

DOCUMENTATION

VR FPS
SYSTEM



OVERVIEW

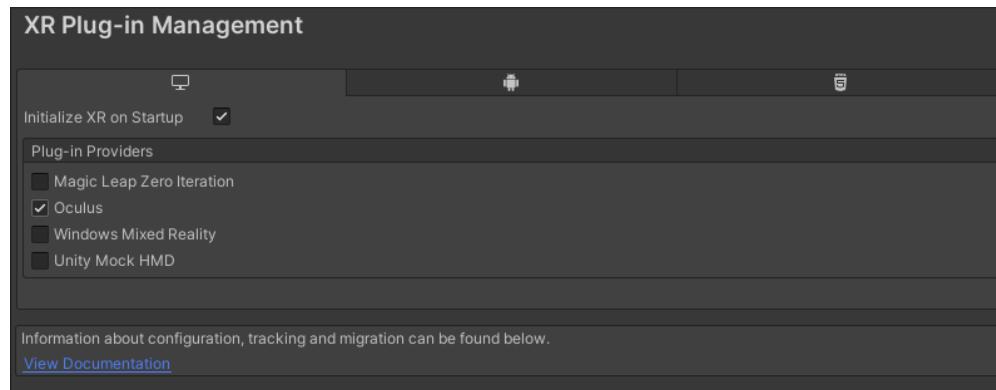
This system allows you to quickly create a player and weapons in the style of games like Pavlov or Onward for the VR game you are working on.

In the example scene you play as a SWAT team member on a rooftop in a destroyed city trying to hold off waves of evil AI android zombies.



SETUP

1. Import the package from the Unity package manager
 - a. If you get a popup asking you to upgrade/install dependencies, then click upgrade/install
2. Go to File → Project Settings → XR Plugin Management
 - a. Install XR Plugin Management if it isn't already installed
 - b. Check off the box for the headset you are using



- c. If your headset type isn't listed
 - i. Go to Window → Package Manager
 - ii. Drop down the "Packages:" dropdown and choose Unity Registry
 - iii. Search "XR"
 - iv. If you see your headset type in the list, click the package and hit "Install"
 - v. Now, go back to the beginning of step 3
3. Open the test scene, at the path "VR FPS Kit/Scenes/Rooftop"
4. Make sure your headset is powered on, both controllers are powered on, and it's connected to your computer
 - a. Linked with Oculus Link or Air Link if using Quest
 - b. SteamVR running if using a SteamVR headset
5. **Click the Play button, and it should work!**
 - a. If it doesn't, see *Troubleshooting* below

TROUBLESHOOTING

NOTE: If you want a refund for any reason, email me stopsecretsam@gmail.com

General troubleshooting

1. If you are using an Oculus, make sure your device is set up for developer mode, see <https://developer.oculus.com/documentation/unity/unity-enable-device/>
2. Make sure your device is powered on and connected to the computer, and that both controllers are powered on

Hands aren't moving in VR

Make sure controllers are on before you hit play on the scene - if controllers turn on afterwards it will not recognize them

Framerate is low

1. Sometimes having an object selected in the inspector causes a slow frame rate in Unity. Not sure why. Make sure nothing is selected in the inspector and try running again.
2. Try changing your graphics settings in Unity down or turn down the resolution scale in SteamVR or Oculus
3. Another known bug in SteamVR is that a while back Valve turned on a feature called "Application Supersampling". Turn this off. More info here:
https://www.reddit.com/r/Vive/comments/8f14rx/super_sampling_with_new_steamvr_settings_advanced/
4. If using Oculus with Air Link, sometimes performance is laggy, switch to a cable for best performance

Console error: ArgumentOutOfRangeException: Index was out of range ...

HandInput.Start () (at Assets/VR FPS Kit/Scripts/Player/HandInput.cs:28)

This is an error where the controllers aren't recognized. This happens when the controllers are powered off when the play button is hit. Power on the controllers before trying to start the scene again

Other errors

I'm on the lookout for bugs if you find them, so just email me at stopsecretsam@gmail.com!

