

# Page Curling in WebGL

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Clibe

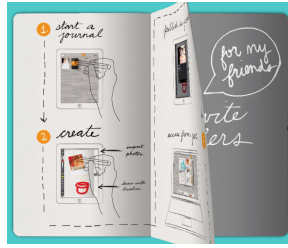


Figure 1: WebGL page turning in Chrome 18 for OS X.

## Abstract

### 1 Introduction

Our application implements the page turning algorithm specified by [Hong et al. 2004] and implemented in OpenGL by [Nuon 2010].

### 2 Implementation

#### 2.1 Page Curling

Page curling is a combination of a parameterized transformation approximating a cone of varying width and position and a rotation about the y-axis.

The shape and position of the cone varies in three phases to simulate the severe curling that occurs at the start, more flat turning in the middle, and finally the wobble of settling onto the resting state. the attributes of the cone are calculated in Javascript then passed to WebGL shaders as uniforms.

The vertex shader calculates its projection onto the cone as a function of its two-dimensional position on the page's plane.

#### 2.2 Two-Sided Textures

A single mesh is used for each page, which has a different texture for each side. To determine the correct texture for a given fragment, a normal vector is passed for each vertex.

Since each page is a parameterized plane, the vertex shader can calculate the position of vertices a small  $\delta$  in either direction.

The normal vector is passed to the fragment shader, which determines if the normal is facing toward or away from the camera and picks the appropriate texture.

### 3 Conclusion

WebGL offers a powerful environment for 3D presentation on the web. While libraries such as three.js can offer significant advantages, implementation can still be challenging.

### References

- HONG, L., CARD, S. K., , AND CHEN, J. J. 2004. Deforming pages of 3d electronic books. *Siggraph'04 Sketches*.
- NUON, W. D., 2010. Implementing ibooks page curling using a conical deformation algorithm. <http://wdnuon.blogspot.com/2010/05/implementing-ibooks-page-curling-using.html>.

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