Post-processing effects

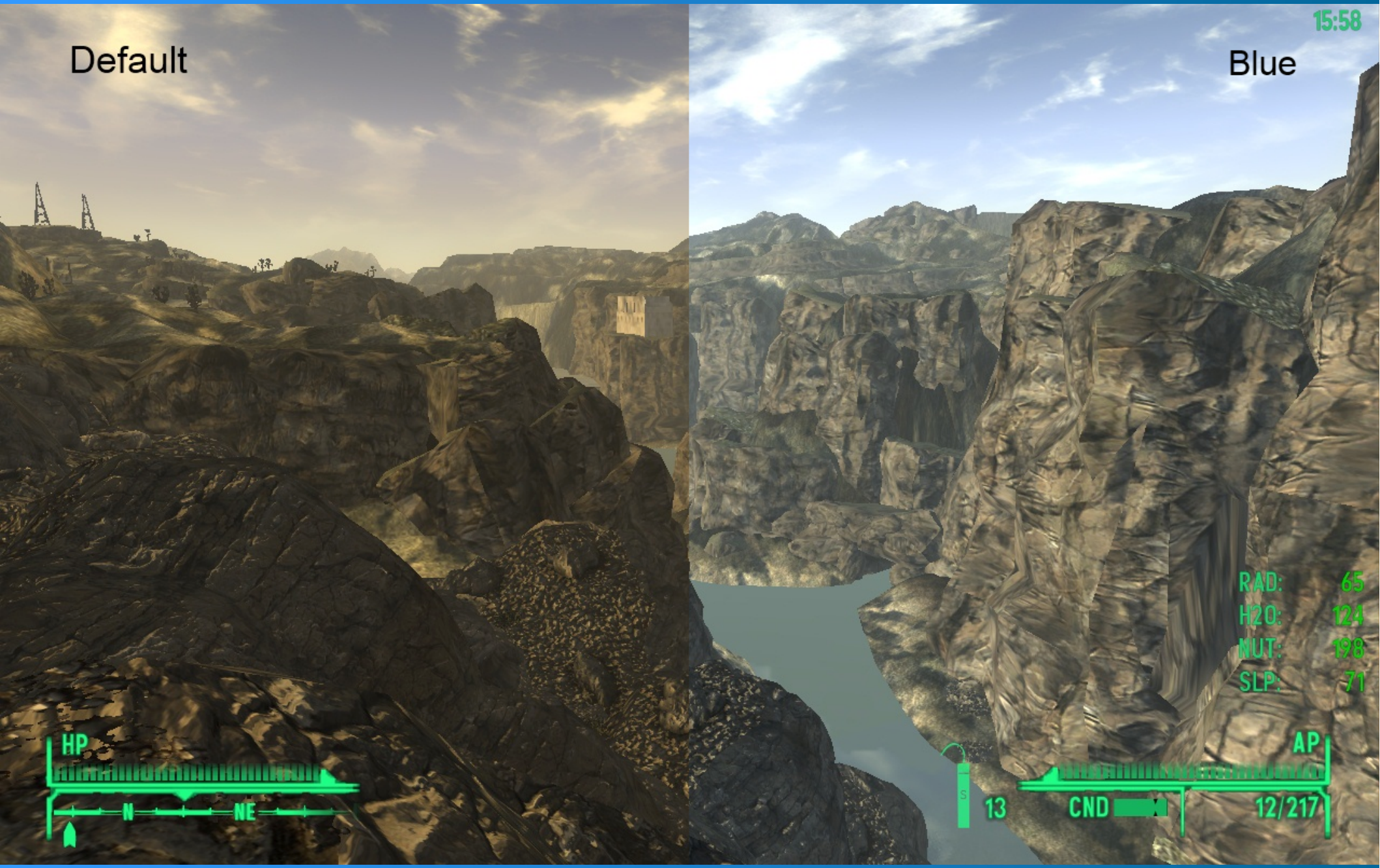
Morten Paluteder

Post-processing effect?

