Distortion Shockwave VFX

(aka: ***HYPERSHOCK***)

Intro

A **procedural distortion shader** that tightly integrates with Unity's particle system (aka 'Shuriken') to generate **per-particle** animated distortion/ripple/shockwave effects. It exposes several useful properties to fine-tune its visuals.

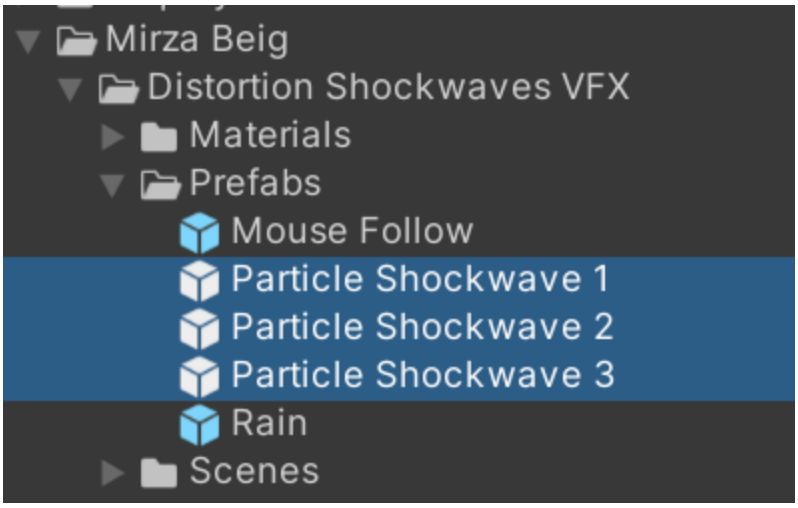
- **Textureless:** The effect is *entirely* procedurally generated and does not suffer from any texture read overhead.
- **Optimized:** Designed with performance in mind, the shader + distortion FX workflow runs efficiently even with complex setups and many CPU particles.
- **Parameterized:** Adjust everything from the intensity and speed of the shockwaves to the minute details of the per-particle distortion with user-defined animation curves.
- **Real-Time:** Tweak parameters in real-time within the Unity editor to see instant changes, enabling rapid iteration and prototyping.
- **Particle-Based:** Direct the shader's behaviour with precision using particles. Achieve unique per-particle variation for dynamic visual effects.

https://prod-files-secure.s3.us-west-2.amazonaws.com/96d96f96-f186-499a-bb02-ee77ffa4d7f1/71fff598-bfd3-4963-8a66-c27625c3bbca/Shockwaves_Demo.mp4

This demo scene is included: **Mirza Beig/Distortion Shockwaves VFX/Scenes/…**

Quickstart (Overview)

The easiest way to use this asset to add distortion ‘shockwaves’ (ripples, pulses, etc…) is to simply use the included prefab(s), tweaking the material and particle system settings to your liking.

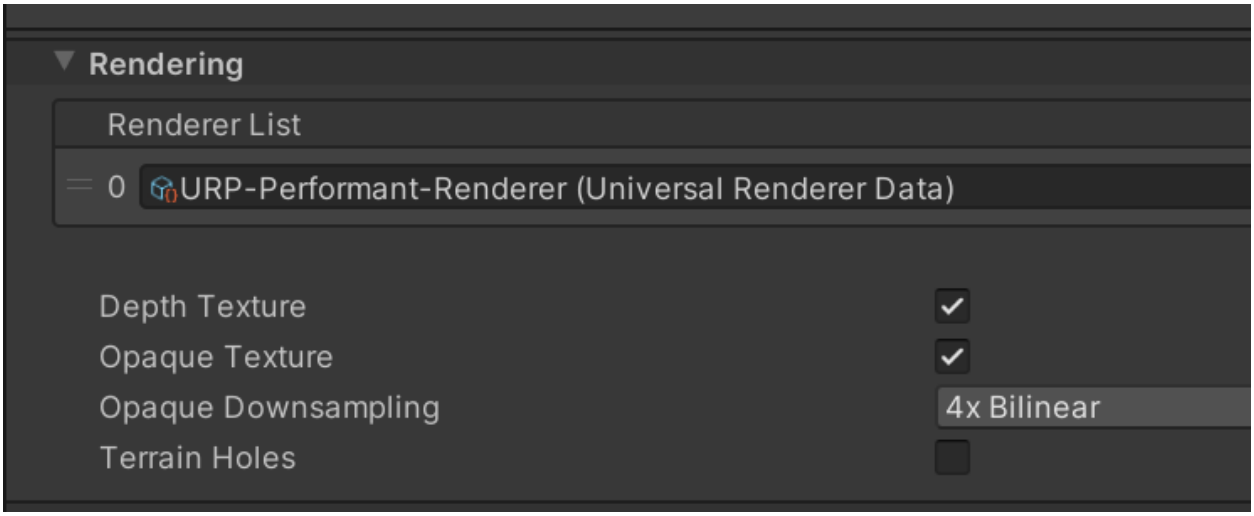


This asset comes with pre-configured particle FX prefabs.

