

Victo Ngai Inspired Stylization in Real-Time

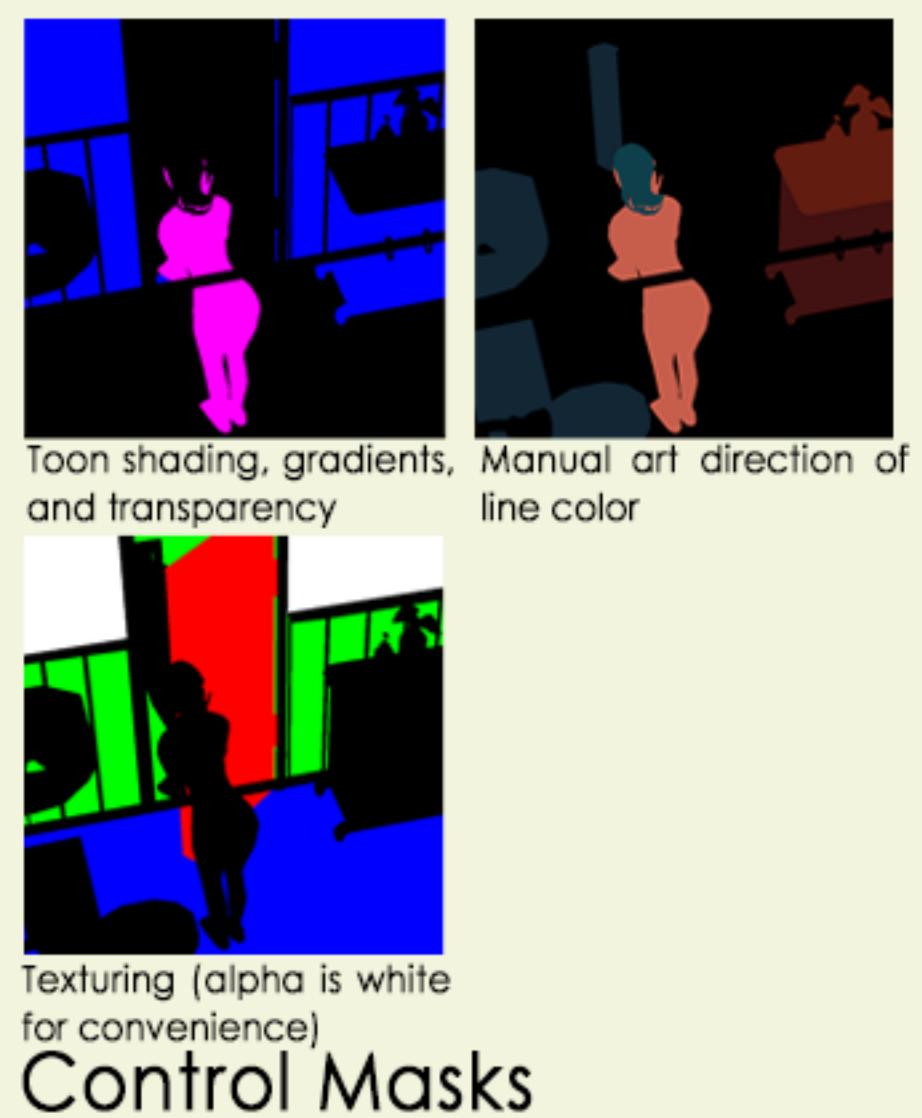
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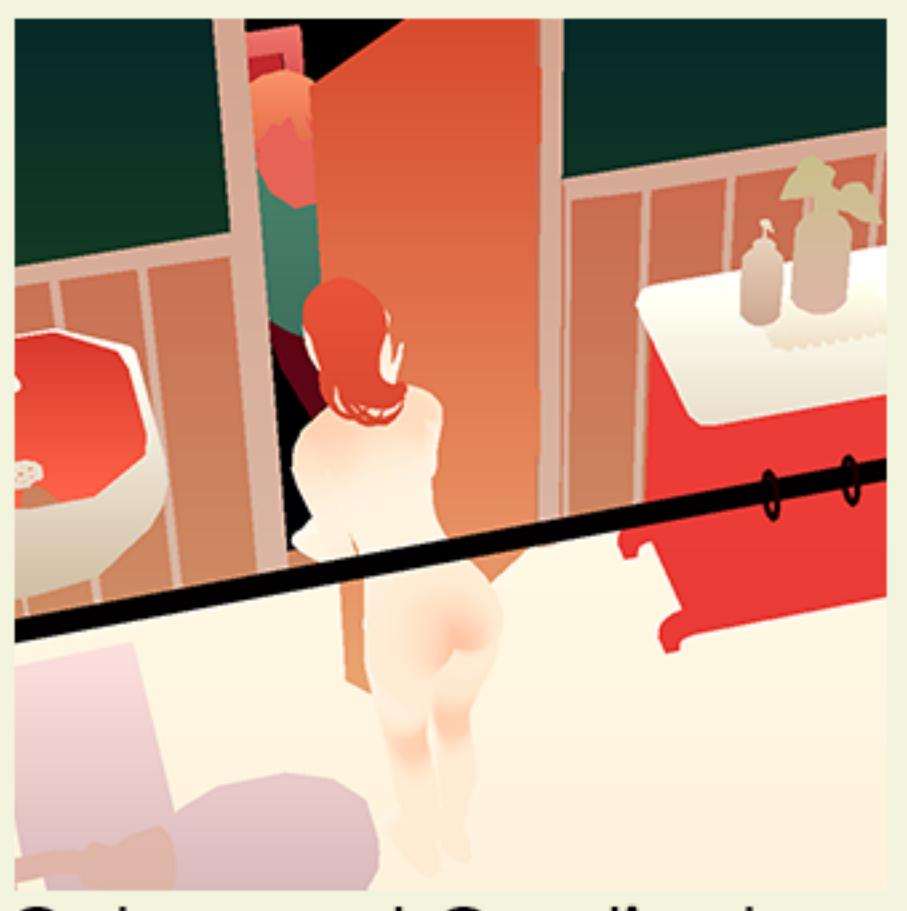
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Stylization Steps



