## Proteus VR template

Video at https://www.youtube.com/watch?v=ml2xgiQ41BY

## Features

- A heavily-modified version of Epic's VR Template plus:

    o 3 fully animated controllers meshes: Hands, Oculus Touch controllers and HTC Vive controllers
        ▪ Can be controlled with Oculus Touch or HTC Vive controllers, and support for Oculus remote
        ▪ Full input mapping
    o Control over controllers opacity, scale, HTC Vive controllers skins, Avatar color
        ▪ For the hands, the scale is 1:1 with Epic VR template. Reduce scale to approx. 0.75 to come close to real-life
    o Function to spawn poles at the 4 corners of the Oculus Guardian or SteamVR chaperone limits
    o Optimizations for Oculus Rift and HTC Vive HMDs
    o "Ghost Mode" with gamepad
        ▪ By default it is turned on; can be turned off or mapped to another input
    o Monitor in front of character
        ▪ Can be spawned (turned off by default) to print useful infos / debug
    o Avatar head
    o Rumble functions adapted to work with Touch & Vive
    o UI interactions
    o Network and single player mode
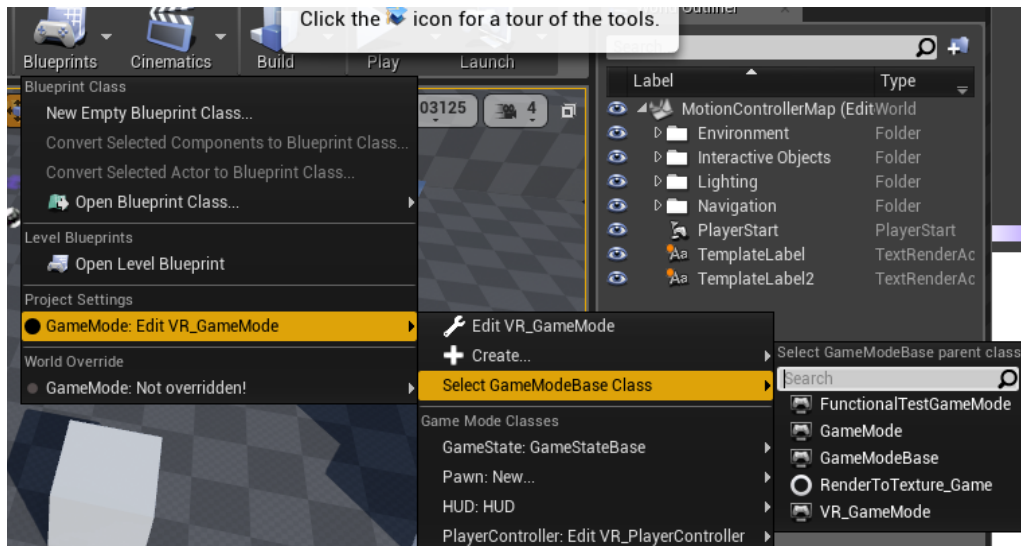        ▪ Works via LAN or Steam (version 2.0 and up)
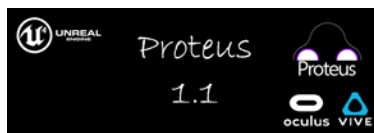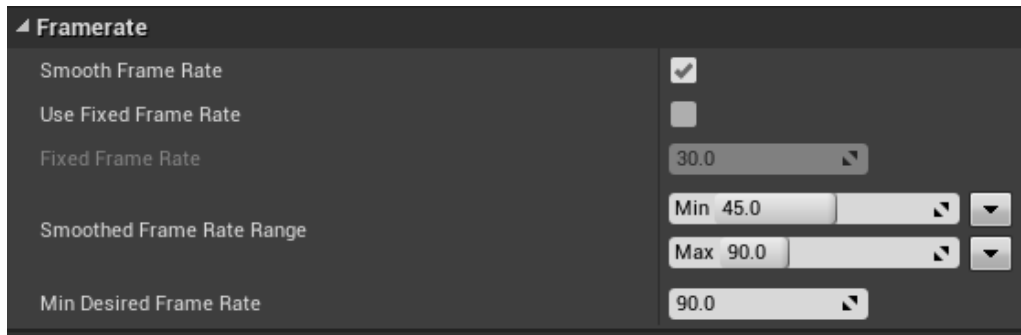
## Version 1.1 (March 13,2017)

