

Advanced Games

Render Options Quiz

R_s_l_t_o_

Resolution









Resolution Scale

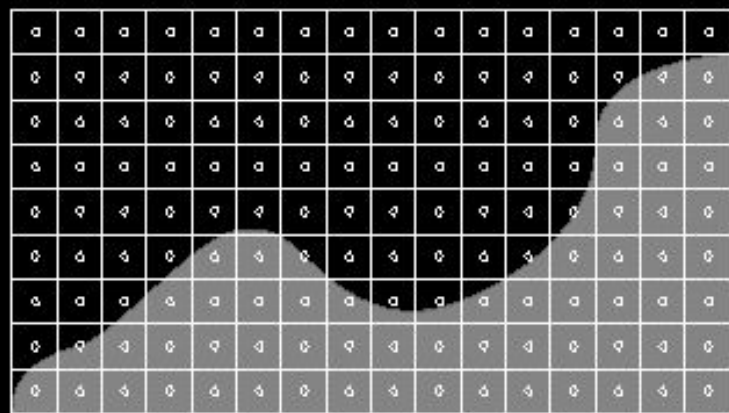
Dynamic Resolution

Dynamic Resolution

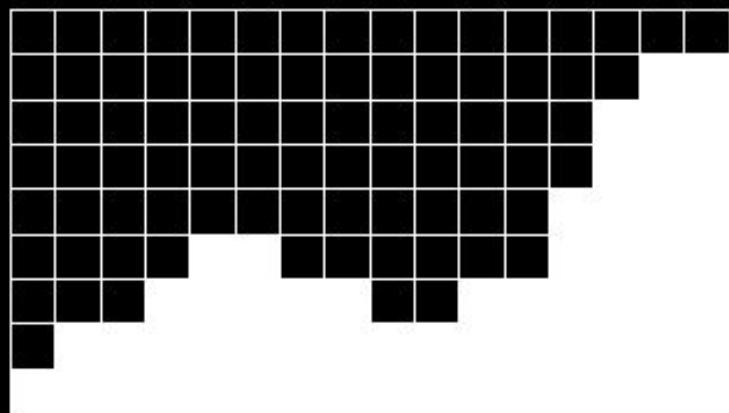
- 100% .. 50% ... 20% ...
- Automatic
- Super (>100%) aka Nvidia DSR

AA

Anti-Aliasing



(a)



(b)

