Brown CS2240 Final Project Proposal
Foo

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1 INTRODUCTION

We want to make a non-photorealistic render. When you import a 3D model or 3D scene in, you can choose to render it in watercolor style or pencil drawing style. If possible, we want to make it real-time and support some other NPR effects as well.

2 FEATURES

(1) watercolor rendering. Shader programming. [2]
- Controlled Object-space Effects: color bleeding technique and hand tremors effects.
- Watercolor Reflectance Model and Pigment Turbulence.
- Controlled Image-space Effects: Edge Darkening, Paper Distortion and Granulation.

(2) pencil rendering. [1] [3]
- Contour detection and contour shaking.
- Multiple contour drawing effects.
- Pencil texture generation.
- Pencil texture rotation and 3-way blending.
- Compositing and enhancement.

3 EXTENSIONS

(1) Try using some other methods to implement the watercolor/pencil effect.

(2) Try implementing some other stylized NPR effect on our own.

(3) Real-time rendering.

4 TIMELINE

1st week (Apr. 7th - 13th): Read paper, build basic framework, set out implementing pencil rendering(finish contour detection and contour shaking).

2nd week (Apr. 14th - 20th): FInish implementing pencil rendering, set out implementing watercolor rendering(finish Controlled Object-space Effects).

3rd week (Apr 21st - 27th): FInish implementing watercolor rendering. Try implementing extension features.

4th week (Apr 28th - May 4th): Debugging, refining. Combine the separate two parts together, make an interface, prepare for presentation.

5 DIVISION OF LABOR

Kai Wang: Multiple contour drawing effects, Pencil texture generation. Watercolor Reflectance Model and Pigment Turbulence. Support real-time rendering.

Ruolan Tang: Contour detection and contour shaking, Compositing and enhancement. Controlled Object-space Effects. UI. Try implementing other NPR effects.

Tianmu Lan: Import and scene parsing. Pencil texture rotation and 3-way blending. Controlled Image-space Effects. Try implementing other NPR effects.

6 SKILLS AND EXPECTATION

Kai Wang:

Skills: C++

Predict to Acquire: more in depth knowledge about NPR

Ruolan Tang:

Skills: C++ and basic graphics knowledge. PBR. Basic shader programming.

Predict to acquire: more in depth knowledge about NPR. Advanced shader programming abilities. More practice on paper implementation .

Tianmu Lan:

Skills: C++ and basic shader implementation.

Predict to acquire: more knowledge about shader implementation and more practice on paper implementation .

REFERENCES

[1] Hyunjun Lee, Sungtae Kwon, and Seungyong Lee. 2006. Real-time pencil rendering. In *Proceedings of the 4th international symposium on Non-photorealistic animation and rendering*. ACM, 37–45.

[2] Santiago E Montesdeoca, Hock Soon Seah, and H-M Rall. 2016. Art-directed watercolor rendered animation. In *Proceedings of the Joint Symposium on Computational Aesthetics and Sketch Based Interfaces and Modeling and Non-Photorealistic Animation and Rendering*. Eurographics Association, 51–58.

[3] Emil Praun, Hugues Hoppe, Matthew Webb, and Adam Finkelstein. 2001. Real-time hatching. In *Proceedings of the 28th annual conference on Computer graphics and interactive techniques*. ACM, 581.