## SINGLE PLAYER MODE

## How does it work?

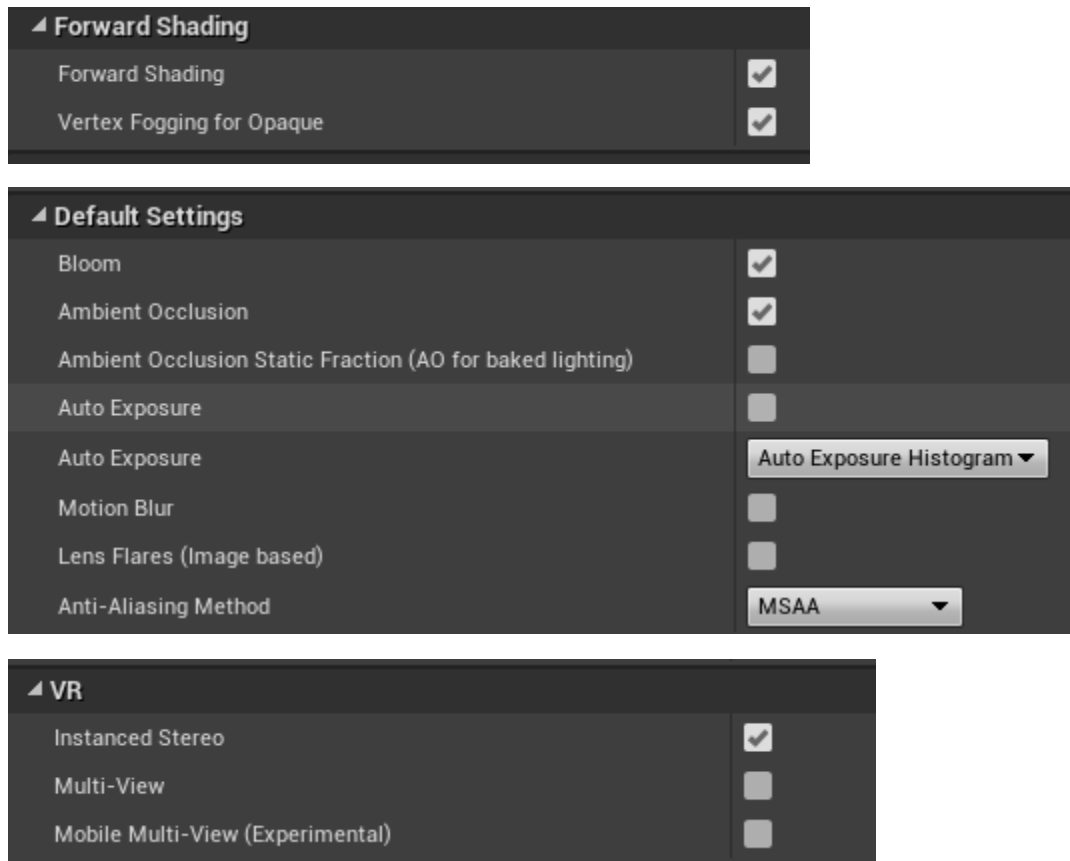Use it directly or import it to another project, by migrating the ProteusSIngle folder into the project

1. Set VR_GameMode as desired gamemode

2. In settings/General Settings/Framerate

⊿ **Framerate**

| | |
|---|---|
| Smooth Frame Rate | ✔ |
| Use Fixed Frame Rate | ☐ |
| Fixed Frame Rate | 30.0 |
| Smoothed Frame Rate Range | Min 45.0 ▾ |
| | Max 90.0 ▾ |
| Min Desired Frame Rate | 90.0 |