Base Color
This is the scene rendered with Lambertian diffuse shading. Transparent objects are rendered in a later pass.



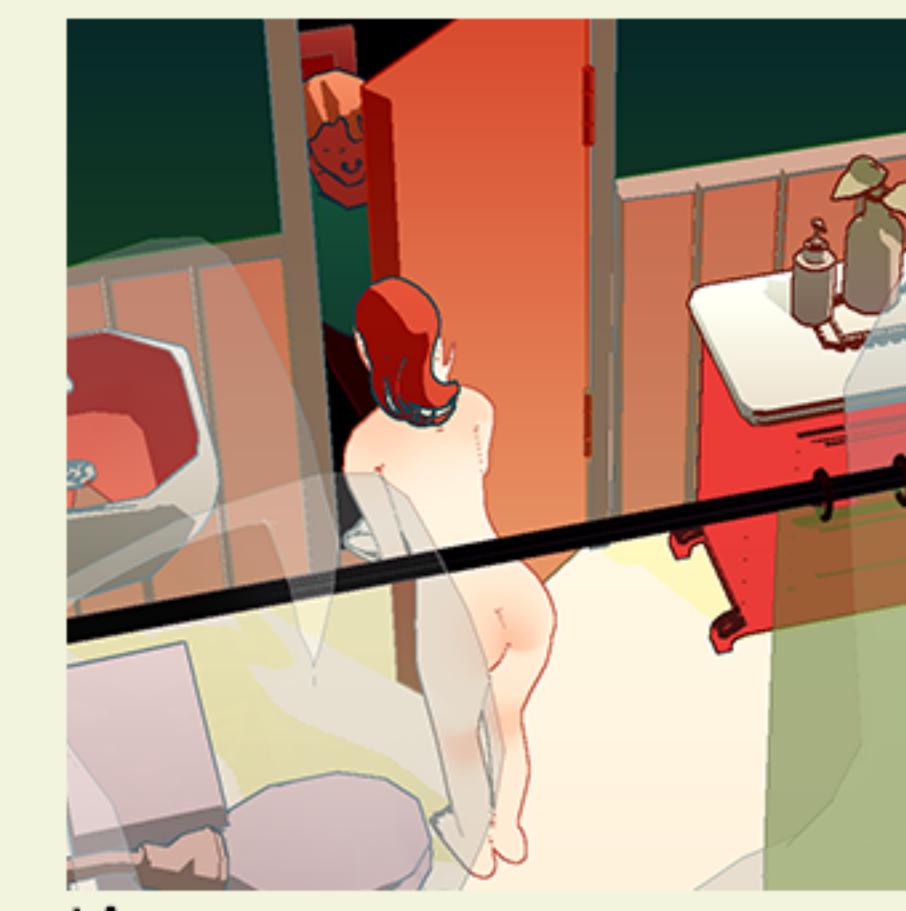
Colors and Gradients
Colors are adjusted using lookup tables. Gradient fitting is done on the basic rendered scene.



