

Move Up to Variable Rate Shading Tier 2 with Intel® Arc™ Graphics

The Intel® Arc™ A-series GPU is the first from Intel to enable variable rate shading (VRS) Tier 2, which boosts performance gains with minimal impact on visual quality. Intel experts Megan Weicht, Marissa du Bois, Adam Lake, and Aria Kraft detail in a white paper the advantages of VRS Tier 2 and offer a sample project that illustrates these improvements. Read on for excerpts from this white paper that highlight this new technology.



Why VRS Is Important

VRS Tier 2 gives you more control over the trade-off between visual quality and performance by dynamically controlling rasterization.

VRS Tier 2 means you spend less time on low-visibility regions and spend more time on high-visibility regions. The Intel team achieved close to a 4x speedup compared to a non-optimized implementation.

VRS Tier 2 gives developers more granularity than Tier 1 by making it possible to adjust shading rates per primitive, and/or by using a screen-space image. We explored this exciting new feature by implementing Velocity and Luminance Adaptive Rasterization (VALAR), which uses a combination of luminance and motion vectors to determine where the shading rate can be strategically reduced to increase performance without diminishing perceptible quality.

Gaming with VRS and Intel® ARC™ A-series GPU

This GPU supports Microsoft DirectX® 12 variable rate shading at Tier 1 and Tier 2. This means you can set the shading rate via an image mask or per-primitive, and combine these shading rates with a flexible shader-combiner API.

Intel and Tripwire integrated the significant gains of VRS Tier 1 into the *Chivalry II* game. Frame latency was reduced with a negligible loss in visual quality. With Tier 2, you get additional degrees of control; the shading rate can now vary per image tile and per polygon.

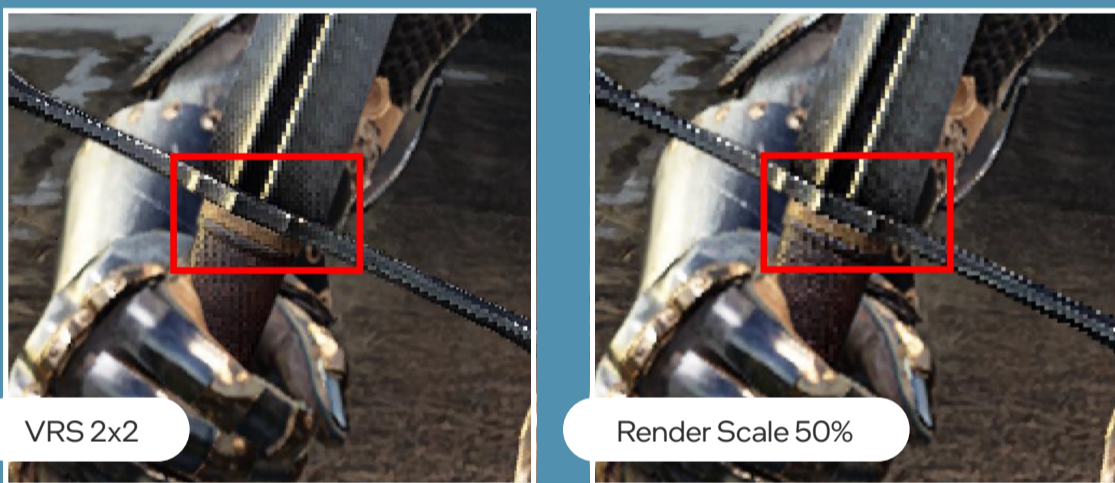


Figure 1. An image from *Chivalry II* shows the edge-preserving quality of Tier 1 variable rate shading. Tier 2 offers even finer control.

Integration into the Microsoft DirectX® 12 MiniEngine

To see the benefits of next-level VRS, integrate the code sample from the white paper into your own project.

The goal of this project was twofold: This code sample can be used as a learning tool for others to add VRS Tier 2 into their own project, and we also wanted something that could be used for testing performance and quality on various hardware and settings. The MiniEngine UI exposes different shading-rate-related settings, per technique.

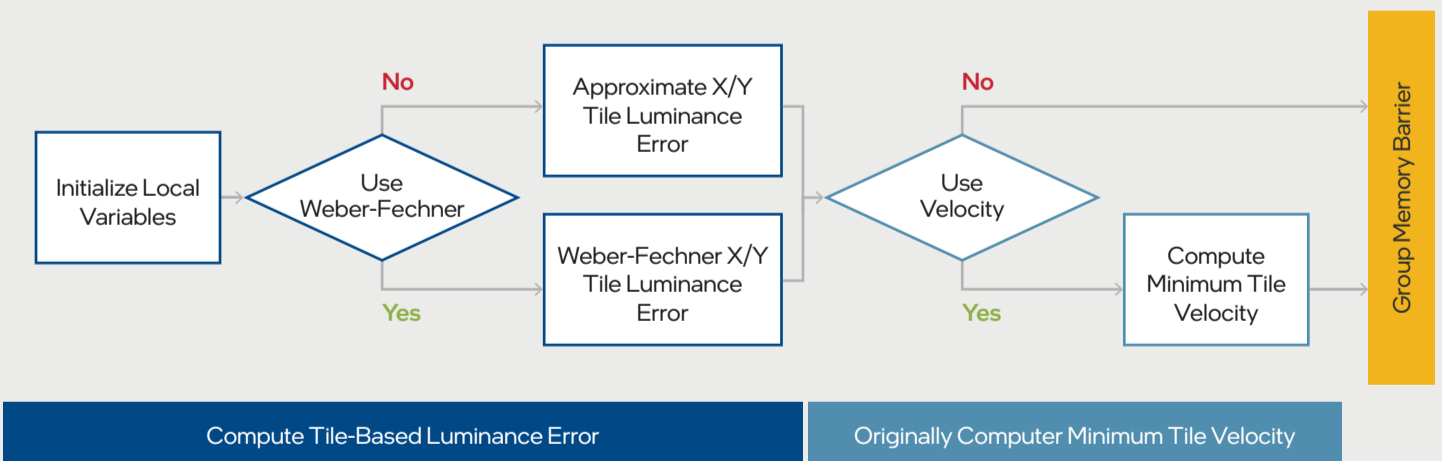
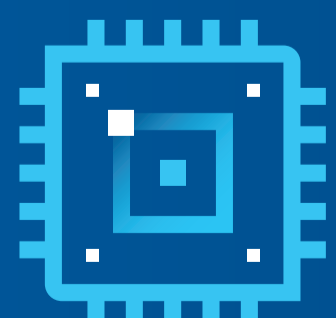


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Next Steps

This is just a glimpse of the possibilities afforded by VRS Tier 2 with Intel Arc graphics.

- Read the White Paper: [Velocity and Luminance Adaptive Rasterization Using VRS Tier 2](#)
- Download the Sample Project



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