- Render the scene as normal
- Don't project to the screen, save
- Apply shaders
- Project the outcome

Default
15:49
RAD: 65
H2O: 123
NUT: 198
SLP: 71
HP
AP
N
NE
13
CND
12/217

Blue Tint
15:58
RAD: 65
H2O: 124
NUT: 198
SLP: 71
HP
AP
N
NE
13
CND
12/217


Default
Blue
15:58
RAD: 65
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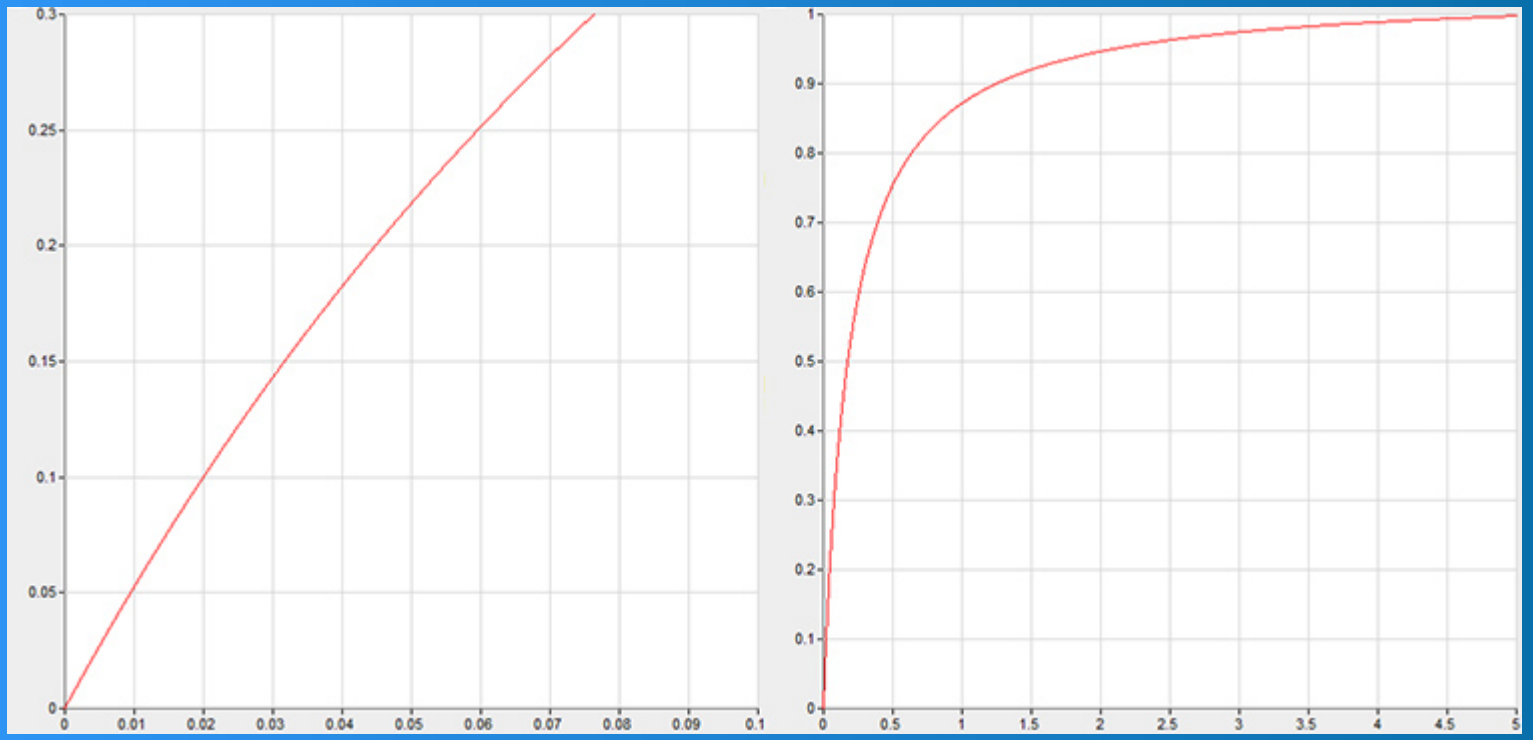
https://www.youtube.com/watch?v=3Asqn9SNTnk

