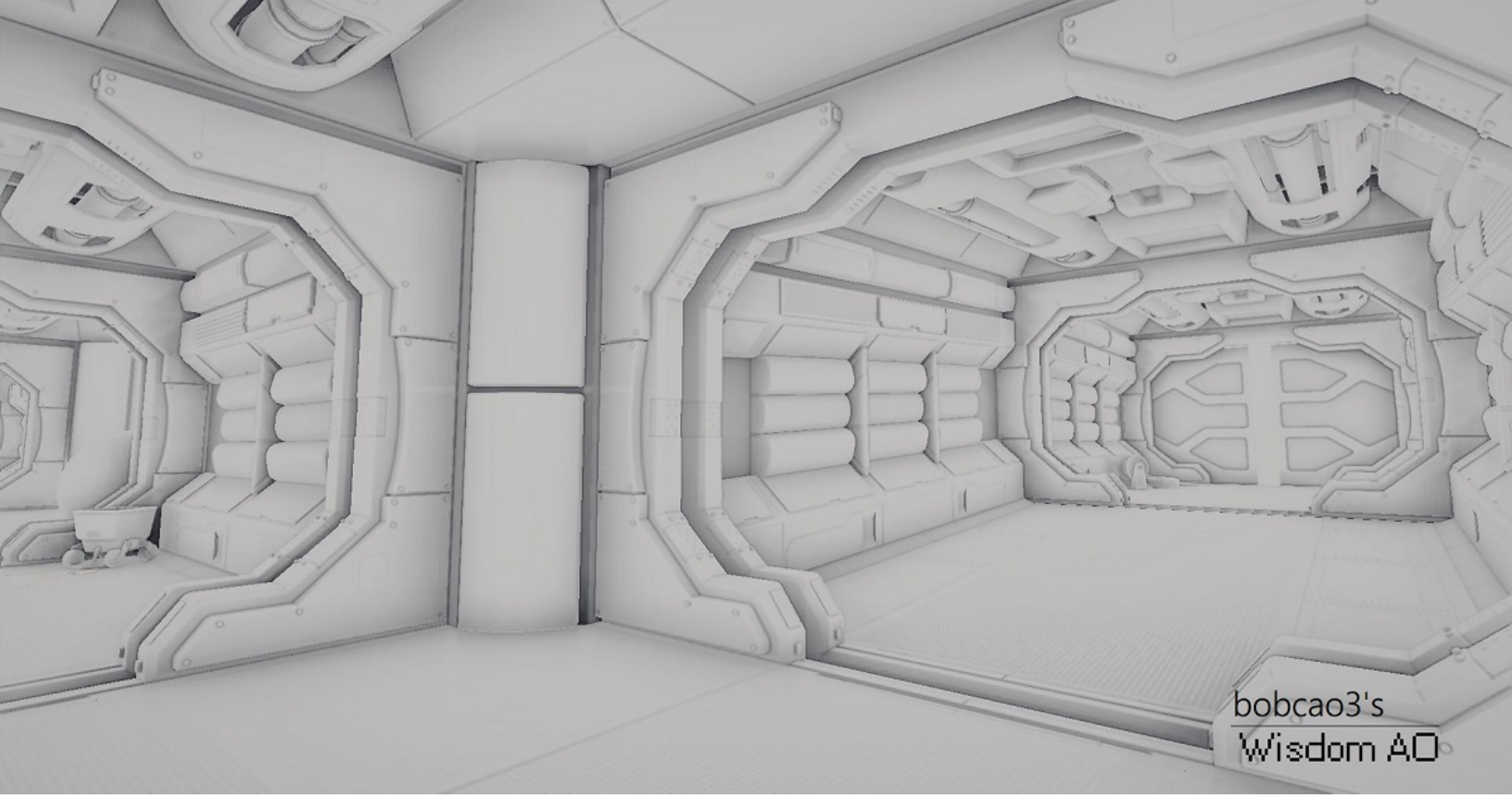


User Manual & Document - V0.4.3b

bobcao3's Wisdom AO

Introducing: Wisdom AO

Wisdom AO is an advanced Ambient Occlusion method that combines HBAO technique and SSAO technique. It optimized on HBAO's height-field marching. This Ambient Occlusion aimed at creating the most accurate occlusion.

Features

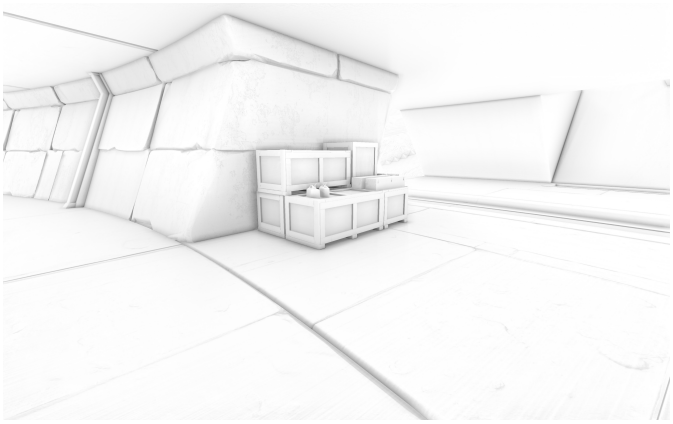
This ambient occlusion features a double frequency ambient map, which provides both detailed occlusion and wide range occlusion at the same time.

