

Game demo

Information page, videos and download links:

<https://www.tomsdev.com/ue-zombinvasion/>

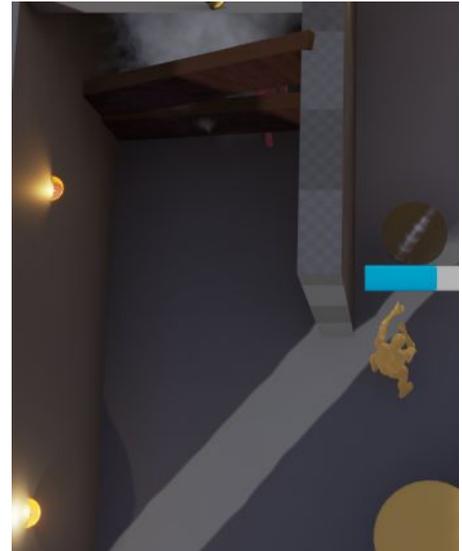
Presentation

Goal: kill as many zombies as you can. Gather boards in order to place defenses and triggers bombs. Take care of not running out of ammo!

Controls:

The game is ought to be played with an xbox360 controller.

- Left stick is used to move the character
- Right stick is used to shoot
- Button A is used to interact with things in the world

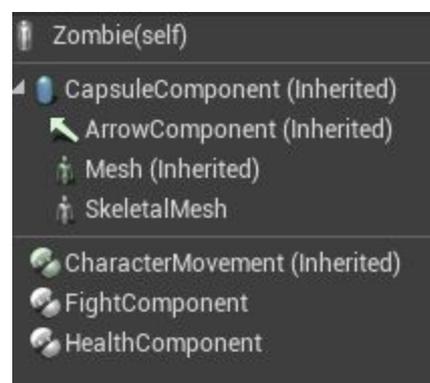
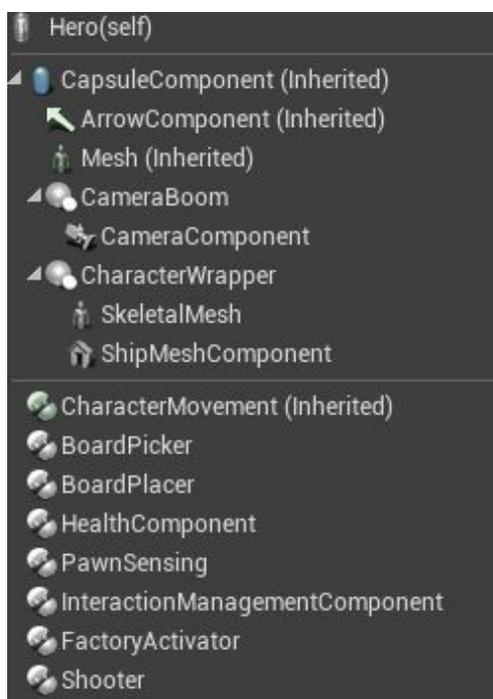


Design

This first game under UE4 was built from the *Twin-stick shooter* template. In the end, most of the template content was either replaced (character control, assets) or refactored/genericized (shooting system). I had two week to build this quick demo, working on my personal time.

Genericity

Creating behaviors/properties as components, in order for them to be reusable.
eg: Hero is mostly made of components. Component wiring and additional effects are performed within the Event Graph, but most of the Hero behavior is driven by components.



Systemic approach

Fight & Health systems

All entities (eg: hero, zombies, board defenses, bombs) are using a common health and damage system, allowing them to interact implicitly.

- Bombs can explode from damages
 - Triggering a bomb from a distance by shooting at it
 - Chaining multiple bombs
- Damage chaining system : let's say the player shoots a bullet to a bomb that then explodes and makes another bomb explode, which kills a zombie. The score will be correctly routed up to the player. See [the score damage chaining video](#) for an example.
- Enemies may pick-up a medikit

Actor spawner

A generic actor used to spawn other actors at configurable rate

- Extended as zombie spawners generating random health
- Used for pickup spawners
- Used as a child of the board factory blueprint



Ammo and Medikit pick-ups spawners

Interaction system

Another reusable system to simplify world interactions :



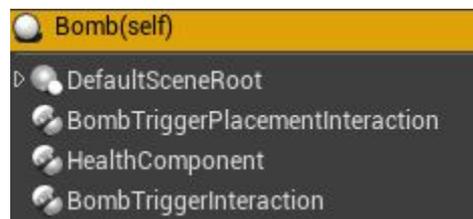
Interactive actors need to have an Interaction component.

Eg: board slots that allow to place defenses:



An actor may also have multiple interactions.

Eg: the bombs require a trigger to be placed on (via BombTriggerPlacementInteraction) before being able to explode (BombTriggerInteraction):



This system is extended by BoardBasedInteraction, to require a board cost to allow activation.