3. In settings/Rendering

⊿ **Forward Shading**

| | |
|---|---|
| Forward Shading | ✔ |
| Vertex Fogging for Opaque | ✔ |

⊿ **Default Settings**

| | |
|---|---|
| Bloom | ✔ |
| Ambient Occlusion | ✔ |
| Ambient Occlusion Static Fraction (AO for baked lighting) | ☐ |
| Auto Exposure | ☐ |
| Auto Exposure | Auto Exposure Histogram ▾ |
| Motion Blur | ☐ |
| Lens Flares (Image based) | ☐ |
| Anti-Aliasing Method | MSAA ▾ |

⊿ **VR**

| | |
|---|---|
| Instanced Stereo | ✔ |
| Multi-View | ☐ |
| Mobile Multi-View (Experimental) | ☐ |

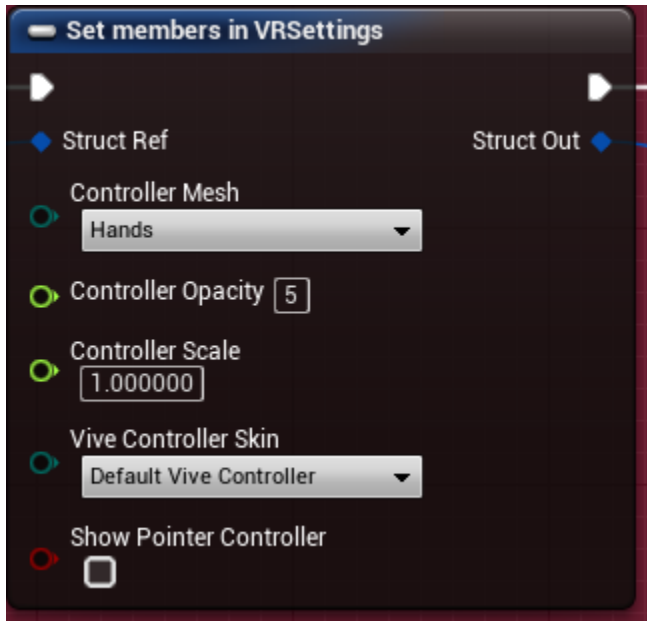4. Avoid using auto exposure, motion blur, lens flares and screen space reflections

5. Set desired settings in VR_PlayerController
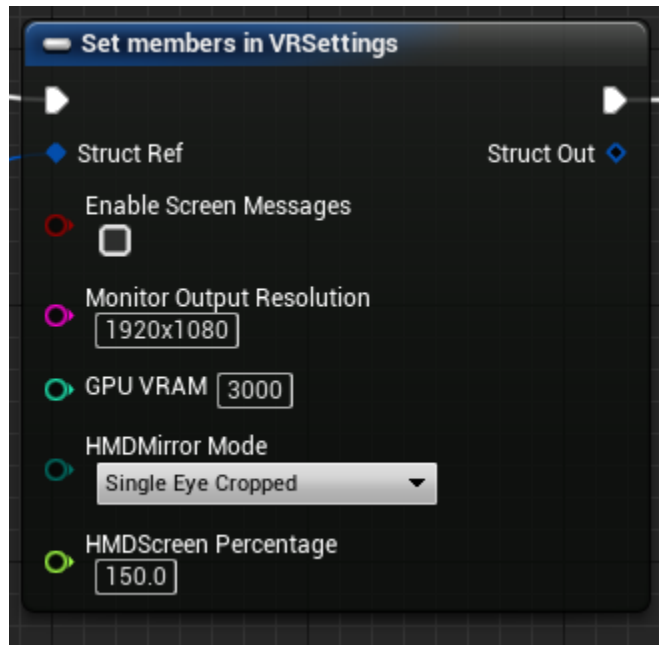


6. Set desired settings in MotionControllerPawn

7. Set desired settings in BP_MotionController



8. Pawn will spawn at playerstart (placed on the floor) and will teleport on navmesh

## So, what this is about?

This template consists of HTC Vive and Oculus Rift compatible pawn and settings, ready to drop in your game. So what you can do is choose the features you want, and build yourself/modify a pawn based on the functionalities you need.