GUN PROPERTIES



The variables for the guns are below, when you attach a Gun.cs script:

Grip

Variable	Purpose
Grip Primary	The primary point on the gun frame to grip, i.e the handle
Grip Secondary	The secondary point on the gun frame to stabilize the gun, a vertical foregrip, etc.
Hand Primary	The hand graphic shown when holding the primary grip
Hand Secondary	The hand graphic shown when holding the secondary grip
Grab Highlight Primary	The highlight shown for the primary grip when hovering over the gun
Grab Highlight Secondary	The highlight shown for the secondary grip when hovering over the gun

Clip

Variable	Purpose
Clip Holster	The holster script that stores the clip for the gun, this is where

	the ammo will be drawn from when firing
Add New Clip Graphic	The highlight graphic shown when the gun runs out of ammo and the clip has to be reloaded

Firing

Variable	Purpose
Fire Rate	The rate (in seconds) between shots
Burst amount	How many bursts from the gun should be fired at one trigger pull <ul style="list-style-type: none"> • 0 - Full auto • 1 - Semi-auto • >1 - rounds fired before you need to press trigger again
Muzzle	Where the bullets should be fired from
Pistol?	Check yes if its a pistol and it will aim based off primary hand rotation, otherwise grabbing with two hands will aim it between primary and secondary
Muzzle flash	The object created at the muzzle when a bullet is fired

Gun Slide

The gun slide will kick back by “slide distance” when it’s fired, and will relax back when the gun runs out of ammo. This will be a slide on a pistol, but will be a bolt on assault rifles, machine guns, etc.

Recoil

The player will have to pull down on their secondary hand to combat recoil, especially on large guns.

Variable	Purpose
Recoil Pivot	The transform to apply recoil to
Virtual Stock?	If this is unchecked, the front and back hands decide the gun’s forward vector. If checked, the player’s head rotation also decides the gun’s forward vector
Recoil amount up	Will rotate between 0 and this many degrees up each round fired

Recoil amount side	Will rotate between 0 and this many degrees to either side each round fired
Recoil recenter power	<p>How much to pull back to center after knocked off by recoil</p> <ul style="list-style-type: none"> • 50 - instantaneous back to center • 20 - quickly recenters • 8 - slowly recenters (good for SMGs/LMGs) • 1 - recenters very slowly

SCRIPTS: PLAYER



Hand.cs

Used to pick up objects. Each hand constantly scans the environment for objects to pick up, and then it sends the appropriate messages. They can also hold and stabilize weapons. Use “grab radius” to specify how far you can pick up objects.

HandInput.cs

This exposes XR inputs for left and right hands through public methods. For example, you can get when the A button is pressed down through GetAButtonDown()

Health.cs

General health management, used for the player and enemies:

Variable	Type	Purpose
Pistols	True/false	Can this holster hold pistols?
Guns	True/false	Can this holster hold rifles?
Clips	True/false	Can this holster hold clips?
Grenades	True/false	Can this holster hold grenades? (<i>Not implemented</i>)
Other	True/false	Can this holster hold pistols?

Specific Name	Text	Holster can hold objects that start with this specific name
Held	Object	The currently holstered object
Holster Sound	Audio	The sound that will be made when something gets holstered

Holster.cs

Receives objects to holster and puts them in the right position. Also acts as a filter to stop you from holstering the wrong types of weapons or clips in the wrong places. There are general filters for things like guns and clips, or you can use a text filter for a specific object. This “Holster” is not just used in the vest, it is also used in the gun to store the clip.

PainEffect.cs

When damaged, a red effect flashes on the screen. When the player’s health is low, pulses like a heartbeat. This does the heavy lifting for Health.cs and the two are closely related.

PlayerMotor.cs

A comprehensive character motor- variables are self-explanatory. You can use this to control general info like speed, acceleration, jump height.

PlayerMovementInput.cs

Specifies the movement that drives PlayerMotor.cs, also controls when to play footstep sounds.

Restart.cs

Restarts the current scene when the trigger is pulled on the VR gamepad.

Vest.cs

This makes the vest follow the main camera. It has a variable for neck length so that when you look down the vest will move backwards, since a person looking down will not look directly down like a camera in 3d space.

SCRIPTS: WEAPONS

Bullet.cs

Specifies a point ray that casts and flies until it hits something

Variable	Type	Purpose
Speed	Number (meters)	How many meters/s the bullet should travel
Gravity	Number (meters)	How much gravity should be applied in meters/s
Deviance	Number (angle)	How much of a random angle the bullet should leave the chamber at (used to make guns more inaccurate)
Damage	Number	The damage in hit points that a bullet should do
Hit Graphic	Object	The object to spawn when a non-enemy surface is hit
Hit Graphic Enemy	Object	The object to spawn when we hit an enemy

Clip.cs

Holds a certain number of bullets. The gun “takes” bullets from the clip to fire.

