Robes & Wrinkles

Visual Overhaul

Overview

Following our team's acceptance into the government funded Tranzfuser 2024 competition, our initial goal was to hit the ground running and revamp how our game looked to better suit our audience and style. My role in this was to research, design and develop a shader that would suit our needs. To this end, I began looking into 3D games that implemented cell shading with a particular focus on outlines of objects. This log is a direct continuance into the improvement of the comic book style found at the end of "Dev Log 3". This log aims to cover in more depth the decisions made, reasoning and overall outcome.

Research

Cel-Shading/Outlining in Games

Initially, my focus was on looking at games across a range of genre and release periods to determine what differing methods were employed and if the methods evolved over time. This led to me studying the look and feel of games such as "Ultimate Spider-man" for the original Xbox, Borderlands 2 and, arguably the biggest influence on our art style, Hellboy: Web Of Wyrd.

Taking into consideration the overall art style we were aiming for and amount of detail we were putting into the game, I decided to discount Borderlands from major consideration. This was largely due to the difference in complexity and vision of our game's art compared to their own and, from a technical standpoint, I had to be realistic with my skill set. Following this, I began to collage key features of how both Ultimate Spider-Man and Hellboy used their cel-shaded styles.

Hellboy key art features:

- Harsh shadows
- Environment/Character outlines
- Simplistic art
- Black lines drawn on characters
- Low detail

MIKE MIGNOLA'S
HELLBOY
WEB OF WYRD

Ultimate Spider-Man key art features:

- Character outlines
- Textured art
- Clear and visibly thick lines
- Brighter art style

Taking into comparison these two styles, it was clear Hellboy was the better game for reference material on how to do outlining. This decision was made on the basis of how it used outlining on both environment and character models and also contained the more simplistic art style we were aiming for. Alongside this, Hellboy was a game I owned and was a more recent release which kept it both relevant and easier to access for immediate comparable reference.
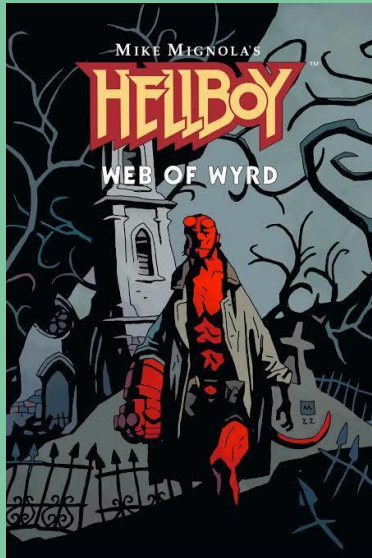

To make best use of Hellboy as a reference, I decided to find and get one of the comic books to compare comic-drawn outlines to in-game outlines to spot any key differences.
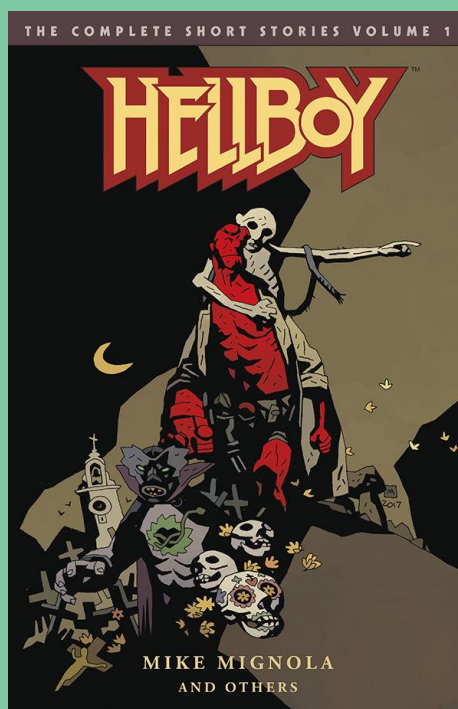
Implementation