## Source material

- Epic VR template
- Epic Couch Knights (for avatar head)
- All other meshes, animations and blueprints are from Proteus

## Which HMD works with the template?

The template is optimized for the HTC Vive and Oculus Rift with Vive or Touch controllers w/wo gamepad

## Which Unreal Engine 4 version works with the template?

The template has been developed and tested with Unreal Engine 4.15.0

## Another VR Template? There's already a ton of it.
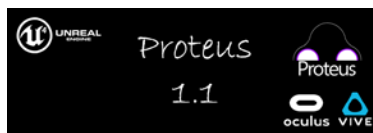
This template is very simple, no plugins, no fuss. It gives a good start to use Touch and Vive controllers, in single or multiplayer mode.

If you want to try different templates, here's three I recommend:

- Steam VR template (works with rift): adds the use of sockets when grabbing, different teleport functions, vehicle, platforms and a freakin' lightsaber. And hey, it's from me!
    - https://forums.unrealengine.com/showthread.php?106609-Steam-VR-Template
- mordentral's OpenVR expansion template: Adds a ton of features, but you'll need the plugin
    - https://forums.unrealengine.com/showthread.php?116782-VR-(OpenVR)-Expansion-Plugin
- Mitchemmc'VR Content Examples: Basic functionalities
    - https://forums.unrealengine.com/showthread.php?111074-VR-Content-Examples&highlight=mitch

## How can I install it?

Files can be found at https://1drv.ms/f/s!Av77IIIxt2OY0XGGW8UDwykohjuT

GitHub version at https://github.com/ProteusVR/ProteusTemplate *(you need to be logged to Github to open the link)*

Main infos found in the forum at https://forums.unrealengine.com/showthread.php?133957-Single-Multiplayer-Touch-amp-Vive-Proteus-blueprint-only-Template

**To install as a template**, just unzip into the appropriate templates directory like C:\Program Files\Unreal Engine[Version]\Templates for launcher version or[ForkLocation]\UE4\Templates for source version. Launch a new project, and you'll find it in the blueprint section.

**To install as a project file**, unzip in your usual projects folder. Then, delete the file /Config/TemplateDefs.ini and you're ready to go.

**IMPORTANT: If you open it like a regular project without deleting the .ini file, you'll get errors messages.**
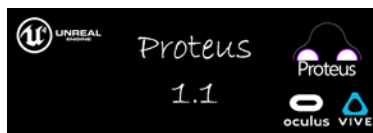
## What is the default input mapping for the Oculus Rift Touch Controllers?

- **Both controllers**
  - o Thumbstick directions: Playground rotation before teleportation
  - o Thumbstick button: Teleport
  - o Index Trigger: Grab / Release
- **Right Controller**
  - o A Button: Teleport
  - o B Button: UI Interaction
- **Left Controller**
  - o X Button: Teleport
  - o Y Button: Guardian poles on/off

## What is the default input mapping for the Vive controllers?

- **Both controllers**
  - o Trackpad directions: Playground rotation before teleportation
  - o Trackpad release: Teleport
  - o Trigger: Grab / Release
- **Right Controller**
  - o Menu Button: UI Interaction
- **Left Controller**
  - o Menu Button: Chaperone poles on/off