Important: specify the bullets in the clip object, not the gun object.

Grabable.cs

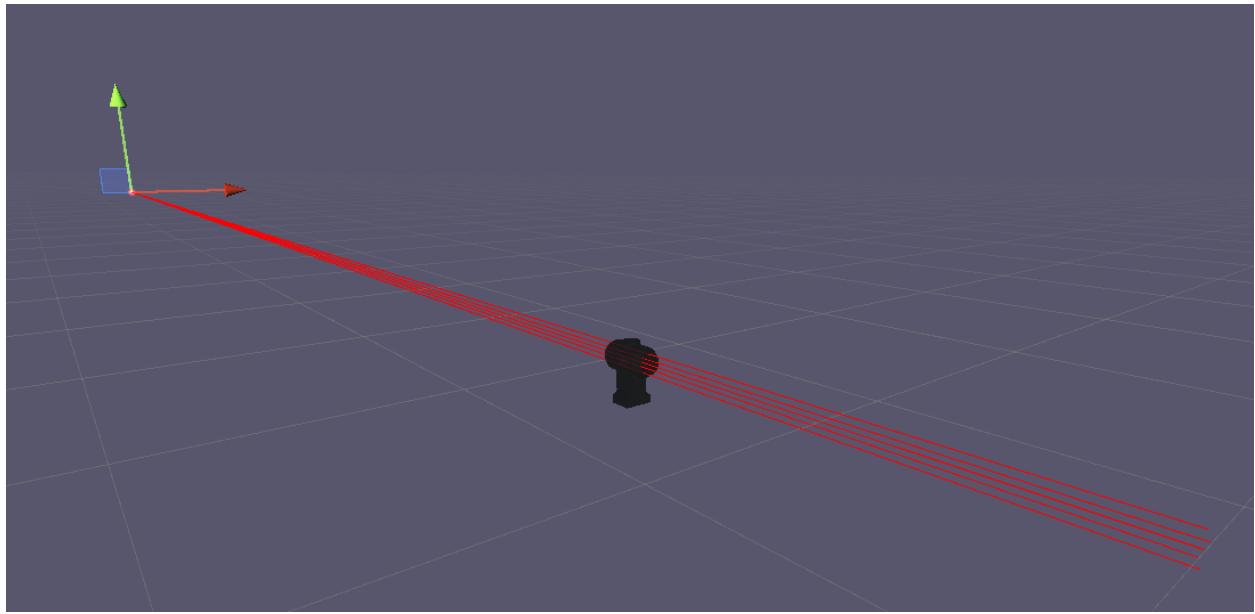
Used to grab Clip objects and display a hand holding them

Gun.cs

See “Gun Properties” above

RedDotSight.cs

This is a rather complicated setup. It is best understood by opening the “Gun_Sight_RedDot” prefab. Go to the “Dot” object.



Angle specifies the angle of visibility, and distance are shown in red above. This looks at the left and right XR cameras “LeftEye_Holo_Sight” and “RightEye_Holo_Sight” on the player object, and if either falls into view of this red cone, it enables the corresponding sight object

SCRIPTS: ENEMIES

SpawnPoint.cs

Spawns enemies at randomly.

Variable	Type	Purpose
Enemies	List of objects	List of enemies to spawn (script wil choose randomly)
Spawn Radius	Number	Radius that enemies will spawn
Initial Delay	Time in seconds	Time before enemies start spawning
Spawn Frequency	Time in seconds	Maximum time between spawns. Ex. if set to 5, each enemy will spawn between 2.5s and 5s apart

Zombie.cs

Move and animate the zombie. Attack the player when the zombie gets close to them.

SCRIPTS: OTHER

DamageArea.cs

When the player/enemy enters the object's trigger, damage the player/enemy. Used to kill the player if they fall off the building.

EnableOnTrigger.cs

When something enters the object's trigger, enable another object. Used to start the zombies spawning

LightupOnHit.cs

For target practice, when a bullet hits an object, change its material for 3 seconds

TimedObjectDestructor.cs

Destroys an object after a given number of seconds, mostly used to clean up particle systems