## Art Technology - By Atif Mahmud

Every artistic endeavor of mine starts with a set of restrictions because within the cracks of restrictions is where real creativity starts to sprout. For our demo we imposed several of these upon ourselves. Among these restrictions, one was that every asset in our final game must have been stylistically distinguishable from its source. Albeit vague, this restriction was the main motivating factor for the art technology I built for Gangplank. Also, among our restrictions was that we must include dynamic lighting (with the intention that it drives gameplay in some way down the line).

With some of these restrictions defined, I can discuss the artistic challenges we faced. First, the main contributors to Gangplank are mostly developers with a little 3D modelling experience; however, we settled on a 2D pixel art style for our artistic vision. As a result, creating assets was a challenge. To tackle this we decided to use 3D assets to design our tilesets, levels, props and characters and find out how we might convert them to 2D. Simple enough right? Just take some low resolution photographs of the 3D assets and turn off anti-aliasing. This however brings us to the second restriction.

Dynamic lighting was a cornerstone restriction of our game design as again, we intended to use it to drive gameplay. As a result, simple low resolution models wouldn’t cut it because we’d lose all the lighting information. So how did we solve this?

**Automating Animated Sprite Creation and Normal Map Capture**

I wrote a script to make use of the 3D lighting information to compute the normals and generate normal maps for every texture we wanted to use in our game, including animated sprites. This improves our pipeline two fold. One, we can now have beautiful dynamically lit pixel art in our game and two, we have significantly compressed our game size by only involving 2D assets.

Applying a pixel toon shader I wrote that uses these normal maps and the textures diffuse maps, brings the lighting to a new level by giving the effect of baked pixel art shading but with dynamic directional lights (shown in the attached mkv files).

Some of these generated normal maps and sprites are included in the press kit and a more comprehensive demo is included in our project showcase and game demo.