That's really all there is to it :)

At this point it's just a matter of controlling the particle system as usual.

You can preview the debug view of shockwaves by turning up the *Debug* slider on the shader.



If for whatever reason the distortion effects are not working, please make sure you're rendering the Opaque texture in URP's settings. The depth texture will also be required for seamless blending.

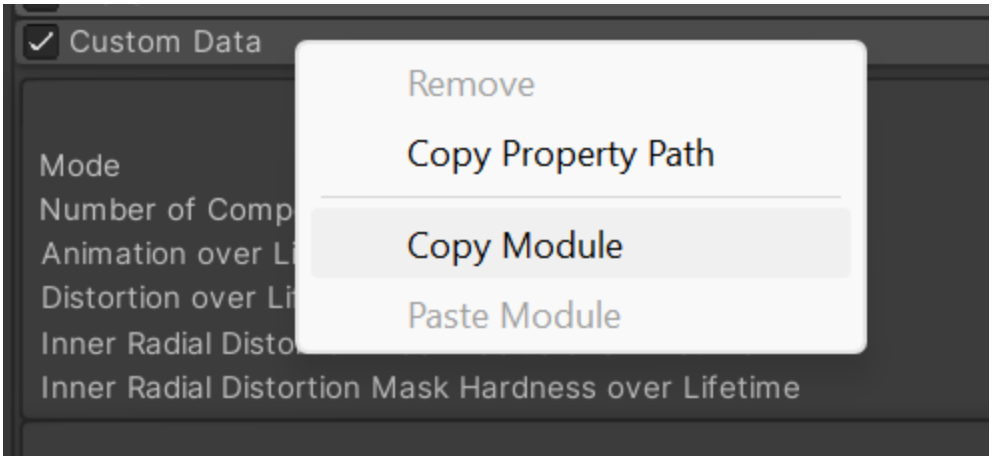
https://prod-files-secure.s3.us-west-2.amazonaws.com/96d96f96-f186-499a-bb02-ee77ffa4d7f1/bf32962a-b0d3-4df1-83b0-b5c0fb660133/Shockwave_Distortion.mp4

Setup

For ***maximum*** control, you can dive into the prefab's particle system setup.

The *Distortion Shockwave Particle* shader can read per-particle data from the system it's assigned to, and render each shockwave accordingly, with randomization between particles if needed.

This is all setup for you if you're just editing the included prefab(s).

