Marshall Sharp — GAM206 Optimization.

Issues I have found in the code:

In the Level Prior to the fix, the Nav mesh didn't fully cover the map, causing the AI pathfinding for the minions to constantly try to get a reference to the players position, eventually causing overflow. Use of Viewport visibility options allowed me to discover this issue. Whilst it is a bug, it did leave a large Issue that could lead to optimization issues. This Issue also happens when the player Jumps, however this one cannot be avoided, the obj's will always rapidly increase when they player jumps or is otherwise airborne.

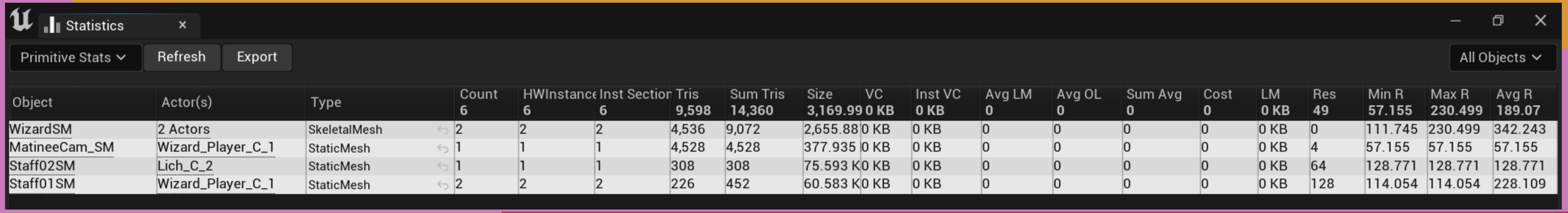
In the Current Code, the Projectile fails to spawn in the Projectile, as of current it is Unfinished in C++. However, the build has it working as a function, utilizing Blueprint.

Nav Mesh Problem

Nav mesh solution

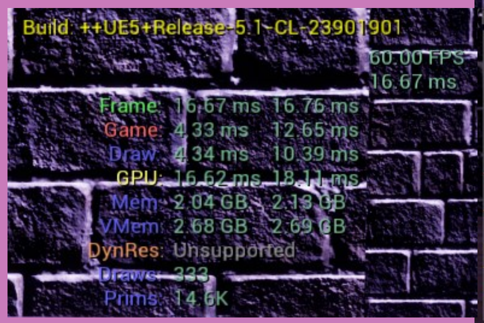
GitHub

The statistics menu is much easier to use in my opinion, which combined with other tools, can help lower polygons on models by pointing out which ones need to undergo retopology. Currently, the issue with high poly models cannot be resolved because I lack the skills to solve them, however in a team it would be extremely useful to do so, as you can point out to your artists and ask them to reduce the poly count of the problem model.

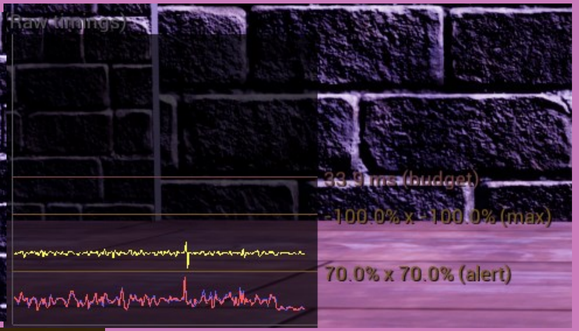


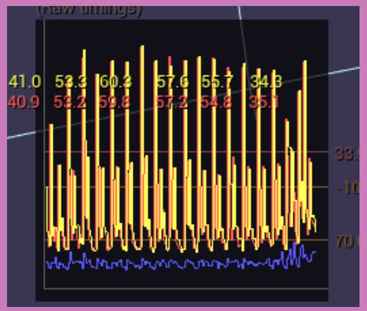
Object	Actor(s)	Type	Count	HWInstance	Inst Section	Tris	Sum Tris	Size	VC	Inst VC	Avg LM	Avg OL	Sum Avg	Cost	LM	Res	Min R	Max R	Avg R
			6	6	6	9,598	14,360	3,169.99	0 KB	0 KB	0	0	0	0	0 KB	49	57.155	230.499	189.07
WizardSM	2 Actors	SkeletalMesh	2	2	2	4,536	9,072	2,655.88	0 KB	0 KB	0	0	0	0	0 KB	0	111.745	230.499	342.243
MatineeCam_SM	Wizard_Player_C_1	StaticMesh	1	1	1	4,528	4,528	377.935	0 KB	0 KB	0	0	0	0	0 KB	4	57.155	57.155	57.155
Staff02SM	Lich_C_2	StaticMesh	1	1	1	308	308	75.593 K	0 KB	0 KB	0	0	0	0	0 KB	64	128.771	128.771	128.771
Staff01SM	Wizard_Player_C_1	StaticMesh	2	2	2	226	452	60.583 K	0 KB	0 KB	0	0	0	0	0 KB	128	114.054	114.054	228.109

