FIRST PERSON VIEW

MANUAL

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Introduction

First Person View is an asset that allows you to have a First Person Perspective where first person objects do not clip through the environment, have a separate field of view from the environment and can receive shadows from the environment.
In this document i'll describe how this method works and how to make it work in your project.

Every script is well documented and well structured for you to be able to understand how everything works and be able to modify and improve it for your specific needs.

This asset was made for free for everyone to support the Unity Community.

Features

Game Features

- First Person View models don’t clip through the environment
- First Person View models receive shadows from the environment
- Independent Field-of-View between First Person View and the World View
- Ability to choose objects that will or not cast shadows on the First Person View models

Script Features

- Ability to automatically change between World View + First Person View and World View only. (useful when the player interacts with the environment)
- Ability to assign and remove objects to/from the First Person View perspective
- Automatic Layer assignment for First Person Objects. It preserves original layers when changing the objects back to World View

Editor Features

- Automatically create the Camera asset with First Person View ready
- Add/remove First Person Object component to/from selected objects

Limitations

As of now, the only limitations of this system are:

- No support for Unity’s Terrain Engine Tree shadows. Normal trees put outside of the terrain system will work good.

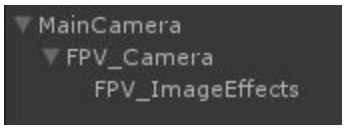
How it Works

Layers

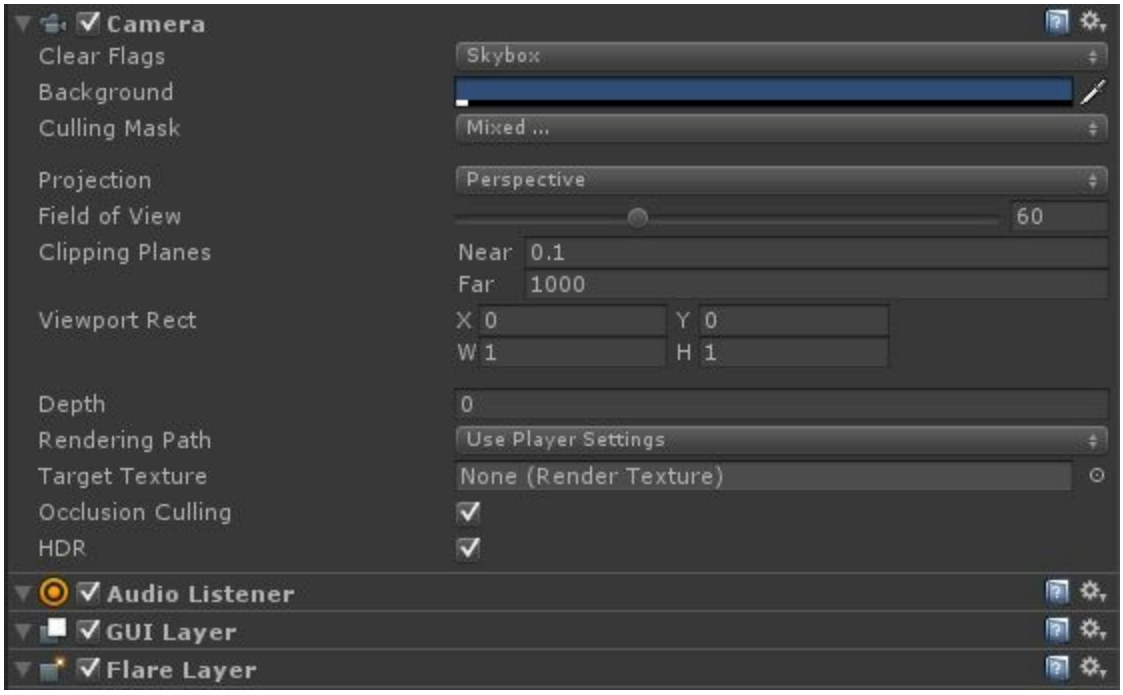
For this setup to work, you need to set a layer named “FirstPersonView”. A script will automatically find its id, so no need to set the layer in any script.