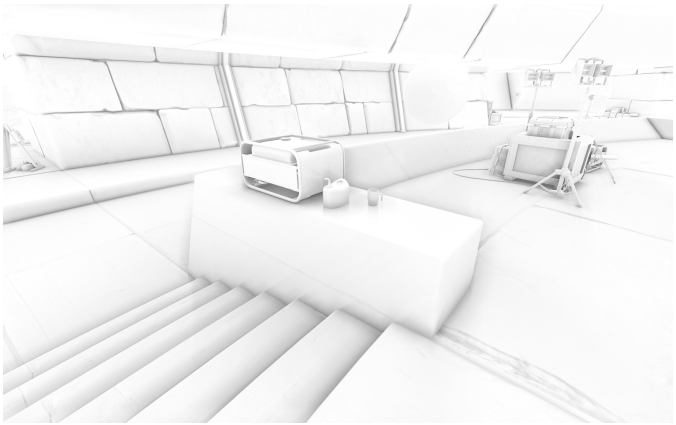
Why it's better?

It produces AO by calculating the occlusion angle, while traditional SSAO method only accumulates sample points. This provides the AO more accurate and smoother. At the same time, this pack provides you high scalability. You can go from a fast profile with adequate effect to an ultra profile to achieve more details and more quality results.

High compatibility: Console ready!

This effect works on `DirectX 11`, `DirectX 9`, `OpenGL` and `GLES`. Consoles (`PS4` and `XBoxOne`), and mobile (`GLES 3.1` & most `GLES 2`) are supported and ready to use! More than that, single-pass stereo is also supported!





Compatibility Details

1. The device must support Shader Model 3.
2. On mobile platform (GLES, Metal, etc.), the 4x4 arithmetic based bayer dithering will be replaced with a 3x3 array based bayer dithering method.
3. It supports XBoxOne and PS4.
4. Single-pass / multi-pass stereo VR is supported.
5. Wisdom AO supports occlusion on normal data. Due to the difference in the normal gbuffers from Unity3D, you can achieve the best quality on deferred rendering mode.
6. Sometimes other asset will hijack the normal buffer away and stop Wisdom AO from working properly. You can try to enable “generated normals” option to fix it. Be in mind that this could lower the quality of AO!
7. It hasn’t been tested on Unity 4. Use it on your risk if you use Unity 4.

Tweaking options & performance profile

There are several tweaking options available in this effect stack:

1. Frequency Multiplier
    - Two options available: Double, Single.
    - When choosing double, double frequency AO will be enabled. Single mode is ordinary AO
    - Double frequency will has a 1.7X performance impact. (Double is 1.7X slower than single, but with much better detail quality)
2. Samples Amount
    - There are four options: Low, Med, High, Ultra
    - **Low** = 6 sample direction with 1 sample depth (6 samples total)
    - **Med** = 6 sample direction with 2 sample depth (12 samples total)
    - **High** = 8 sample direction with 2 sample depth (18 samples total)
    - **Ultra** = 8 sample direction with 128 dithered rotation direction & 3 sample depth (24 samples with dithered rotation)
    - This option will directly affect the quality and the performance!

- Recommended profile combination: **Single Low**, **Double Low**, **Double High**, **Single Ultra**

3. Second Frequency Step
   - This option will only have affect on the double frequency.
   - This means the 2nd radius step from the first frequency.
   - You can play with this option to better understand its effect
4. Max Distance
   - The maximum distance the occlusion will be drawn (Distance cut-off)
5. Down Sample
   - Down Sample (or super sampling).
   - Down Sample = 0.5 means 2x super sample, down sample = 2 means half resolution
6. AO Radius
   - The radius of the occlusion
7. Angle Bias
   - The minimum angle (in cosine value) needed for occlusion to happen.
   - If you are using a low poly curvature surface (or curvature surface that haven't been subdivided enough), use this option to eliminate the occlusion in the contact edge of polygons. Since this AO algorithm is extremely sensitive, a small angle of occlusion will also been spotted and get occluded.
   - The recommended value is 0.1, which is about 5.7 degrees
8. Intensity
   - The linear intensity of the occlusion
9. AO_Exponential
   - The exponential intensity of the occlusion
10. Distance Bias
    - The maximum distance from the occluding object to the target object.
11. Variant Complexity

- Works well with double frequency.
- If the radius is low enough, the algorithm will use a lower but enough sample amount.

12. Use Generated Model
    - Use differential method (ddx & ddy) to calculate the normal from depth buffer. It should not been enabled unless the camera depth normal buffer is not available
13. Blur Method
    - Three options available: None, Simple, Advanced
    - None: no blur. Works best with Med or High sample amount in high resolution. Enable blurring will have performance effect!
    - Simple: simple one pass 5x5 blur
    - Advanced: 7x7 two pass bilateral blur with surface edge detection
14. Blur Radius
    - How far the blur will go. This will not effect the blur sample count!
15. Show AO Image Only
    - You can use this option to debug & tweak the AO effect.

At the end

If you have any problem, feel free to contact the author by email: bobcaocheng@gmail.com

Or you can contact me on the forum thread of this asset!

Please leave a review on the asset store if you are satisfied with this effect!