Initial Pass

During the initial testing phase, the goal was to create outlines by inverting the faces. This helped to create the effect which was used as a shader and placed on materials.
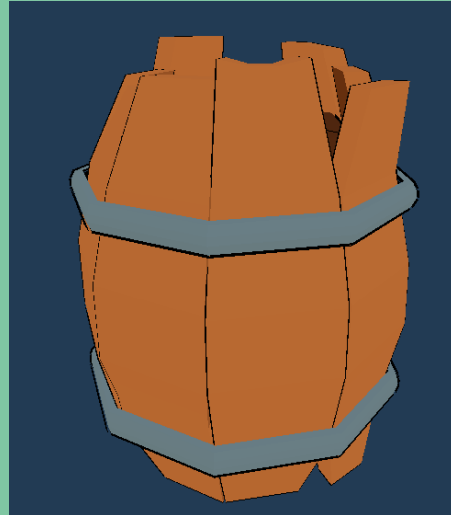

In order to make the outline as modular as possible, I designed into the shader the ability to adjust the outline "Size" (distance of normal from face) and also the colour. This allowed for quick and agile testing
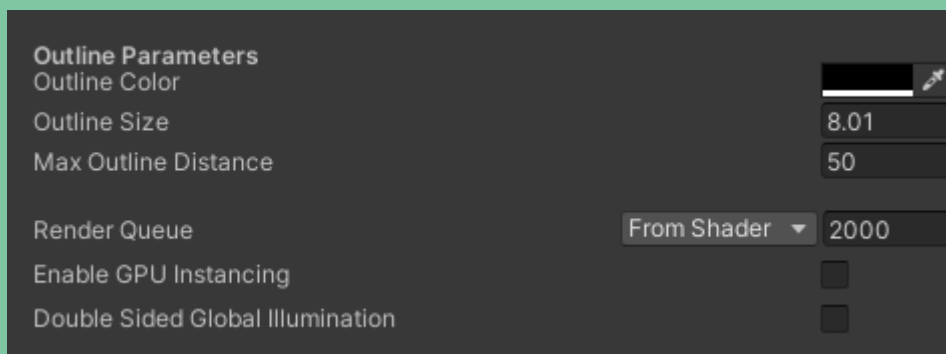
Initial Testing Overview

Looking at the initial pass, it was clear aspects would require improvements such as the outline width and way it curves around objects. One of the biggest limitations of this system was the way the outline disconnected from the mesh which caused visual glitches as shown below.
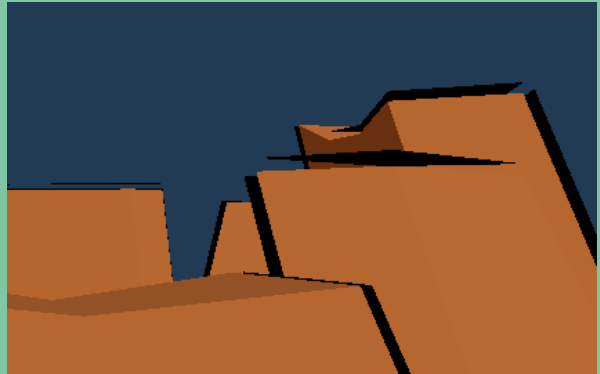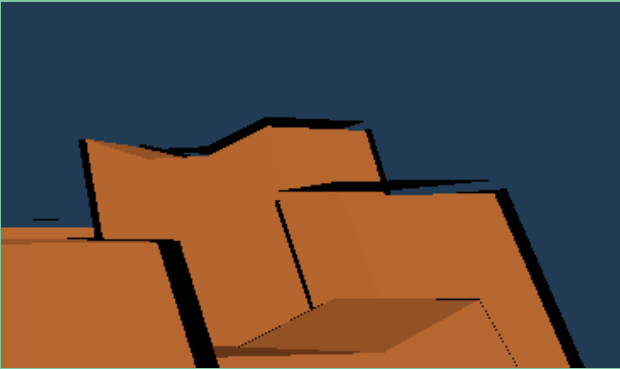
As an initial pass this method showed promise, however the restrictions of how normals behave and interact caused issues that could not be overlooked. Moreover, when applied to characters the shader struggled with much more complex shapes in some cases but with others it worked much better.
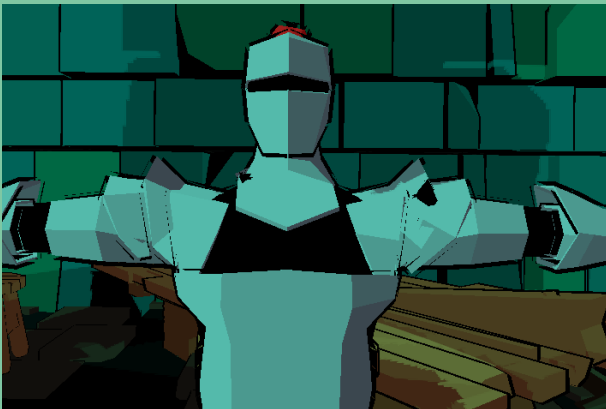