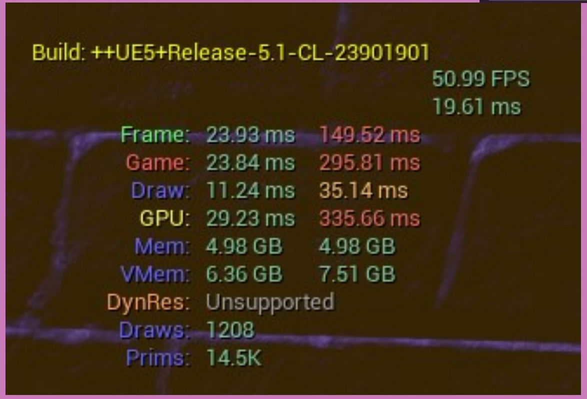
The detailed stats of the game can also be pretty useful, showing the developers the various statistics and what they could improve on, such as GPU usage , and frame rate. I found this useful for me, due to my use of marketplace assets, assets from Mixamo, it allows me to track the GPU usage of it.



```
Build: ++UE5+Release-5.1-CL-23901901
                                    60.00 FPS
                                    16.67 ms
   Frame: 16.67 ms  16.76 ms
    Game: 4.33 ms   12.65 ms
    Draw: 4.34 ms   10.39 ms
     GPU: 16.62 ms  18.11 ms
     Mem: 2.04 GB   2.13 GB
    VMem: 2.68 GB   2.69 GB
 DynRes: Unsupported
   Draws: 333
   Prims: 14.6K
```







```
Build: ++UE5+Release-5.1-CL-23901901
                                    50.99 FPS
                                    19.61 ms
   Frame: 23.93 ms  149.52 ms
    Game: 23.84 ms  295.81 ms
    Draw: 11.24 ms  35.14 ms
     GPU: 29.23 ms  335.66 ms
     Mem: 4.98 GB   4.98 GB
    VMem: 6.36 GB   7.51 GB
 DynRes: Unsupported
   Draws: 1208
   Prims: 14.5K
```

Laptop performance (RTX 4050, 16GB RAM, 512GB SSD, i7 13th gen CPU). This is used as a Baseline for high end PC's.

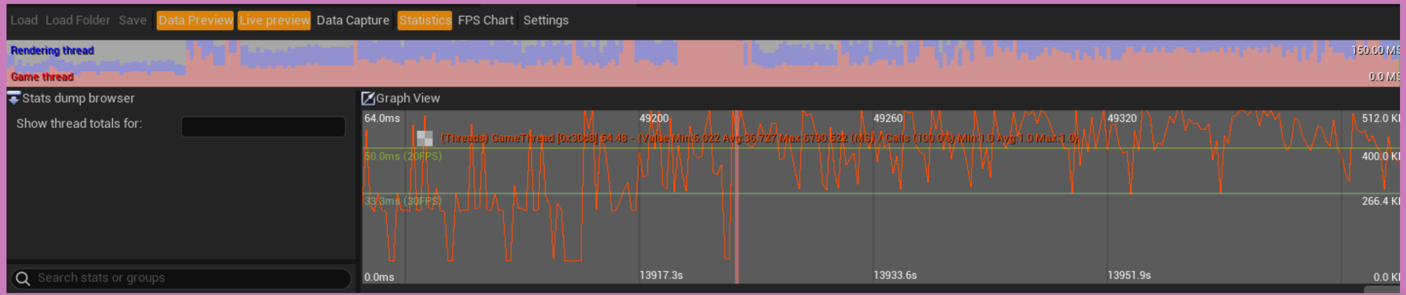
FPS: 120.2 / 8.3 ms Mem: 3,023.04 mb Objs: 40,518 Stalls: 4

After Optimization on a old GA warehouse PC (GTX 1050Ti, 1TB SSD, 16GB RAM, I7 8th gen CPU)

FPS: 68.8 / 14.5 ms Mem: 2,036.63 mb Objs: 40,784 Stalls: 5

Before Optimization on a old GA warehouse PC (GTX 1050Ti, 1TB SSD, 16GB RAM, I7 8th gen CPU)

FPS: 33.2 / 30.1 ms Mem: 2,315.65 mb Objs: 40,987 Stalls: 3



The frontend Profiler Shows off the Game thread and Rendering thread. It also displays the functions/events that are the most taxing, allowing you to see what is going wrong. Slightly cumbersome to setup. This is however, at the cost of reduced frames, so it is better to use, capture the data, then analyse it rather than constantly doing it live. My main issue illustrated with this tool include CPU stalls, for example.

This Works in tandem with the insight tool, which gives you more detail into the inner workings of the project, and allows you to outline more issues. One I got was about the bindings of the game and the controller, which I can fix by getting any gamepad and putting it into the PC. It will also reveal other messages along with CPU and GPU stats.