Camera

The Camera object is a 3 camera setup



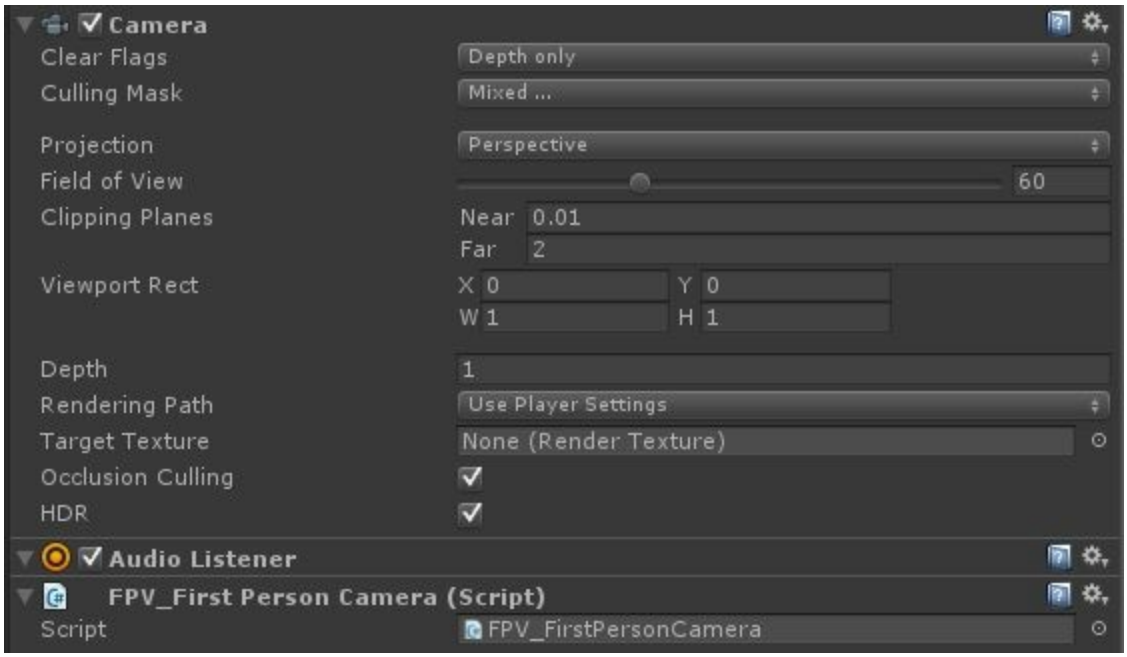
MainCamera



The main camera is the camera that renders the environment.
Set the far and near clipping planes to your specific needs.

All Depth Based Post Processing Effects should be used in this camera. It can also be used in the last camera, but there are limitations due to how the depth buffer is modified.

