How to optimize real-time AO

[1]

Brian Will, *OpenGL - SSAO (screen space ambient occlusion)*, (Aug. 18, 2019). Accessed: May 08, 2025. [Online Video]. Available: <https://www.youtube.com/watch?v=7hxrPKoELpo>

This youtube video by Brian Will explains a couple of things, he explains what ambient occlusion is, what screen space ambient occlusion (SSAO) is and how to implement it into OpenGl. This will be instrumental to implementing it in Vulkan.

[2]

Low Level Game Dev, *Advanced OpenGL Topics, BETTER SSAO: HBAO*, (Jan. 07, 2023). Accessed: May 12, 2025. [Online Video]. Available: <https://www.youtube.com/watch?v=fwaGQrQuvpk>

Simular to the previous source, this video by Low Level Game Dev talks about what Horizon based ambient occlusion (HBAO) is and the math behind it.

[3]

[Online]. Available: <https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=64477ce7ae737f6d44160c23f5afcd6870424c0d>

This chapter of “CPU Gems 2” talks about a type of ambient occlusion that does not really have a set name but for the sake of convenience, we’ll call it Surface Element Abmient Occlusion(SEAO)

[4]

L. Bavoil and M. Sainz, ‘Screen Space Ambient Occlusion’, 2008.

Articla by NVIDIA about SSAO

This article by NVIDIA talks about SSAO in detail and also tells us some things about HBAO.

[5]

‘(PDF) Image-space horizon-based ambient occlusion’, in *ResearchGate*, doi: [10.1145/1401032.1401061](https://doi.org/10.1145/1401032.1401061).

This is a short but detailed article about how HBAO works and the math behind it.

[6]

S. Graham and K. John, *Vulkan Programming Guide: The Official Guide to Learning Vulkan*. Boston Munich: Financial Times Prentice Hall, 2017.

This official Vulkan Programming guide will be instrumental in implementing anything in Vulkan.

[7]

[Online]. Available: <https://developer.download.nvidia.com/presentations/2008/SIGGRAPH/HBAO_SIG08b.pdf>

This presentation by NVIDIA details how HBAO works, the math behind it and gives clear examples on how to implement it.

[8]

‘There is a way to query GPU memory usage in Vulkan - use DXGI’. Accessed: May 19, 2025. [Online]. Available: <https://asawicki.info/news_1695_there_is_a_way_to_query_gpu_memory_usage_in_vulkan_-_use_dxgi.html>

This blogpost explains how to query GPU memory usage in Vulkan, this will be important to implement because it is necessary for the experiment.

[9]

‘john-chapman-graphics: SSAO Tutorial’, john-chapman-graphics. Accessed: May 20, 2025. [Online]. Available: <https://john-chapman-graphics.blogspot.com/2013/01/ssao-tutorial.html>

This article by John Chapman is a detailed explanation of how SSAO works and gives a tutorial on how to implement it.

[10]

‘Ambient occlusion’, *Wikipedia*. May 23, 2025. Accessed: May 20, 2025. [Online]. Available: <https://en.wikipedia.org/w/index.php?title=Ambient_occlusion&oldid=1291767983#cite_note-6>

The wiki of Ambient Occlusion gives a deep insight into what ambient occlusion is and a list of variants implentations.

[11]

J. Jimenez, X.-C. Wu, A. Pesce, A. Jarabo, A. Blizzard, and U. de Zaragoza, ‘Practical Realtime Strategies for Accurate Indirect Occlusion’.

This article by J. Jimenez goes very in depth into what exactly Ground Truth Ambient Occlusion (GTAO) is, all the math behind it and talks about how to implement it.

[12]

M. Pharr, ‘Ambient Occlusion Ambient Occlusion’.

This is a presentation from the GDC that talks about Ambient Occlusion, what exactly it is and different ways to approach it.

[13]

L. Bavoil and M. Sainz, ‘Screen Space Ambient Occlusion’, 2008.

This article talks about what AO is and the differences between SSAO and HBAO