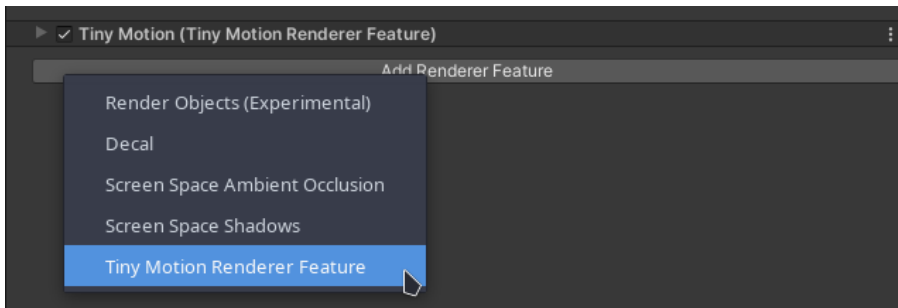## Thank You for purchasing TinyMotion!

I hope you'll enjoy the asset and make good use of it in your project.
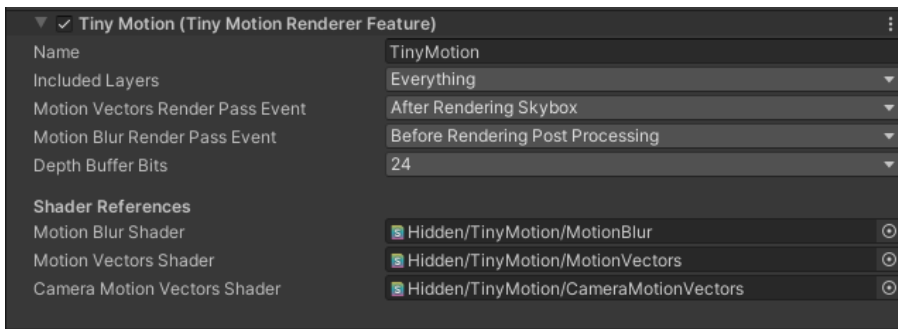
Getting started!

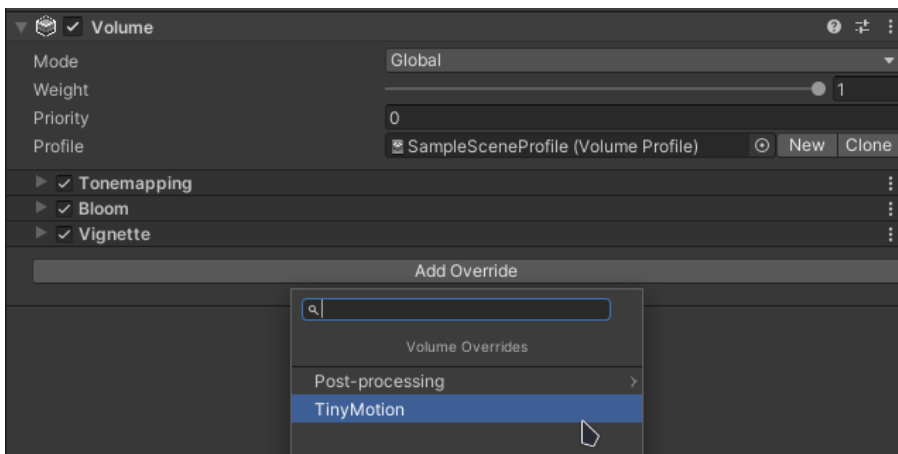**You are just few steps from having motion blur in your scenes:**

