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E90 Topic Selection Memo

Project Title: Stained Glass

Advisor: Professor Bruce Maxwell

Description: Stained glass is an art form of medieval period that has not been studied extensively by the computer graphics community. PhotoShop [3] has a stained glass filtering functionality, but it does not take the input content into account when determining the tile size. A Stained Glass Image Filter [2] suggests a stained glass filter that segments the input image based on its content, but it fails to create realistic looking images.

I propose to work on creating an algorithm that generates physically accurate and photorealistic stained glass images. I will study the optics of stained glasses and the properties of lead, and implement an algorithm that generates physically realistic stained glass images both from modeled scenes and arbitrary input images. A distributed ray tracer and/or a photon map [1] will be implemented to increase photorealism.

References:

[1] Jensen, H. Efficient Simulation of Light Transport in Scenes with Participating Media Using Photon Maps, *Proceedings of the 25th annual conference on Computer graphics and interactive techniques,* pp. 311-320, July 1998.

[2] Mould, D. A Stained Glass Image Filter, *Proceedings of the 14th Eurographics workshop on Rendering*, pp. 20-25, June 2003.

[3] O'Quinn, D. *Photoshop 6 Shop Manual*. New Rides Publishing, Indianapolis, 2001.