Figure 1: Illustration of jaggies caused by sampling

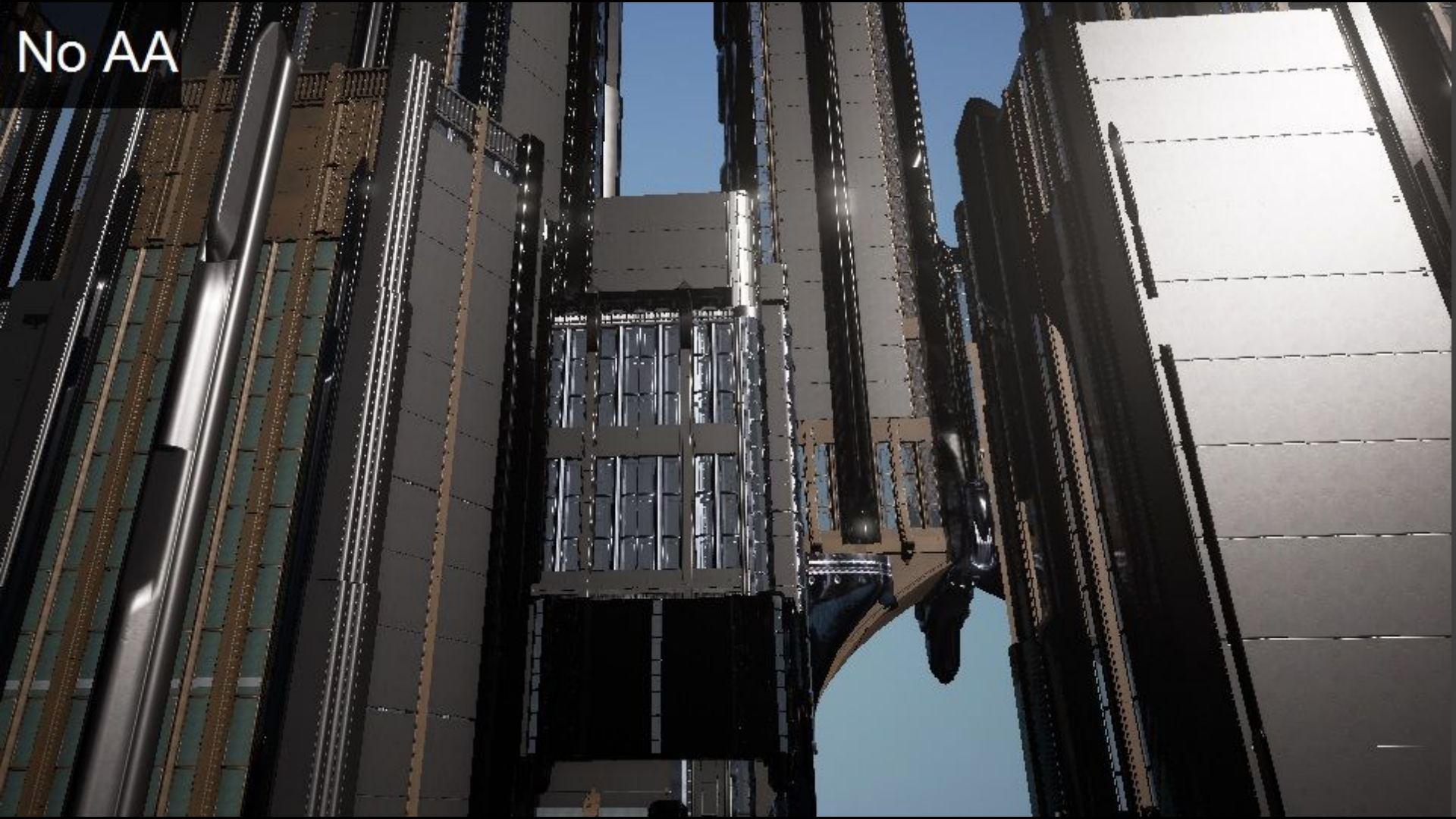
(a) Infinitely detailed curve

(b) Jagged sampled representation

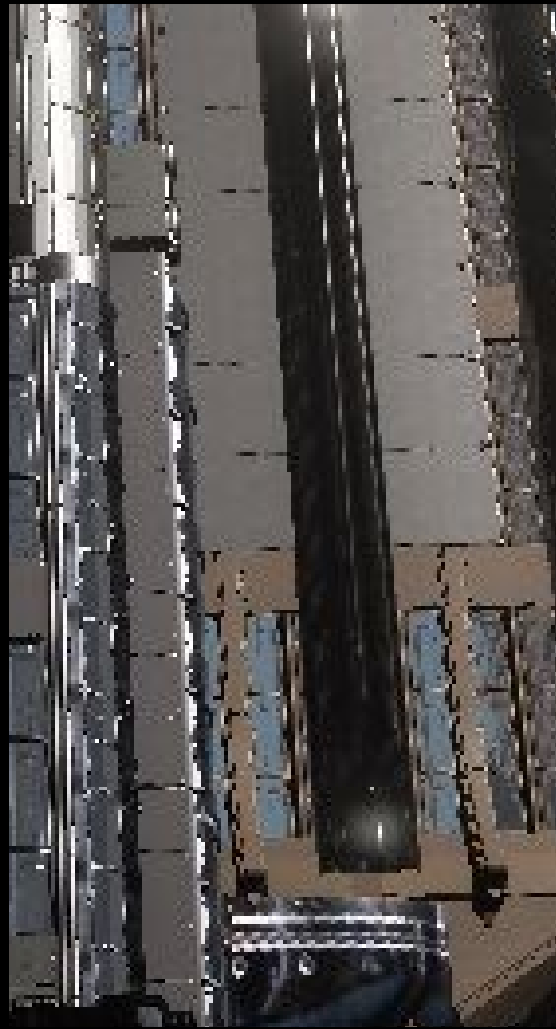


No AA





No AA



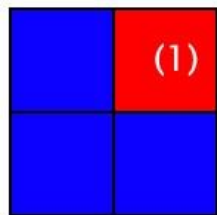
Aliased



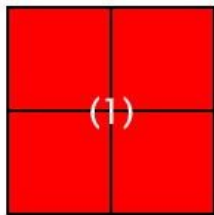
Anti-Aliased

Anti-Aliasing

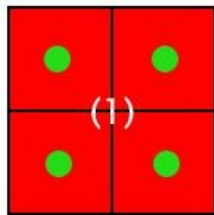
- **SSAA**
- Supersampling AA
- Render everything bigger!
- **MSAA**
- Multisample AA
- Do clipping and depth test bigger
- Fragment shader stays the same