## What is the input mapping for the Xbox One gamepad?

- o Primary (left) thumbstick: Move in "ghost" mode
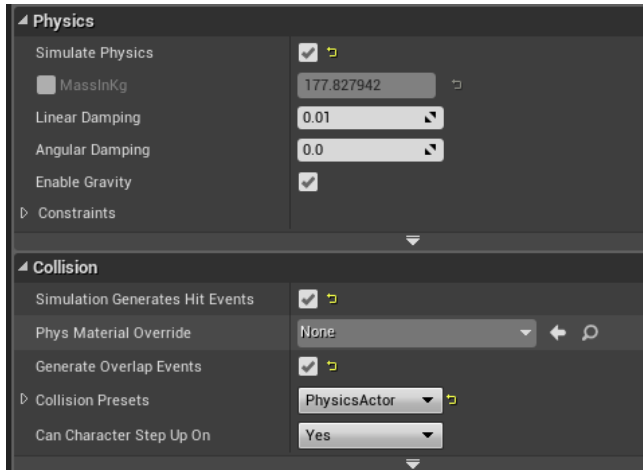- o Secondary (right) thumbstick: Rotate in "ghost" mode

## What is the input mapping for the Oculus Rift remote?

- o By default it is not mapped to anything

## How can I grab objects?
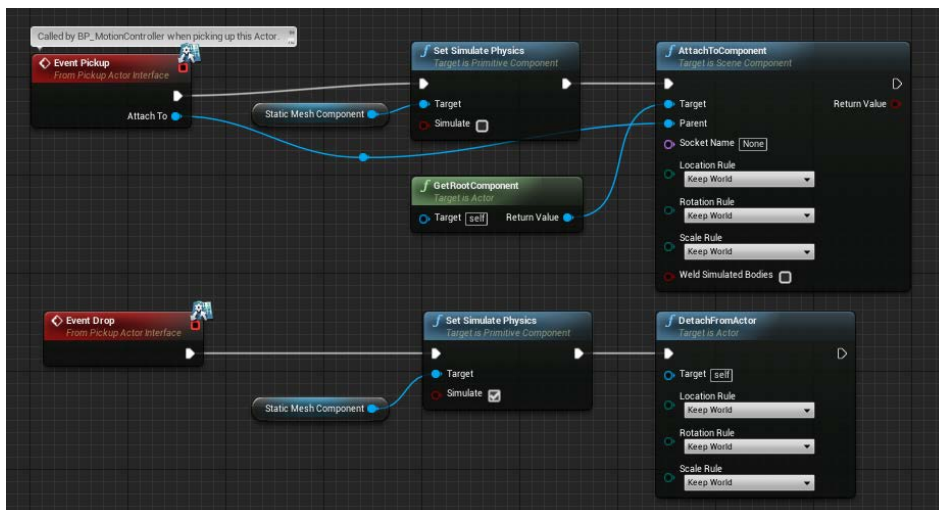
**To enable object to be picked up, you have to:**

- Make a blueprint of the mesh
- Be sure that the mesh inside the blueprint is set at Collision/BlockAllDynamic or PhysicsActor