First Person View Camera

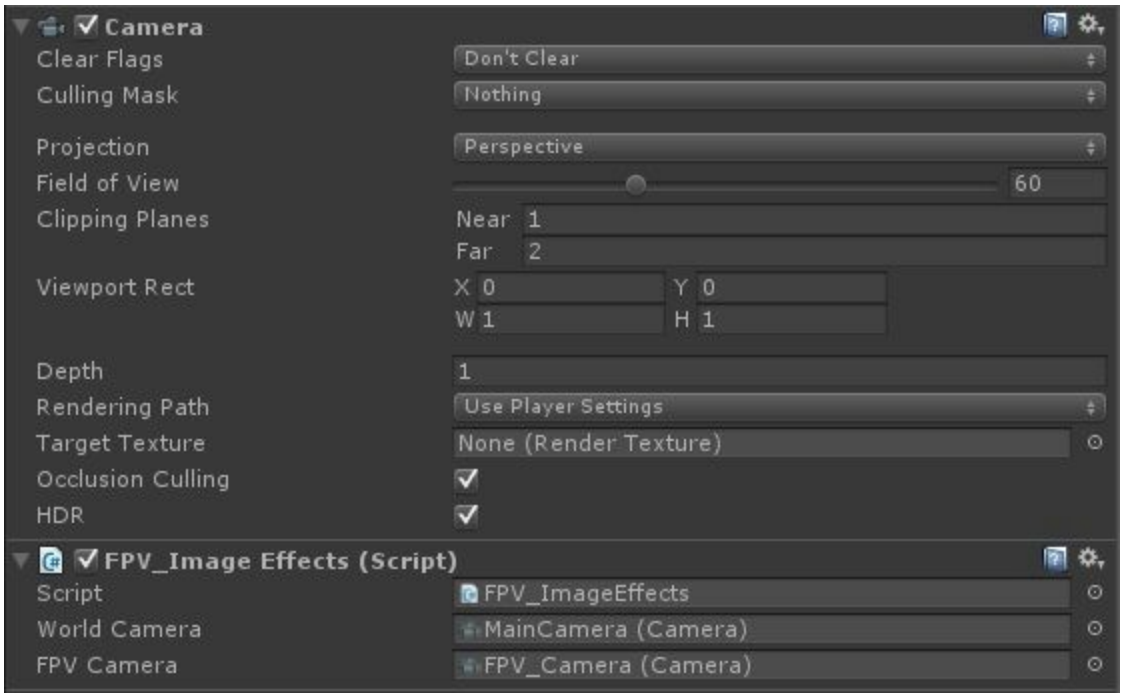


The First Person View Camera will render the first person perspective.

How this camera is setup, the camera will only clear the depth buffer and it will render every layer (except layers you know the player will never be close to, like clouds, far buildings, etc). For this camera, you need to set the Clipping Planes to small values, like [0.01, 2]. You can increase it if really necessary, but don't increase it too much.

The FPV_FirstPersonCamera component is attached to this camera, is what will handle the First Person View.
Simplifying, this component will set all objects that will need to be rendered that are not part of the First Person View to render in ShadowsOnly mode.
After rendering, it will revert every object back to their original state.

Image Effects Camera



The Image Effects Camera is set in a way that will not render anything.

The FPV_ImageEffects component will use the WorldCamera and the FPV_Camera and make them render into a custom RenderTexture that will then be used by this camera.
Due to how Unity works, this makes it possible to use the depth buffer from all cameras in a simple way.

All effects that are not Depth Based should be used after this component.
Some Depth Based Image Effects will work here, but some are better used in the WorldCamera.

First Person Object and First Person View

First Person Objects are objects that will have a special component attached to them that will allow the system to enable shadowsOnly/Disable/Enable with ease.

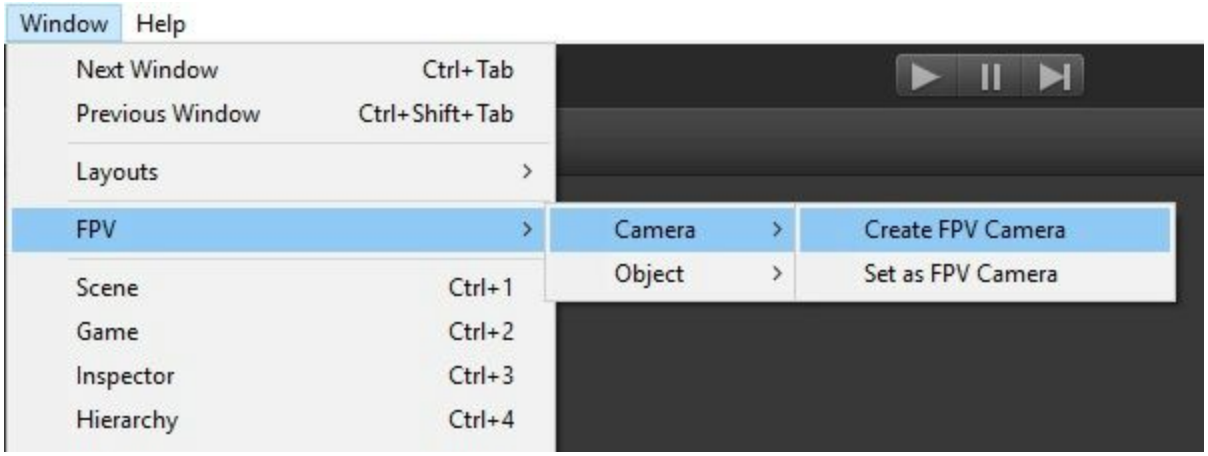
When the FPV_Object component is attached to a gameobject, it will automatically create FPV_Renderer components for all objects inside it that have a renderer component.
Each time the renderer is going to get rendered by the FPV_Camera, the FPV_Renderer will tell the FPV_Object that it needs to render objects inside it. This is used to reduce the amount of searching steps the algorithm needs to do to enable/disable objects. (this might be improved later on).