Toon and Shadows
Toon shading and shadows also pass through color adjustment and gradient fitting before being added.



Transparency
Transparent objects are sorted and added into the scene. They cast no shadows and have no toon shading, but do contribute to the line drawing.



Lines
Lines are drawn for every object using object IDs, normals, and depth. Color for the lines is chosen using the color of the object and a lookup table.



Textures
Tileable textures and the vignette effect are applied using bilinear interpolation.

Project web page: <https://yixinhe.me/victo.html>

Abstract

Inspired by previous work in real-time watercolor stylization [1], we decided to deconstruct and emulate the bold, gradient-filled work of modern artist Victo Ngai. Through a combination of color adjustment, texturing, and gradient fitting, our system can create a fast approximation of the art of Victo Ngai for use in real-time 3D animation and games.

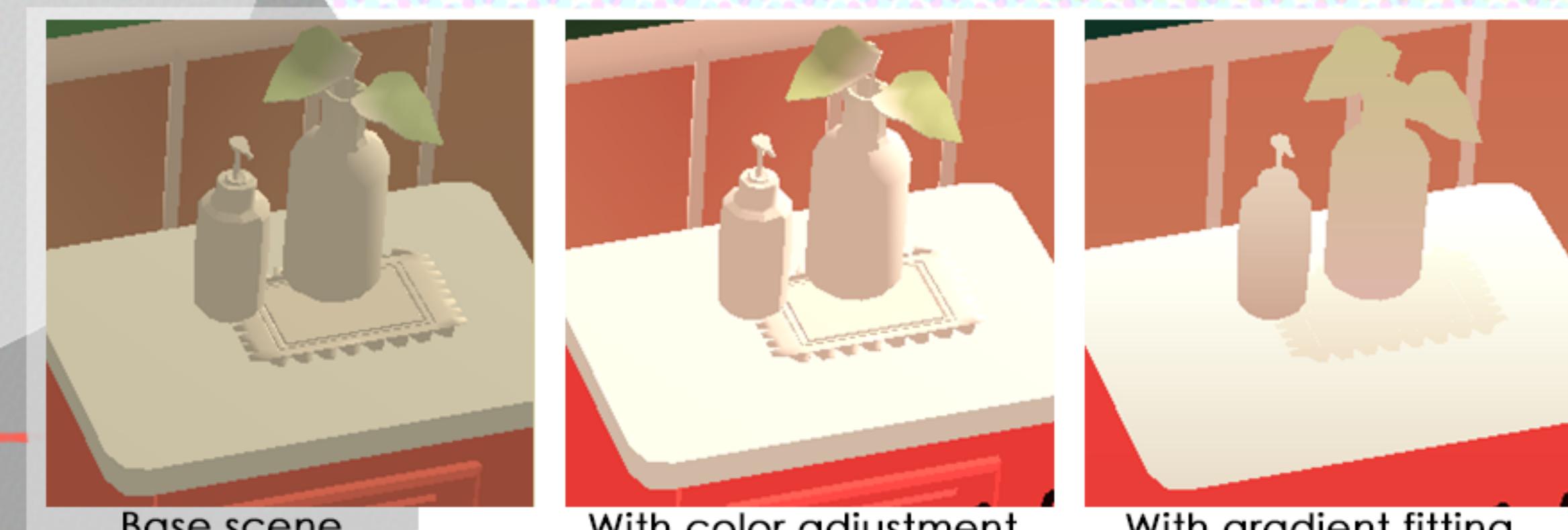
This poster shows the major features of the stylization with overviews of the implementation and a quick look at the steps of the stylization. The scene is based on "Sweet Dreams": <https://victo-ngai.com/nyer>