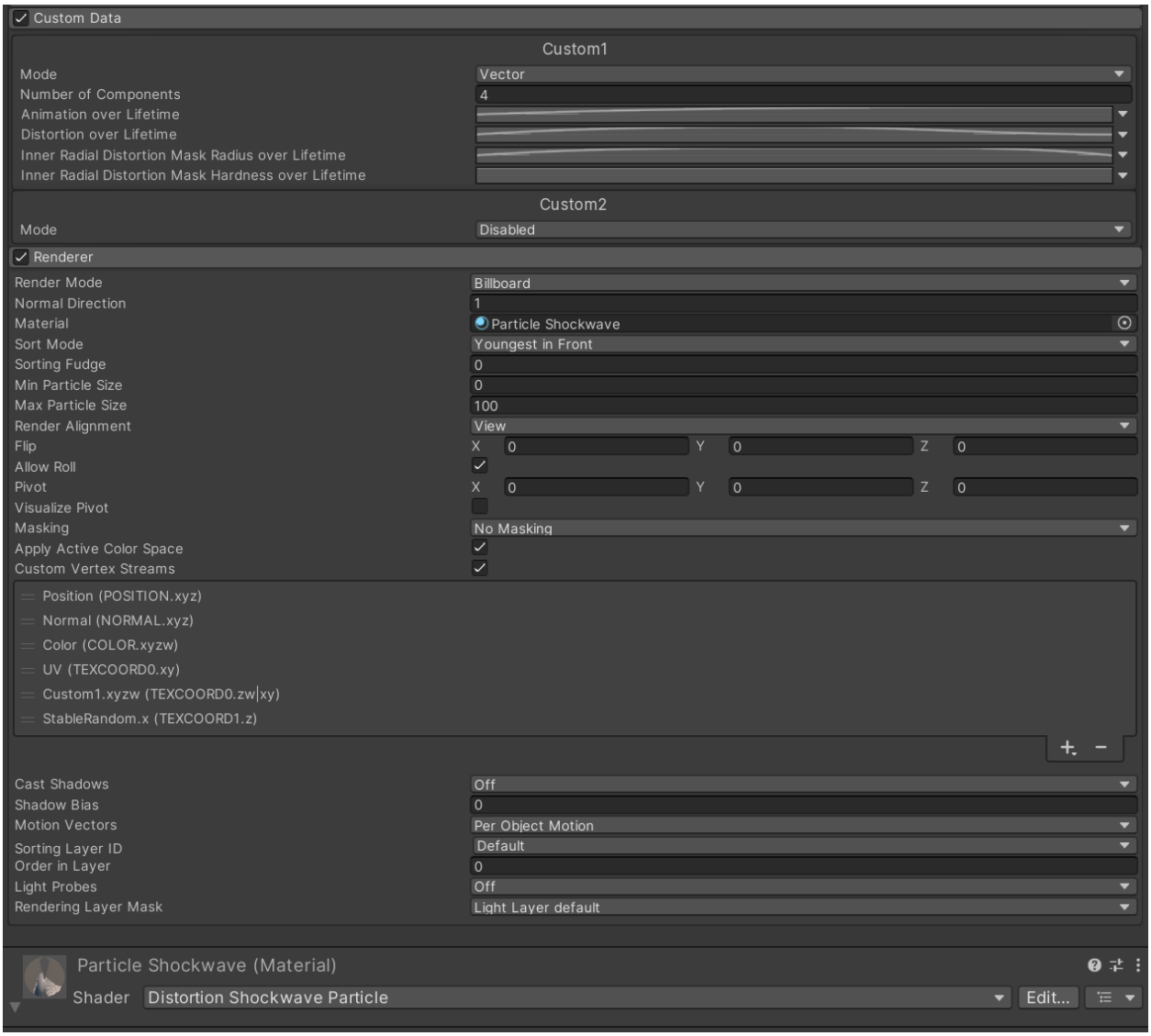


If you ever need to work with a fresh particle system, you can right-click to copy the entire module's settings across systems and retain this setup.

It's strongly recommended you re-use the prefab particle system in some way. Setting a up a fresh particle system, while not difficult, is rather tedious and it's already taken care of for you. Feel free to copy the module settings as it's much easier than manually editing these properties.

The two required modules are **Custom Data** and the **Renderer.**

Renderer needs to have *Custom Vertex Streams* enabled with the correct data and order, as below.



Note: Custom Data uses 4 curve vectors over the lifetime of each particle, they are properly labelled.

Shader Properties

You can fine-tune the shader to suit your needs.

Base

- **Colour:** distortion tint.
- **Tiling:** number of ripples.

- **Animation:** constant animation.
- **Particle Animation: a**mount of animation per-particle, controlled by the *Animation over Lifetime* custom data curve.
- **Particle Randomize:** 0.0 = no randomization, 1.0 = full randomization of animation state.
- **Wave Smoothness:** smoothing between ripples.
- **Wave Smoothstep: a**dditional smoothing calculations (internally applies *smoothstep*, [0.0, 1.0]).

Distortion

- **Distortion:** how much of the screen to displace/distort.
- **Distortion Normal Strength:** maximum distortion strength possible.
- **Distortion Depth Fade:** blend distortion strength by scene depth.
- **Distortion Depth Fade Power:** exponential curve to apply to depth fading.

Inner Radial Distortion Mask

These control the mask of the distortion effect, as a radial gradient from the center → outward.

- **…Radius:** scale.
- …**Hardness:** how much to clamp the edges of the mask.
- **…Power:** mask exponential curving/shaping.

- **…as Alpha:** apply mask as Alpha mask to render pixels within the mask transparent.
- **…as Alpha Power:** mask exponential curving/shaping.

Outer Radial Distortion Mask

Similar to *Inner Radial Distortion Mask*, except it applies from the outside → in.

You can remap and shape its curve to feather or harden the edges of your distortion masks.