1. Add **Tiny Motion Renderer Feature** to your URP-Renderer.

2. Select **Included Layers** that should be included in motion blur and optionally RenderPasses.
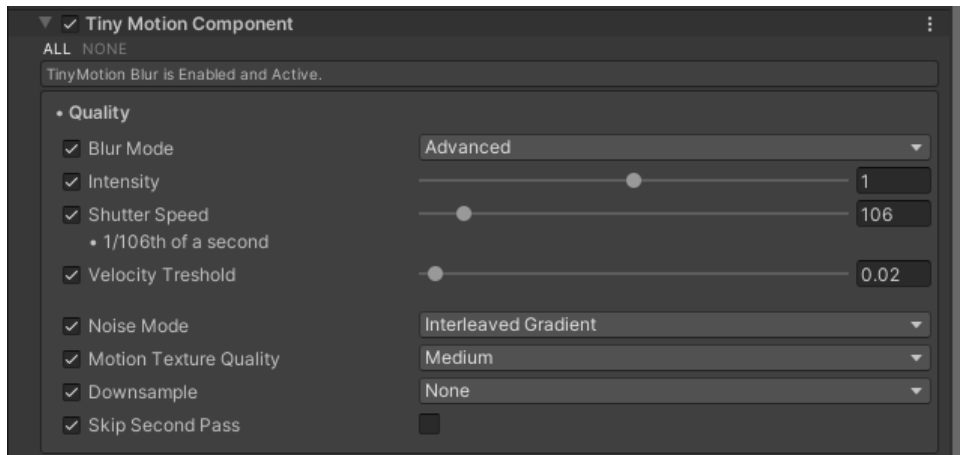

3. Add **TinyMotion Component** to your Volume Profile.

4. **Done! Now you have motion blur in your project, enjoy!**

Basic Options:

- **Blur Mode** – You can use two modes

  - **Simple –** Uses fixed sample count, does not use any of the **Advanced** features – optimal for better performance at the cost of quality.
  - **Advanced** – Configurable/Dynamic Sample Count, lets you configure almost everything.
  - **Advanced with Depth Separation** – Advanced features + Depth Separation based on depth texture and optionally limited by velocity.

- **Intensity** – Controls the overall intensity of the effect. Can be used to fine tune the intensity calculated from *Shutter Speed*.
- **Shutter Speed** – Controls the base intensity, lower values give bigger motion blur, too low values can result in over blurred image, *recommended value is 250*.
- **Velocity Treshold** – Cuts off low velocity movement to prevent blurring of basically static objects.
- **Noise Mode** – Noise is added to the sampling steps to prevent banding. Here you can select from three options:

  - **Interleaved Gradient** – Uses the built in noise function, gives good results but can be repetitive.
  - **Pseudo Random** – Custom noise function without repetition.
  - **None** – Do not add any noise – this can result in banding with high velocity/movement.

- **Motion Texture Quality** – Precision at which the motion blur is stored in texture. Higher is visually better.

  - **High** – RGFloat.
  - **Medium** – RGHalf.
  - **Low** – RG16.
  - For more info please see Unity Documentation.

- **Downsample** – Downsamples the motion velocity texture saving memory and improving performance.
- **Skip Second Pass** – Skips the second pass for improved performance at the cost of quality.

Advanced Options:
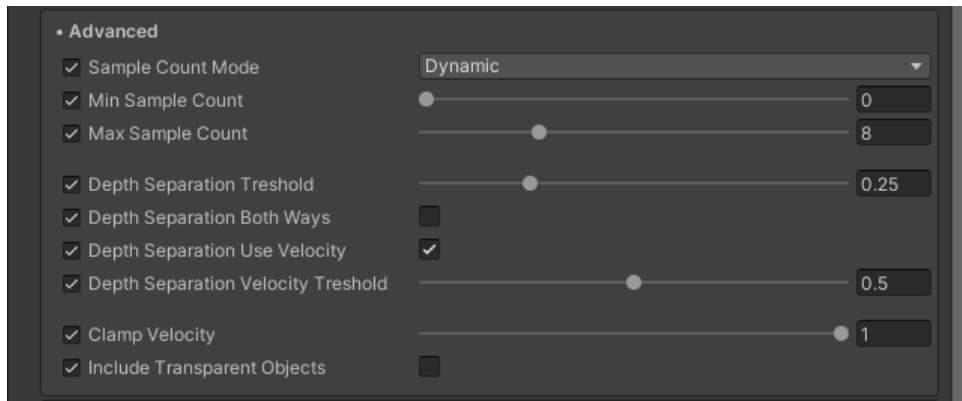
- **Sample Count Mode**

    - **Fixed** – Lets you set fixed number of samples – this samples even low velocity pixels with set number of samples.
    - **Dynamic** – Calculates the Sample Count from velocity, clamped by **Min/Max Sample Count** – this can save performance in low velocity movement.