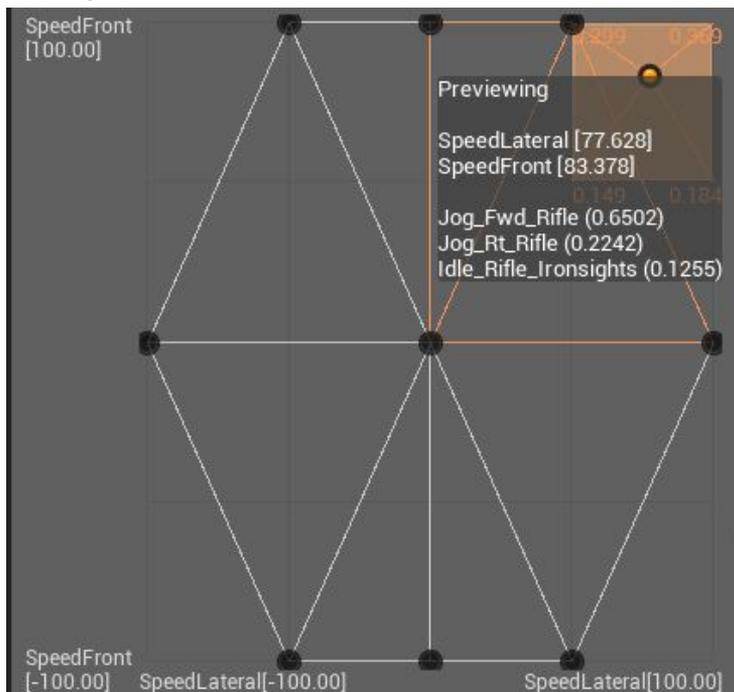


Character Controls

Improved the initial control system from the Twin-stick Shooter template which didn't allow the hero to go up.

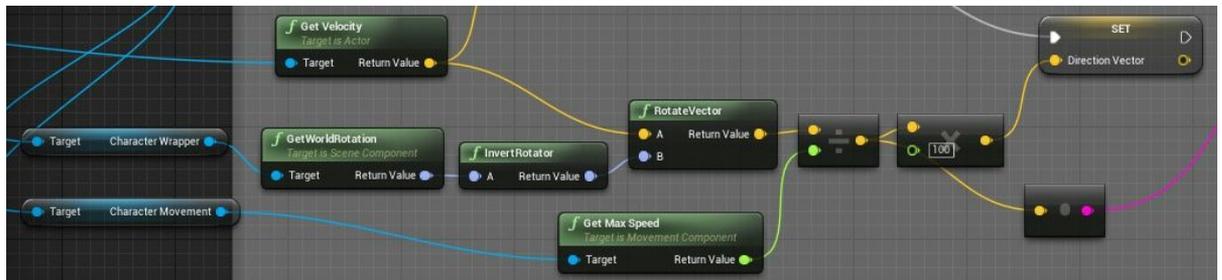
Assets integration

- Character movement: Creating a custom 2D animation blendspace for idle/run with strafing.

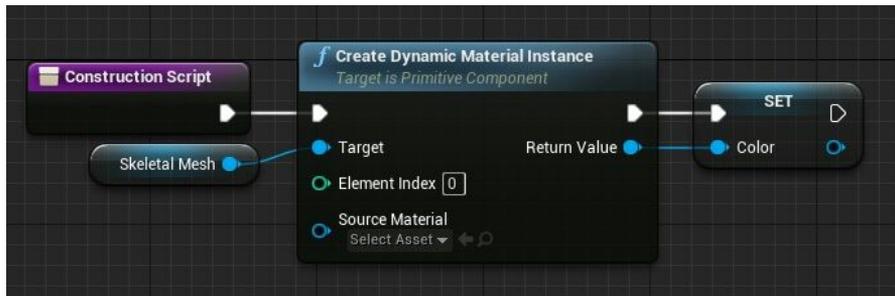


At runtime, the XY coordinates to be used in the blendspace are calculated (as

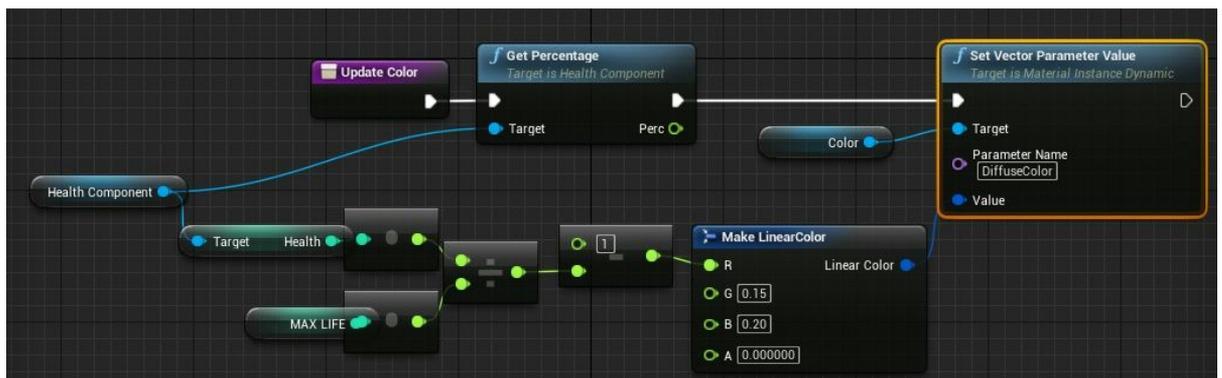
DirectionVector) from the velocity vector and the direction the character is facing:



- Material instances : changing color zombies dynamically to reflect their health state



Updating color upon damages:



Development Agenda

I began my project from the *TwinStick Shooter* template provided by UE, in order to have some foundations to understand how to handle basic things in UE (like character movement or spawning projectiles).

Day 1: discovering UE

Day 2 : barricades game mechanic and health/fight system

Day 3 : Interactions : highlighting closest defense slot

Day 4 : Added UI to display info. Zombies' health is reflected on their color.

Day 5 : board production + progress bar visualization

Day 6,7 : Generic interaction system

Day 8 : Generic board cost system for interactions. Added bombs.

Day 9 : Ammo system and item pickups. Fixed some input issue upon character death

Day 10: Redesigned damage source system in order to support propagation.

Day 11 : Added end-game popup

Day 12 : Added medikit spawn. Added death zone under hole. Integration of a new set of animations. Added animation Blendspace.

Day 13 : Playing with lights. Added death anim. Shooting gameplay videos. Writing this report.