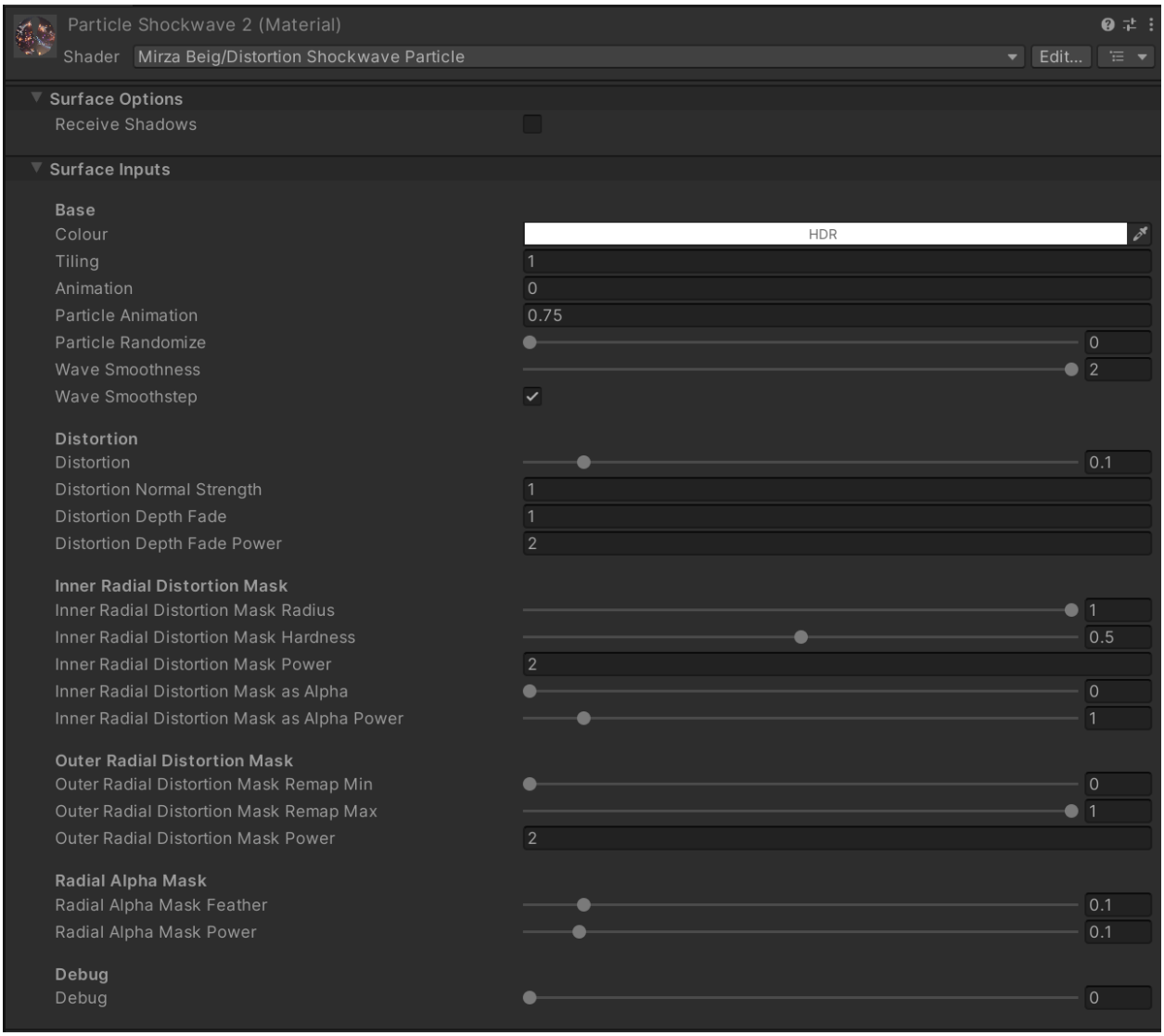
Radial Alpha Mask

Applies a radial gradient mask from the outside → in, to feather/fade away the edges.

- **…Feather:** fade edges.
- **…Power:** mask exponential curving/shaping

Debug

Use this slider to control rendering a mixed view of the distortion, with it’s internally-generated displacement heightmap. Especially useful when you’re shaping and editing the curve manually.


Particle Shockwave 2 (Material)
Shader
Mirza Beig/Distortion Shockwave Particle
Edit...
Surface Options
Receive Shadows
Surface Inputs
Base
Colour
HDR
Tiling
1
Animation
0
Particle Animation
0.75
Particle Randomize
0
Wave Smoothness
2
Wave Smoothstep
Distortion
Distortion
0.1
Distortion Normal Strength
1
Distortion Depth Fade
1
Distortion Depth Fade Power
2
Inner Radial Distortion Mask
Inner Radial Distortion Mask Radius
1
Inner Radial Distortion Mask Hardness
0.5
Inner Radial Distortion Mask Power
2
Inner Radial Distortion Mask as Alpha
0
Inner Radial Distortion Mask as Alpha Power
1
Outer Radial Distortion Mask
Outer Radial Distortion Mask Remap Min
0
Outer Radial Distortion Mask Remap Max
1
Outer Radial Distortion Mask Power
2
Radial Alpha Mask
Radial Alpha Mask Feather
0.1
Radial Alpha Mask Power
0.1
Debug
Debug
0