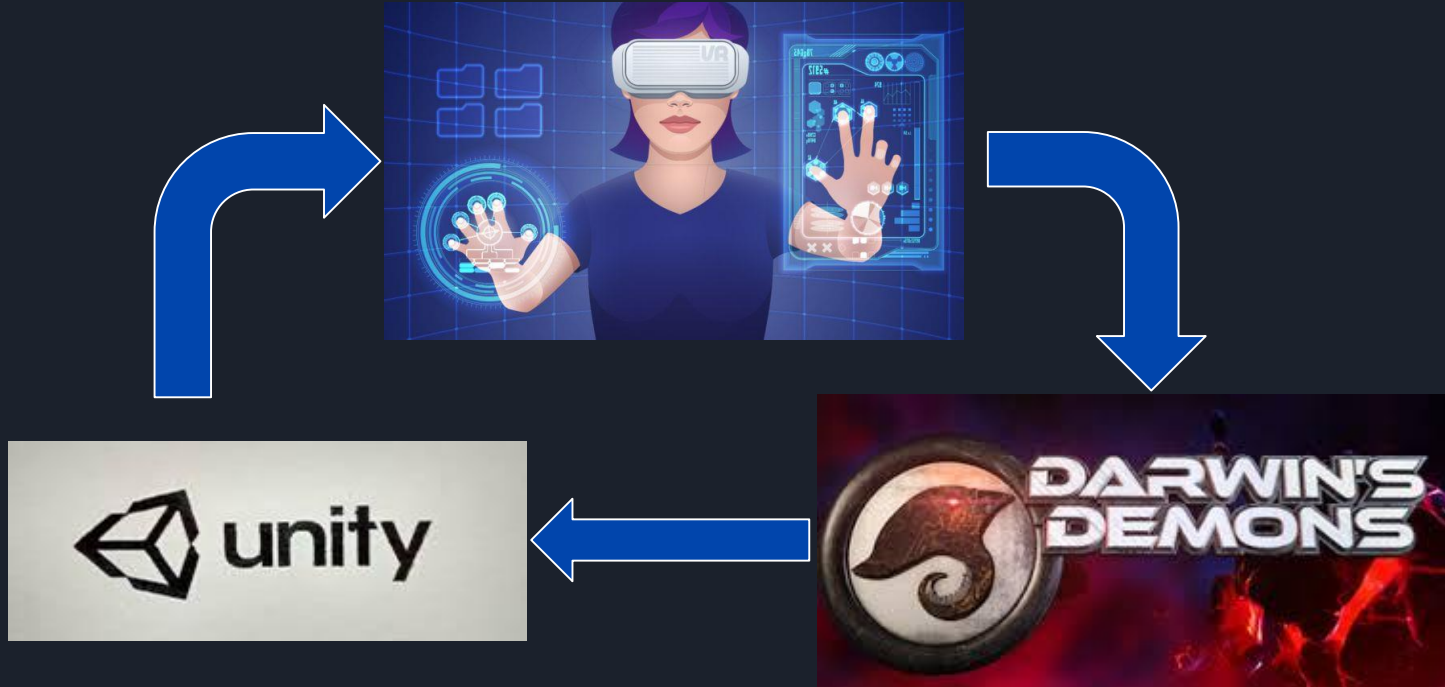
Due 03/11

Implement creature model

Due 12/24

HUD

Project Learning Results





Total Cost Estimate

Polymorphic Games has all of the necessary equipment already available in the studio, including computers and the virtual reality hardware. As such, there is no need to purchase anything new and there is no budget.



Potential Problems & Risks

1. Unanswered questions require prototyping to answer

- Prototyping process takes time


2. Evolution is complicated

- Many variables and can take many iterations to properly balance

We will iterate to ensure a viable end product before adding complex functionality and visual details.



Discussion



Design Issues

- What should be the backdrop behind the player? Is it what the player is defending?
- What is the player defending? How can the player stop projectiles?
- Should we include weapons that might give a subpar player experience but drive different evolutionary patterns?
- Should the player have a shield? How should it work?