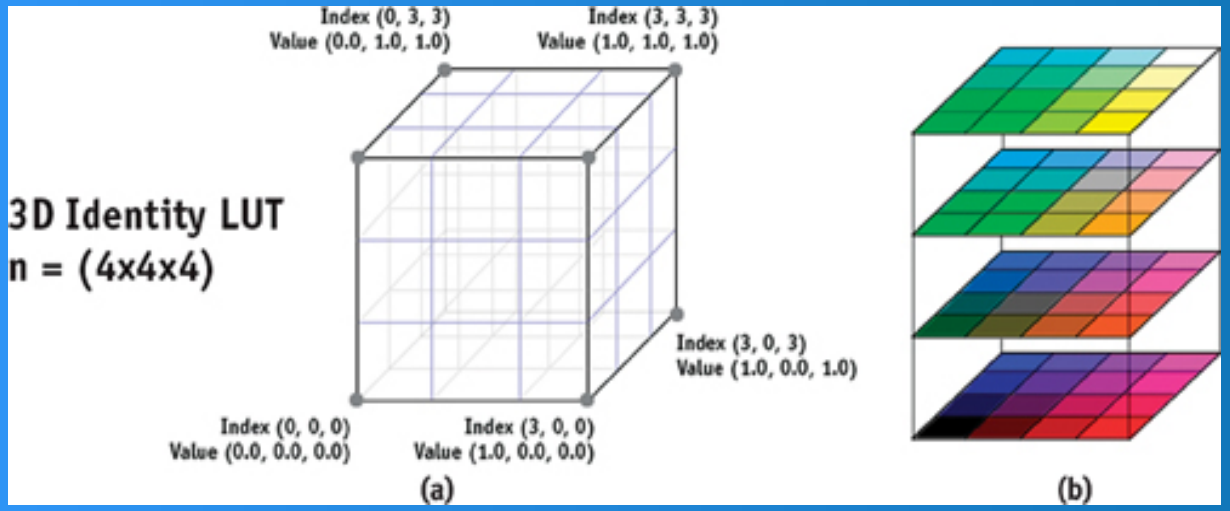
Color grading

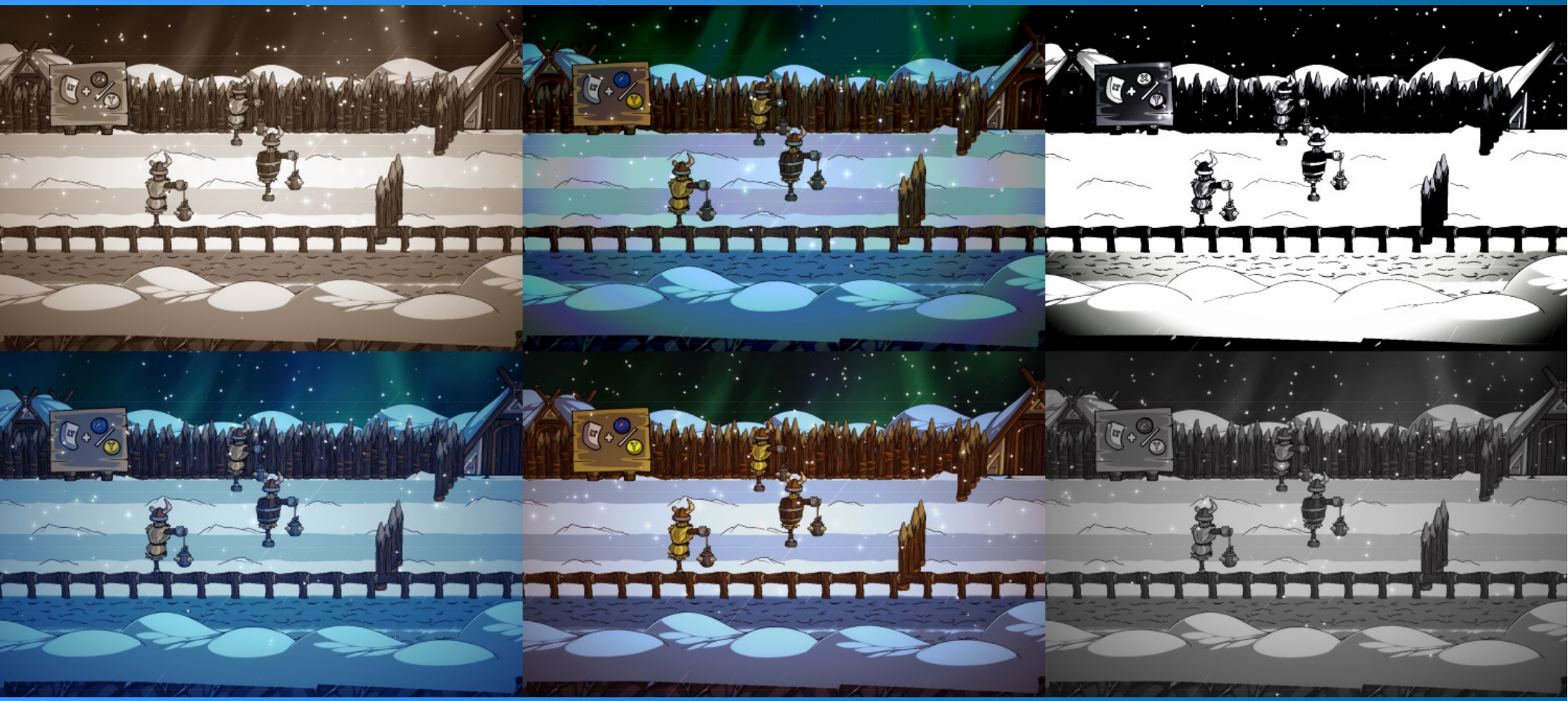
- Tone mapping - HDR (High Dynamic Range) to LDR(Low Dynamic Range)



Color grading

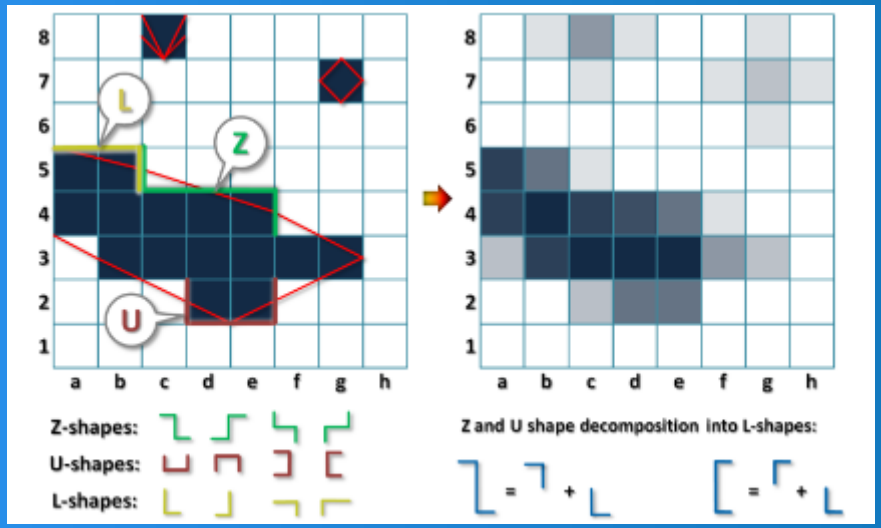
- Color correction
- 3D Lookup Table (16x16x16)





Antialiasing

- Blur the edges/contrasts
- MLAA, FXAA and SMAA



C:\Users\tyger\Desktop\SMAA-Enhanced-Subpixel-Morphological-Antialiasing.mp4

Eye adaption

- Low percent, high percent
- Min brightness, max brightness
- Speed up, speed down