Source code available

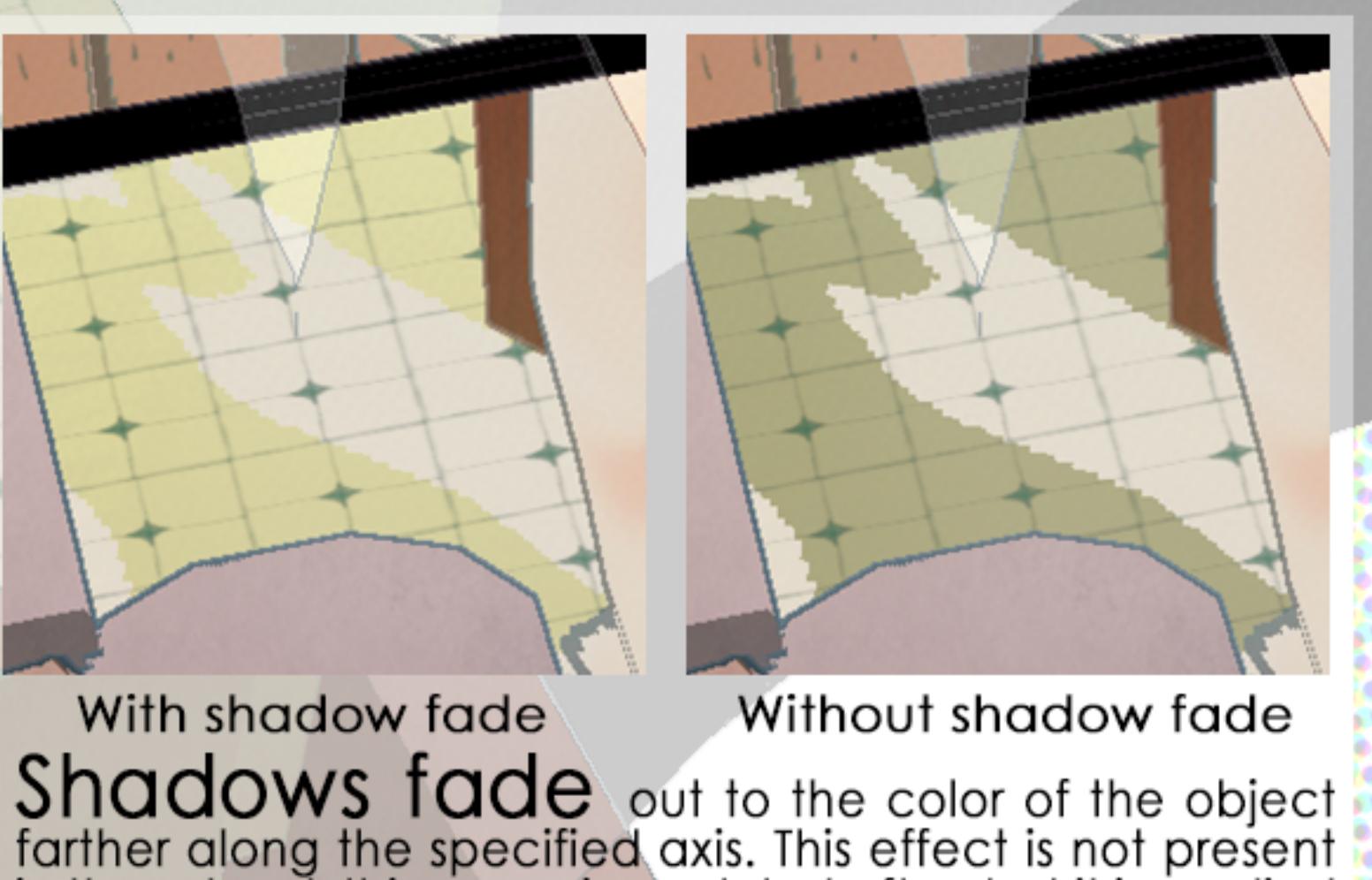
<https://github.com/jackajackalop/Victo-Ngai-ify>

