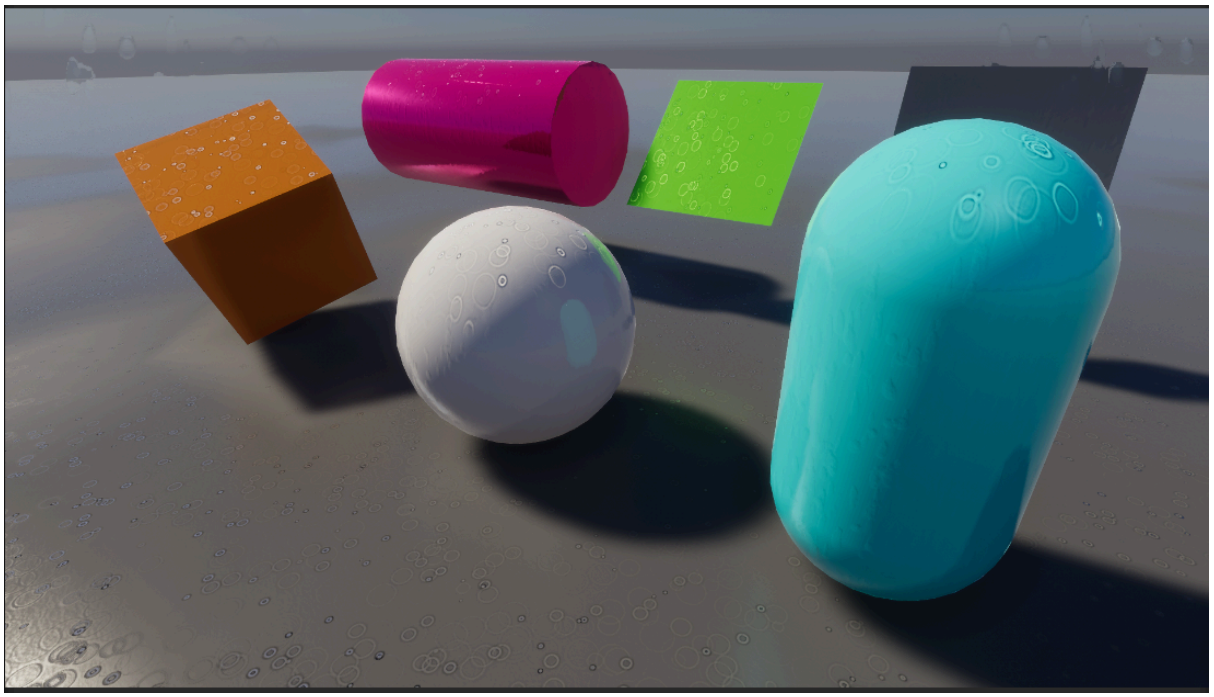
ScreenSpace Rain Wetness

Documentation



Important disclaimer

Unity version : Unity 2023.2+

Demo use raytracing, DX12 as default graphic api

Explanation :

ScreenSpace (fullscreen) RenderPass, why?

I choosed to use ***Screen Space Rendering*** (using Fullscreen Pass) to render few elements like RainDrops and to render directly my effect to the *Normal Buffer* and *Smoothness buffer*, this way I can write the Rain Droplet and Rain Gliding Effect to any Object in the scene, taking in account the original smoothness and normal value of each object.
I choosed this because this is the most optimized and simple to deploy such effect across a project.

RenderPass Tricks inspired from : https://github.com/alelievr/HDRP-Custom-Passes (cf Screen Space Wetness), the smoothness and normal effect from the Rain/Wet can be discarded using various method like textures or vertex painting.

Optimisation : Reading and Writing the NormalBuffer is far more fast than executing the effect on each Shader/Materials in the scene, convenient effect for all environment assets

Artist friendly : Rain/Wet Effect can be mitigated across the scene using VertexColor directly using Polybrush for now, but we can absolutely allow artiste to create special texture to specify where the effect should be apply and where not. And there is various control to offer on such effect.

One click setup : Drag and Drop the **FullScreen Wetness Controller** to wet any scene and add raining effect.