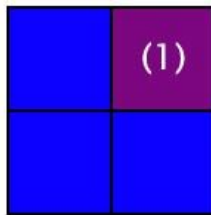
4 pixels



Pixel (1) gets supersampled to 4 times the resolution

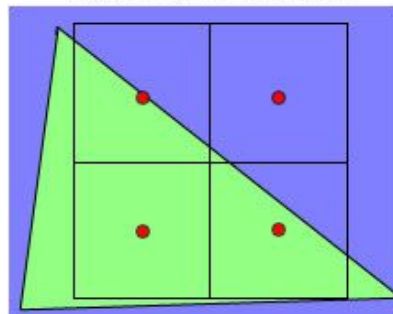


Colour averages are taken from the 4 points in the pixel

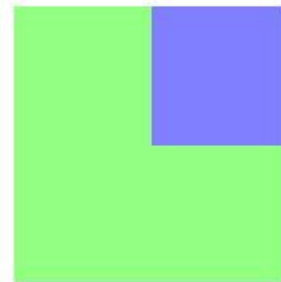


When downsized again, (1) is a blended colour

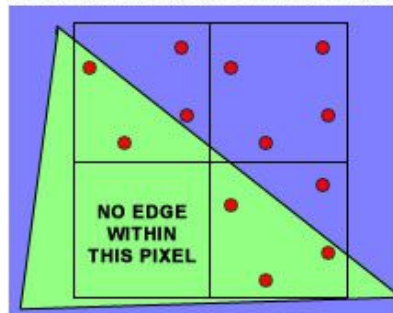
NO ANTI-ALIASING
1 SAMPLE PER PIXEL



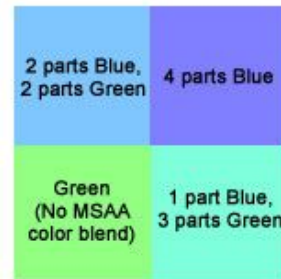
ALIASED
RESULT



MSAA
4x SAMPLE GRID PER PIXEL



MSAA RESULT
COLOR BLEND



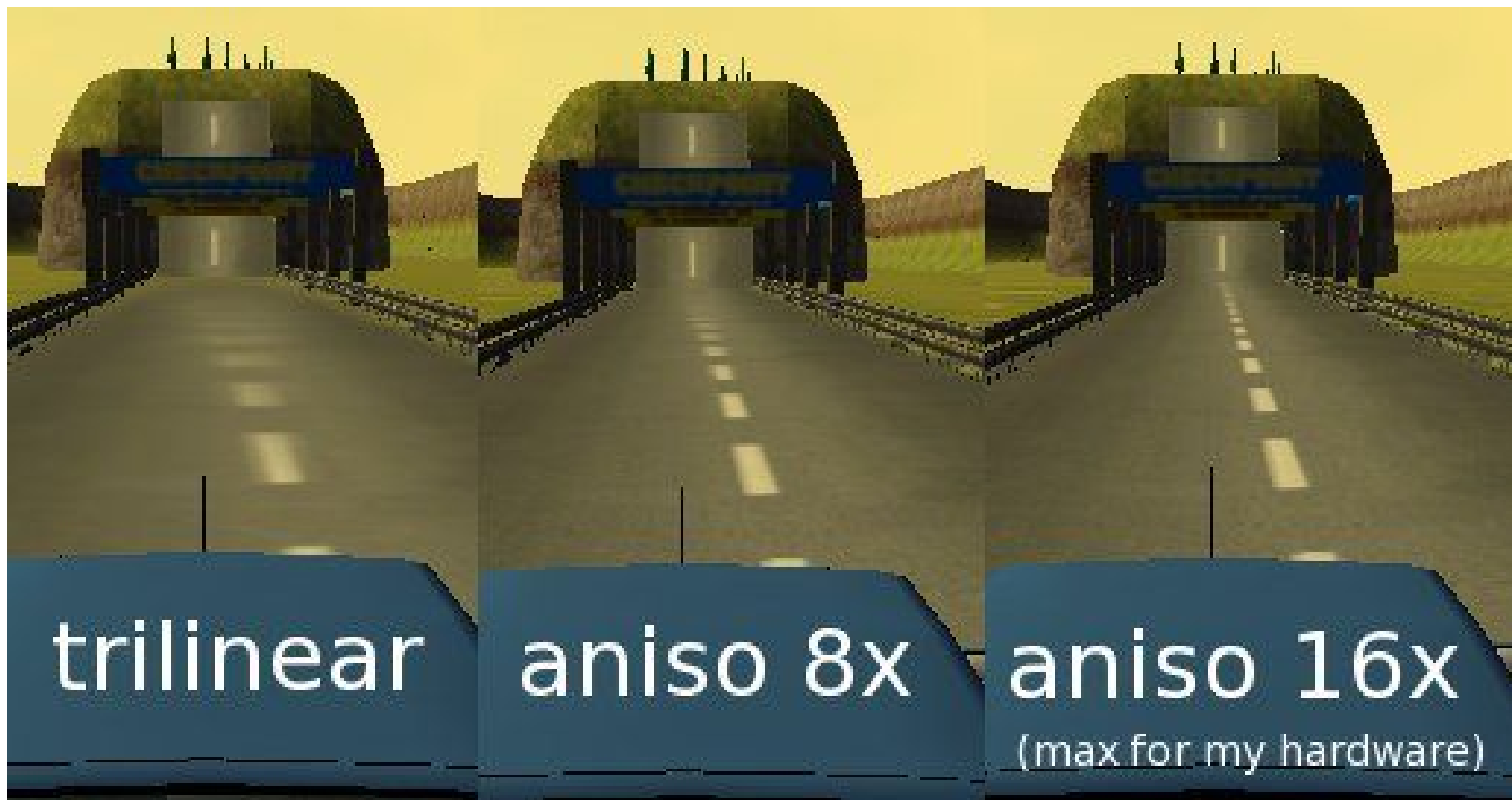
Anti-Aliasing

- **FXAA / POSTAA / SMAA**
- Fast approximate AA / Subpixel Morphological AA
- (~June 2012) Blur Everything

- **TXAA/MLAA**
- Temporal AA (Nvidia) / morphological AA (AMD)
- (~July 2012) Look at multiple frames

A_i_o_r_p_c
F_l_e_i_g

Anisotropic Filtering



B_O_M

BLOOM



SWITCH

BACKFIRE

100 %

1840

1

DART OVERLAY
100 %



IMAGE HINT!