- Implement Pickup Actor Interface



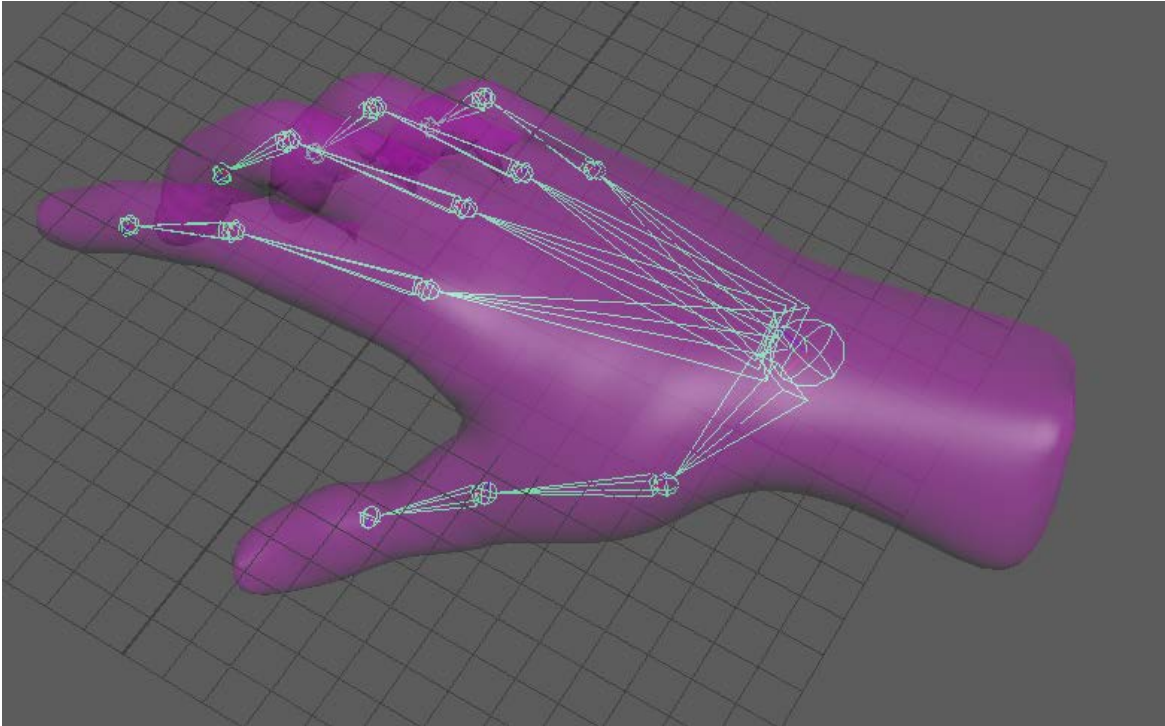- Put Event Pickup and Event Drop functions



- Look at the BP_PickupCube for an example

## How can I add more fingers positions?

The hand model (.fbx) can be found on OneDrive at the same place as the template:

https://1drv.ms/f/s!Av77lIIxt2OY0XGGW8UDwykohjuT



You can then use your favorite 3D software to create fingers poses.

## Can I use more than 2 controllers with the HTC Vive?

You can use a Steam controller with a Steam dongle, or use a Steam Tracker effortlessly for more than 2 tracked objects

## I want to access the camera in the Vive! What can I do?

For now, it works well with the Unreal4AR plugin found at http://www.unreal4ar.com/ (personal license for 99$), but the camera is in low-quality VGA.

## I don't have 45/90 fps! Your template is crap!

The template and the functions inside the pawns are not computer-intensive. It has been rigorously tested and within the main MotionControllerMap, it stays at 90 fps.

99.99% of the time, the problem can be resolved by checking materials, lights and shadows. You have also to carefully assess and tweak the scalability and post-process settings.

**Other settings**
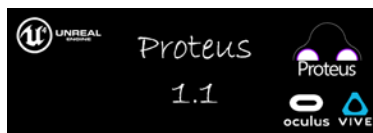
- Try to avoid any other materials than opaque and masked
- Avoid fancy collision boxes
- Eliminate / reduce to minimum dynamic lights and shadows
- Avoid meshes with high poly count
- Reduce the number of animated objects

**I'm still having problems**

For the ones having problem opening/packaging projects:

**Errors on opening are due to:**
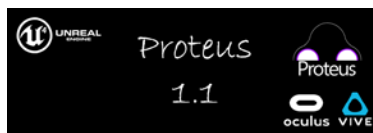
1)Opening the downloaded template as a regular project without deleting the .ini file

2)Using the wrong UE4 version

**99.9% packaging errors are due to**

3)Overlooking settings in Project/Maps & Mode;

4)Overlooking options in Project/Packaging

## What's coming for the future iterations?

- ✓ **Version 3**
    - o Oculus support for Avatar/Rooms

## What are the license terms?

Assets created by Epic can be freely reused in any Unreal Engine 4 project.

Assets created by Proteus are under the MIT license terms.

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