- **Blur Samples** – Number of samples used for the blur effect when **Fixed** mode is used – higher values give nicer/smoother results but is also more demanding – *recommended value is ~6*.
- **Min Sample Count** – Minimum sample count used by **Dynamic** mode.
- **Max Sample Count** – Maximum sample count used by **Dynamic** mode.
- **Depth Separation** – Isolates object motion by depth, so that closer objects don't bleed color to further ones.

    - **Treshold** – Distance treshold above which the bleeding is cut off.
    - **Both Ways** – Force separation both ways, separates objects completely but can lead to unrealistic visuals.
    - **Use Velocity** – Include velocity in calculations. This ensures that objects with the same/close velocity are blurred together even if they are far away from each other – This option degrades performance.
    - **Velocity Treshold** – Minimum difference in velocity to consider objects moving at different speeds.

- **Clamp Velocity** – Clamps the velocity to set value, prevents over blurring.
- **Include Transparent Objects** – includes transparent objects in calculation, use this with caution as objects seen behind transparent surfaces will be blurred by the transparent surface velocity.

Debug Options:
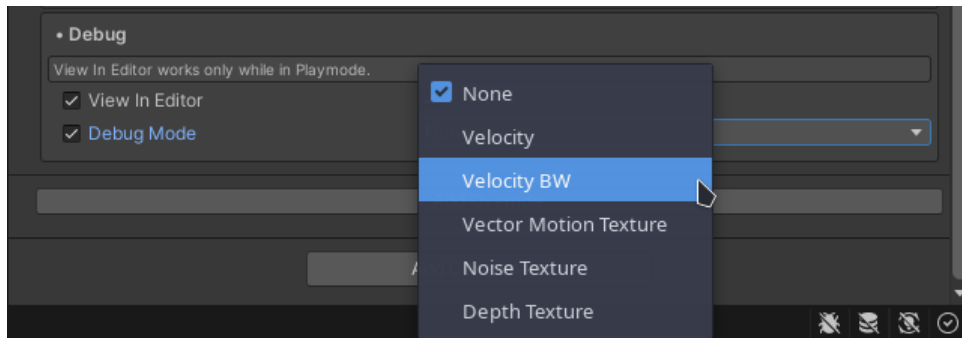
- **View In Editor** – Lets you see the effect in editor window. **Works only in Play Mode** and when Play Mode is paused gives incorrect results.
- **Debug Mode** – Lets you preview:

  - **Velocity** – Calculated Velocity in Red (x) and Green (y) colors.
  - **Velocity BW** – Calculated velocity in Black and White colors.
  - **Vector Motion Texture** – RAW motion texture calculated in *Vector Render Pass*.
  - **Noise Texture** – Currently used noise used to prevent banding.
  - **Depth Texture** – Depth texture used for *Depth Separation*.
  - **Dynamic Sample Count** – Color overlay corresponding to number of samples used.

Tested on

- Unity 2021.3 Universal Render Pipeline 12.1.8
- Linux and Windows

Limitations

- Objects ignored by the **Included Layers** option will be blurred by objects moving behind them.
- **Opaque Particles**: Opaque particles give incorrect motion vectors. Please exclude them via Layers or set particles **Enable Mesh GPU Instancing to true** if possible.
- **URP 14.0.6**: Terrain is being constantly blurred, workaround for this issue is to check **Draw Instanced** option under terrain settings.

Have questions?

I hope you enjoy the asset. If you have any questions, feel free to contact me via email <u>vincurek.f@gmail.com</u>.

Online version of this documentation can be found here:

<u>TinyMotion | Object Motion Blur for URP – Documentation</u>