A_b_e_t_o_c_u_i_n

Ambient occlusion

AO - Before



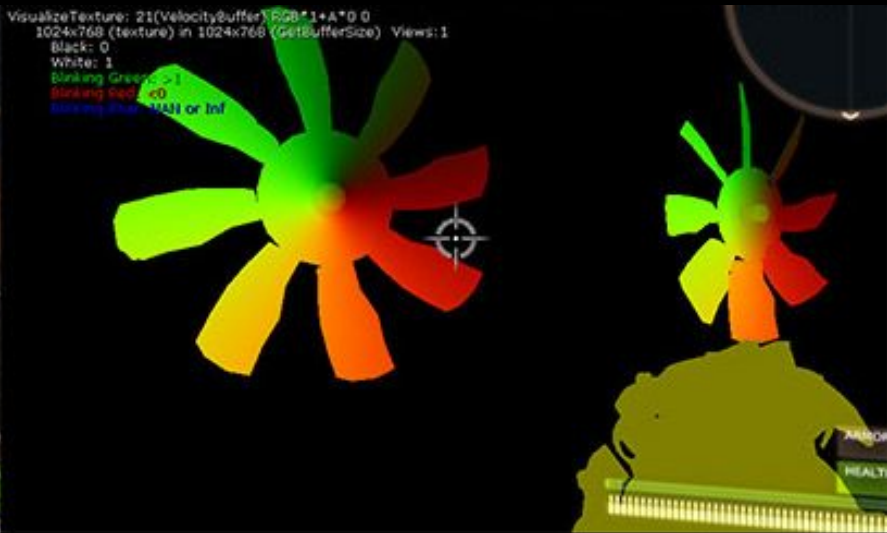
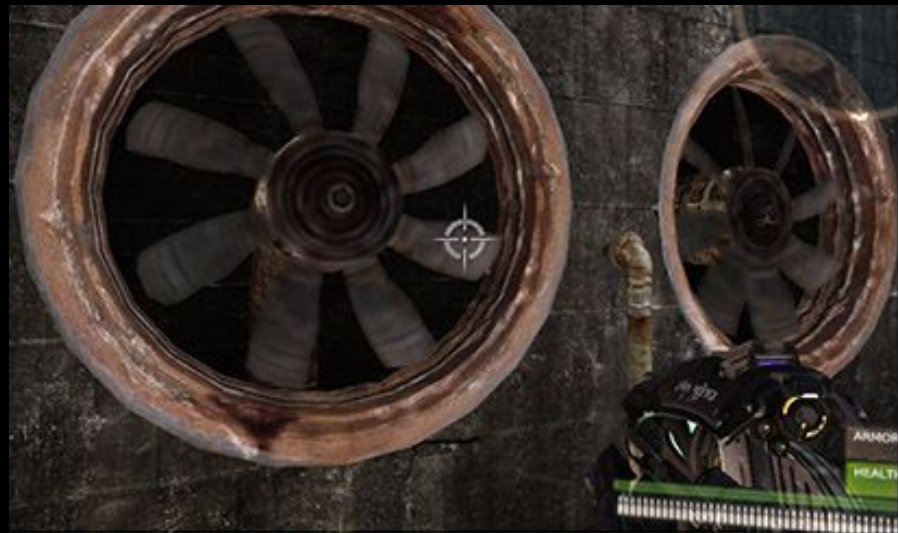
AO - AFTER



M_t_o_b_u_r

Motion Blur





T_s_e_l_t_o_

Tessellation



Forward: key W
Backward: key S
Move left: key A
Move right: key D
Up: key U
Down: key J
Run: key Shift

S_a_o_s

Shadows

Distance comparison

Resolution comparison

... and the rest

- Chromatic Aberration
- Depth of Field
- Detail Level
- Foliage Visibility Range
- Grass Density
- Light Shafts
- Number of Background Characters
- PhysX
- Sharpen
- Terrain Quality
- Texture Quality
- Vignette
- Water Quality
- Character Detail Distance
- Environmental Detail Distance
- Field of View
- Foliage Detail Distance
- Foliage Shadows Distance
- Light Shafts
- Texture Quality
- Wind Impulse