Using ***Shader Graph***, ***Custom Pass***, **VFXgraph** and ***Custom RenderTextures***

The **RainOnCamera** effect

Is just for fun, it is a modified version from the HDRP fullscreen samples :)

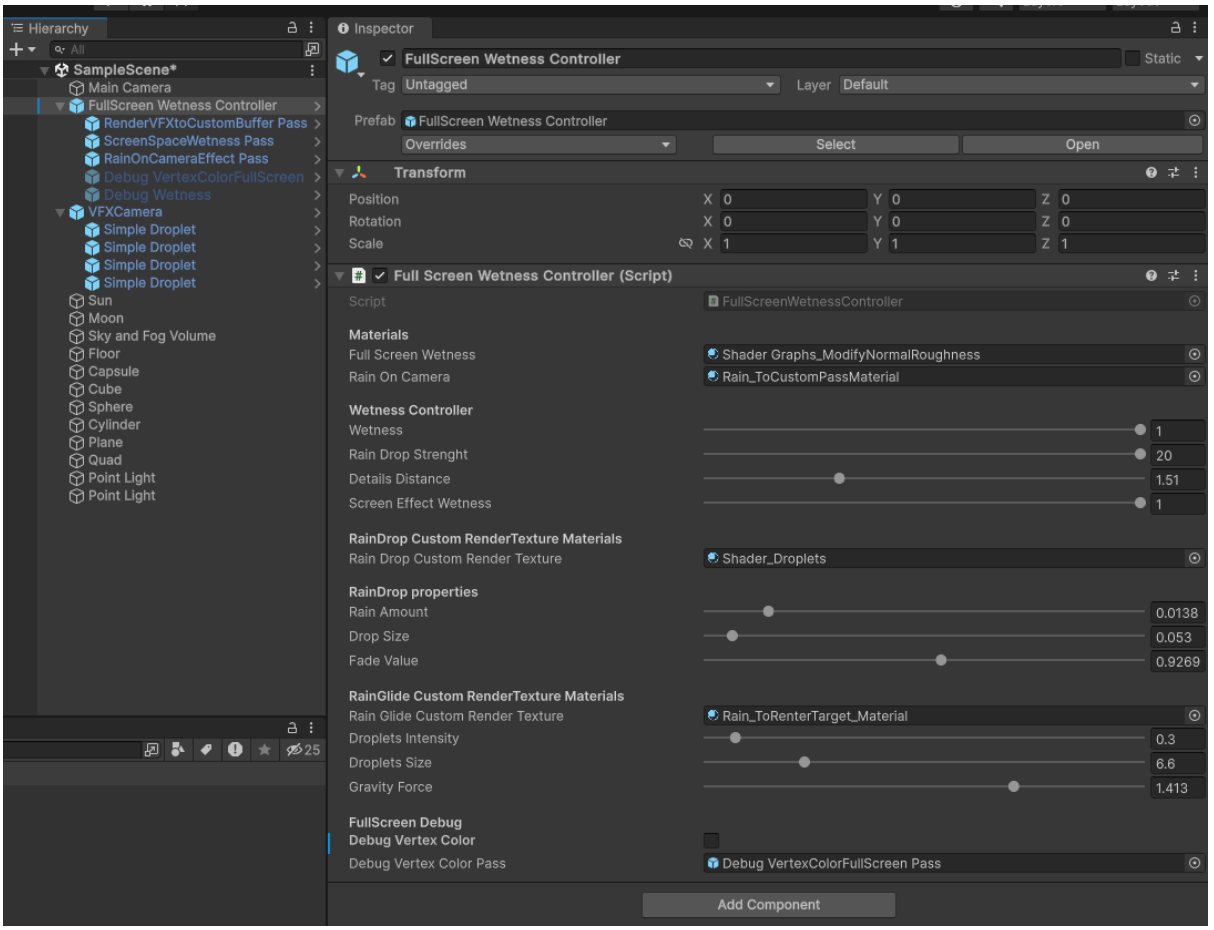
VFXgraph to buffer vs Custom Render Texture

Computing a RenderTexture is faster than Rendering a VFX into a RenderTexture and can demonstrate advantages for many aspects like the effect tilling because noise are mathematically more easily scalable than particles positions.

Using the VFXgraph I choosed to record 4 “flipped” (using rotation) VFXgraph to create some tillable raindrops by default.

Get Started :

Open **SampleScene** in Assets/Scenes
Look at the **FullScreen Wetness Controller** to control over the rain and wet effect



Content :

Enable or disable each effect using the **FullScreen Wetness Controller**

Main components :

- ***FullScreen Wetness Controller***

  GameObject saved as prefab in Assets/FarFromHereStudio/CustomPasses,
  It have the main control we need to apply our Wetness effect.
  It control over the ***ScreenSpaceWetness*** *Pass* and the ***Custom RenderTextures*** Shaders

- ***ScreenSpaceWetness material***

  Material (fullscreen) responsible for the CustomPass which is *encoding* the HDRP ***Smoothness*** And ***Normal Buffer*** to add Wet/Rain effect to all objects.
  Create the ***VertexColor*** pass to draw as ***Custom ColorBuffer***
  Use the ***VertexColor*** pass as mask to hide the Wet/Rain effect and paint across the scene using polybrush, alternatively we could use some textures or additional computing to define this mask over the scene.