References

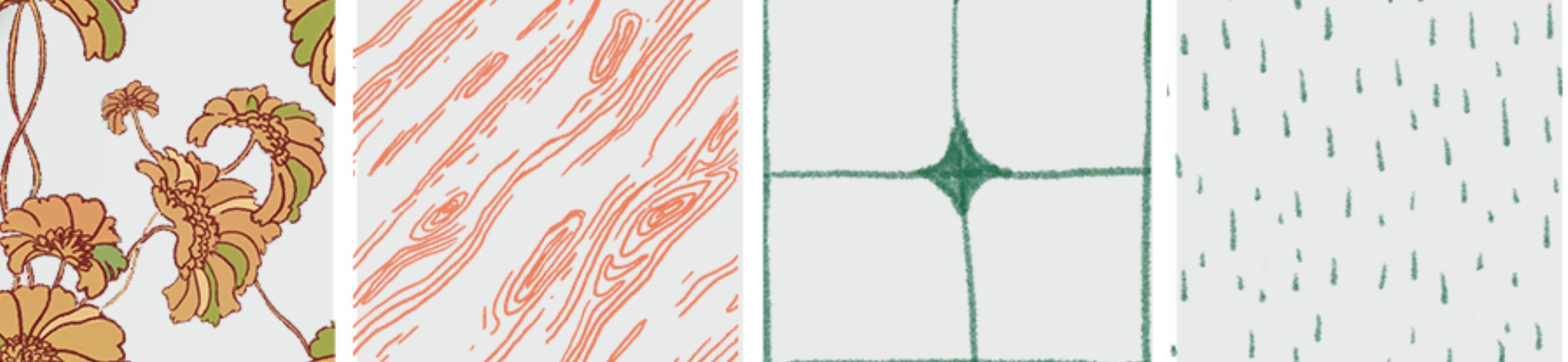
- [1] S.E. Montesdeoca, H.S. Seah, H.-M. Rall, and D. Benvenuti. 2017. Art-directed watercolor stylization of 3D animations in real-time. *Computers & Graphics* 65 (2017).
- [2] E. Praun, H. Hoppe, M. Webb, and A. Finkelstein. 2001. Real-Time Hatching. In Proceedings of the 28th Annual Conference on Computer Graphics and Interactive Techniques (SIGGRAPH '01). Association for Computing Machinery, New York, NY, USA.



Screen tones and similar textures can be found throughout much of Victo Ngai's artworks. This effect is implemented using a tonal art map [2]. Many Victo Ngai artworks also have a vignette effect, so this scene has an additional screentone vignette applied.



Shadows fade out to the color of the object farther along the specified axis. This effect is not present in the artwork this scene is modeled after, but it is applied here to showcase this feature of the stylization.



Detailed hand-drawn textures play a major role in this stylization. Four are used in this scene, and a few more are available in the git repository. All are tileable and can be applied via control masks.