

## **Final Project Proposal**

### Team Members

Carolyn Lai - 89089268

Wesley Tseng - 22428172

### Goal

To implement stylized cel shading onto standard objects and scenery in WebGL

### Major Area of Focus

We will primarily be focused on the shading aspects of 3D modeling for our final project and will attempt to recreate a toon-like shading style for objects. As a result, most of the code written will be in a Javascript file. If time persists, we will make a custom interface for the front-end so users can see adjust the parameters and see different levels of cel shading.

### Details

Our goal is to create a stylized cel/toon shader that will ideally recreate the look of cartoons and anime. To achieve this, we will need to look into the usage of multi-pass rendering, which will require the implementation of additional shaders in addition to the normal vertex and pixel shaders such as an outline shader and a cel pixel shader. The implementation of a cel shader will require understanding of the concept of discretizing color - that is, bounding the intensity of the light into a handful of categories.

For our shader, we will initially discretize color into 4 categories and attempt to experiment with transitioning our shader from smooth, interpolated shading to blocky, well-defined sections of color. After grasping the basics of cel shader implementation, we will then implement the outline shader to give our objects and/or scenery a traced or “penciled” look commonly seen in animated films. Once the cel shader is working with 4 levels of color discretization, we will work on implementing a broader and more flexible version of our cel shader that will allow users to set the levels of color discretization for more flexibility.

Following a successful basic implementation of our cel shader, we will add textures onto our objects and scenery. If time permits, we will implement adjustable settings where users will be able to adjust the level of detail and zoom on the textures to give the objects different levels of granularity. We will also implement adjustable parameters for the users to interact with and dynamically change the lighting angles of the object/scenery as well as its intensity.

### Possible Stretch Goals

- Implementing white highlights on objects
- Adjusting the shadows casted on the objects

## Schedule

*May 23 - May 27*

- Wesley
  - He will look into the HTML side of the project and think about how to present cel shading on an object via the canvas. He will also look into what is the best way to allow the user to switch between regular shading and cel shading.
- Carolyn
  - She will begin looking into the cel shading code and figuring out the differences between cel shading and regular shading. She will also be looking into what kind of shaders will be needed to create the cartoon-like appearance.

*May 28 - June 4*

- Wesley
  - Ideally the settings and canvas to present the cel shaded objects will be completed by this week. This will allow him to direct his attention to assisting Carolyn in implementing the cel shading algorithms.
- Carolyn
  - She will help verify that the HTML side of the project is fine and is setup correctly. Other than that she will continue focusing on the cel shading algorithm and implementation.

*June 4 - June 12*

- Wesley
  - He will be working with Carolyn to wrap up the cel shading algorithm and implementation and will turn his attention to focus on the detailing for the scenery. If time persists he will work on implementing textures for the objects and look into having users affect the cel shading via sliders.
- Carolyn
  - She will be wrapping up the cel shading implementation and assisting Wesley in detailing the scenery and implementing textures for the objects if time persists.
- By this time the base function of the project will be done and the cel shading aspect of the project should be completed.