- ***Custom RenderTexture : CustomRT_Droplets***

  This Rendertexture is 1024px, RGBA Sfloat32, used as trilinear projected textures by the into the NormalBuffer by the ***ScreenSpaceWetness material*** to create the droplet ring on the top of each object.

- ***RainOnCameraEffect material***

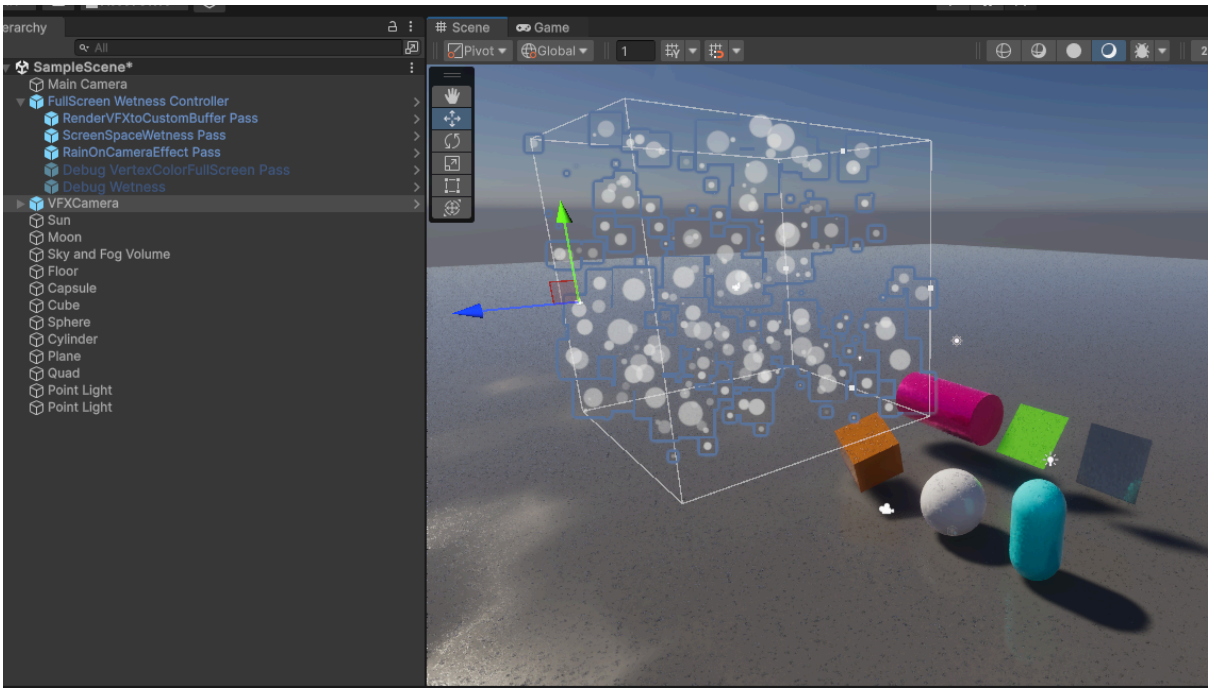
  Material (fullscreen) Add a screen Effect to reinforce wetness feeling

- ***Custom RenderTexture : Rain_RenderTarget***

  This texture is 512px, one channel, used as trilinears projected texture use by the ***ScreenSpaceWetness material*** and the ***RainOnCameraEffect material*** to create the Rain Gliding on each object sides

- ***RenderVFXtoCustomBuffer Pass***

  RenderPass responsible to draw our VFXgraphs into our ***VFXtarget*** (rendertexture), is using the orthographic ***VFXCamera*** (disabled camera) properties to generate the buffer POV and cullings parameters.



this VFX setup is a simple usecase that we can manipulate in scene view (cf the Main Camera culling mask and disabled camera), each VFX are children to the VFXCamera gameObject so it stay aligned to this buffer “bouding box” which is 3x3 meters wide

- ***Debug VertexColorFullScreen Pass***

  Debug the Vertex Color area painted using Polybrush to display where the wet effect is apply

Conclusion :

Hope you like this approach to render out Wetness to a scene through CustomPass and various exposed Buffer, each Shader are complex but offer many ways of modification, it offer a clean workflow overall for environment, but for characters, because this Wetness is worldspace by nature, I would choose to discard this effect and to create an adapted ObjectsSpace equivalent shader feature for skin and clothes.

NB: I don’t darken the color or add ambiante occlusion under the raindrops like the test show, but it should be possible with more time and an additional FullScreen pass.

This is it!