This algorithm scales very well with scene complexity, since it won't care about objects that the FPV_Camera doesn't see.

For better performance, you should use FPV_Object component for hierarchy type objects where there are not that many renderers inside it.

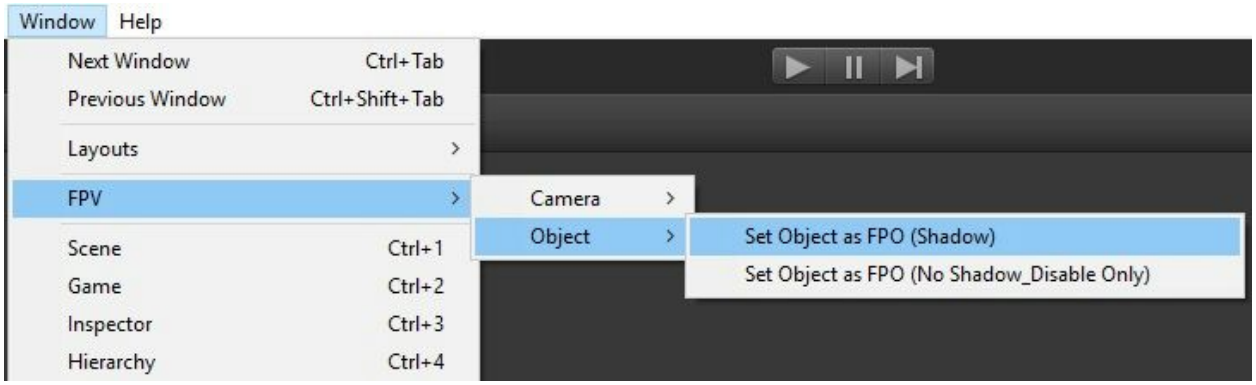
Setup

To setup this system, first create a new Camera Object through Window/FPV/Camera/Create FPV Camera



This will automatically create all cameras and setup every component and their properties. After this, your camera is ready to be used.

Next, for every object you have at the top of its hierarchy, add the FPV_Object component to it through Window/FPV/Object/



Select the option you want for all the renderers inside your object.

And you are all set.

Scripting Functionalities

FPV_Container.cs

- public static void AddGenericFPO(GameObject obj)

Automatically add a standard GameObject to this system and it will add all needed components

- public static void AddDisableOnlyFPO(GameObject obj)

Automatically add a DisableOnly type GameObject to this system and it will add all needed components

- **public static void ClearContainers()**

Necessary to clear all data when switching between scenes.

IFPV_Object.cs

- public void SetAsFirstPersonObject()

Call this method when you want an object that has this component to be transformed into a First Person View object. It will automatically handle all renderers inside it (except for other IFPV_Objects inside it. Those you also need to do it manually)

- public void RemoveAsFirstPersonObject()

Call this method when you want an object that has this component to be transformed into a World View object. It will automatically handle all renderers inside it (ecept for other IFPV_Objects inside it. Those you also need to do it manually)

- public bool IsFirstPersonObject()

Checks if this IFPV_Object is a First Person View object.

DEMO

An example scene is included in the project that will simply show how everything is working together.

I used the First Person Controller by Unity. I put it in another package in case you don't want to import it into your project.

Controls:

- normal fps controls for movement
- 'P' will spawn a 'weapon'
- 'i' will attach/detach the weapon from the player. This is used to demonstrate how you can translate objects from world to first person and vice-versa with ease.
- ',' and '.' will increase/decrease the World's Field of View
- 'n' and 'm' will increase/decrease the First Person View Field of View