Eye adaption

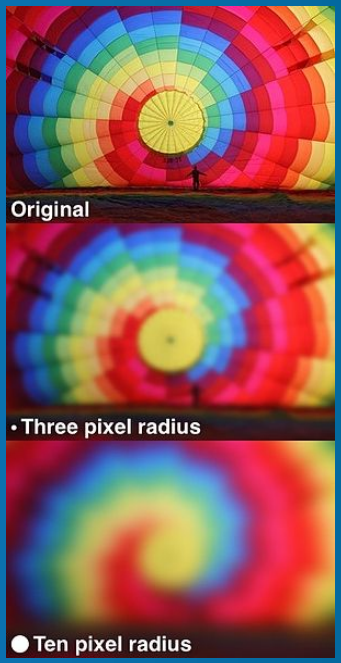
Example:
Low percent – 80%, High percent – 95%

- 80% of the screen pixels are darker than luminance value A.
- 95% of the screen pixels are darker than luminance value B.
- Average of A and B is C, current luminance

https://www.youtube.com/watch?v=5L4HTUS1RYE

Bloom

- Natural effect: dark objects near bright lights
- Can't display directly: no HDR support
- Uses gaussian blur



Bloom

- Threshold – required luminance for bloom
- Bloom dirt mask – brighten up bloom in some areas

https://www.youtube.com/watch?v=e6GM6R2zhBY

Motion blur

- Camera: shutter is open to give light
- Real world: eye sensor reaction time
- Mostly visible on 20-30 FPS/screenshots