In conclusion of this initial pass, the method has been shown to be imprecise and random in its effectiveness but contained some useful aspects. Following this, the next method I attempted involved layering, duplicating objects and camera perspectives.

Improvements made

During the second pass, I developed a new shader which was used on a duplicate of the same object and coloured black. This was then used on all the objects material slots and sized up.

After the object was sized up, it helped to create the outline effect and performance wise had the same impact as the previous shader but with a better overall aesthetic.
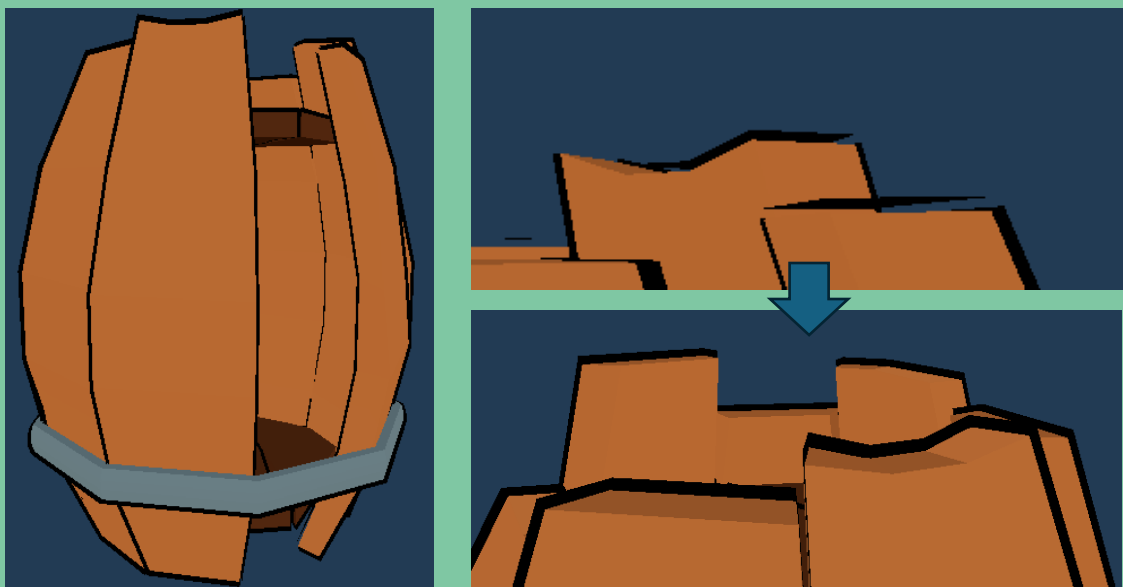
Conclusion Of Log

Recaping on my initial overview for this log, my goal was to design and develop a new shader that included cel-shaded outlining for objects to improve game feel and aesthetic. To accomplish this goal I performed research, gathered reference material and experimented with a few methods for implementation. The overall outcome was a new shader which outlines that improve upon the already exciting art style.