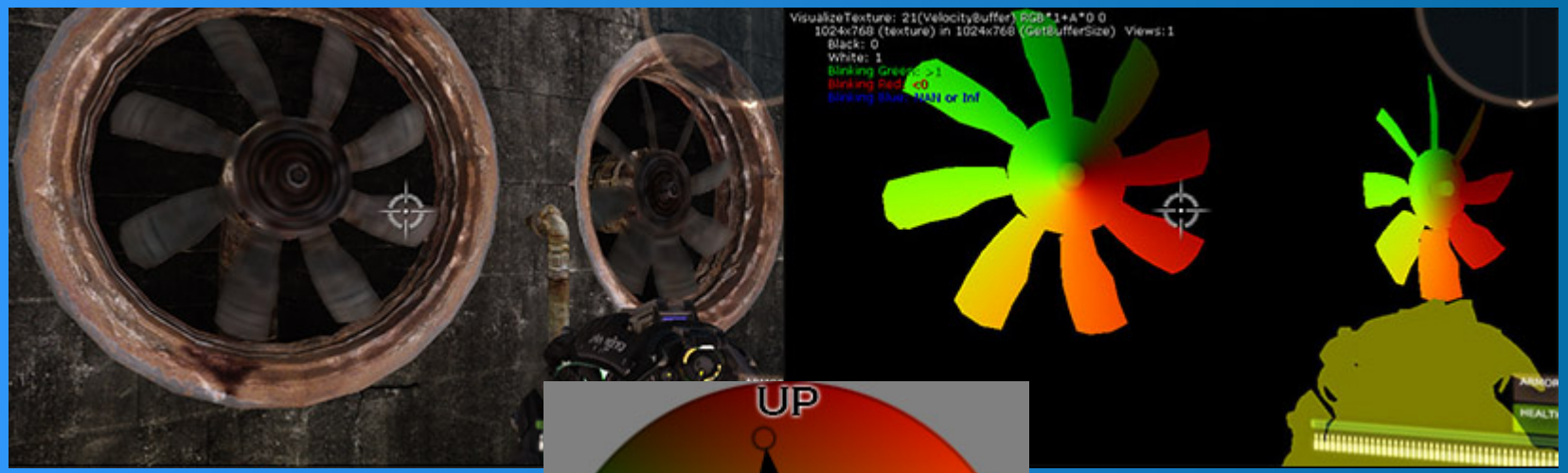
Motion blur

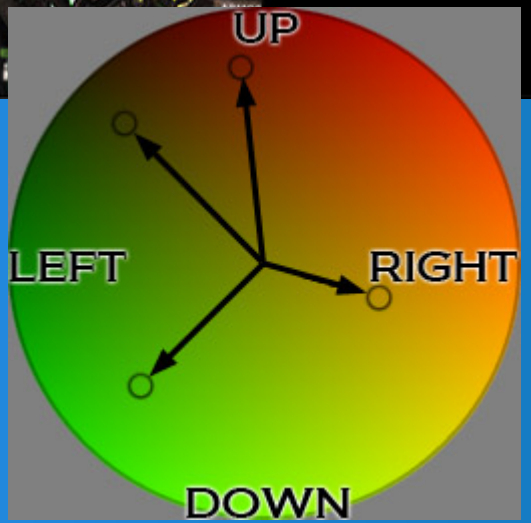
- Camera motion blur:
  2D VV: previous view matrix, current view matrix, pixel depth

Motion blur

- Object motion blur:

  Render geometry of all motion blurred targets



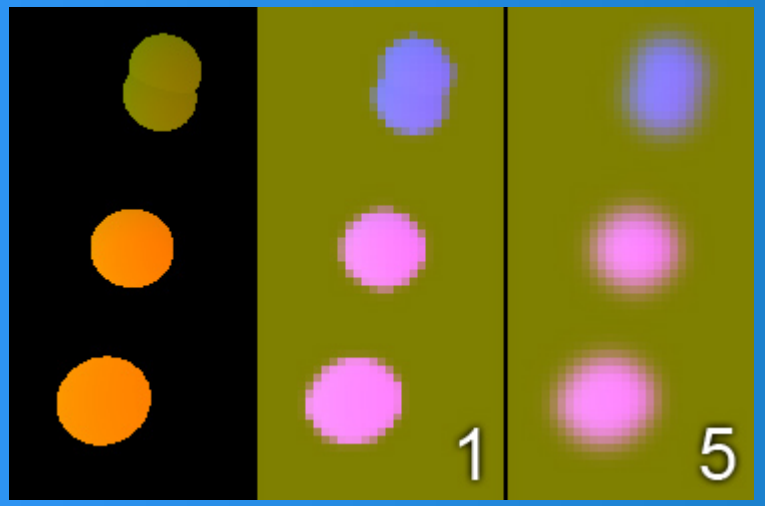


Motion blur

- Blend camera/object motion blur together
- Approximations

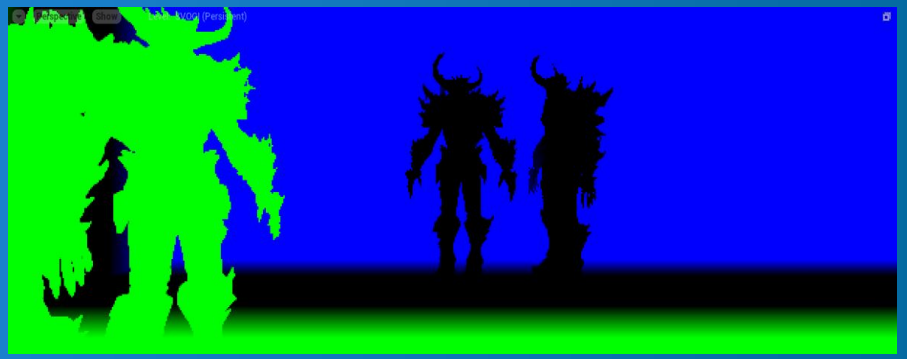
Motion Blur Softedge

- rrent
- ocity



Depth of field

- Applies blur to scene based on a central point (focal region)
- Three layers: near, far, focal



Lens flare

- Caused by imperfections of a camera lens
- Originates from a light source

Unreal engine 4 post-processing effects

https://www.youtube.com/watch?v=zzRsPFzu_DY

ENB

http://enbdev.com/description_en.htm

https://www.youtube.com/watch?v=_OFHllW_nDA

https://www.youtube.com/watch?v=tjZ1pII5188&feature=player_detailpage#t=42