CS348c Project Proposal

Brad Johanson and Brien Oberstein

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1 Overview

We propose to analyze the triangle content of computer graphics scenes. The scenes will come from two categories. The first will be popular 3d computer games available now which take advantage of Direct3D or a similar S3 ViRGE specific toolkit. The second category, which will be primarily for comparison, will be more complex rendered scenes that you see in current research settings. The scenes will be analyzed for a variety of triangle specific data, including triangle size and aspect ratio, among others.

2 Details of Equipment and Programming

S3 Inc has agreed to provide us with one of their ViRGE accellerator boards, several games which utilize it, and a driver which dumps rasterization ready triangles to a text file. They are also providing the source code for the driver so that we can modify what is dumped, or at what time the dump begins and ends. Our main task will be to write programs to collect statistics from the dump files, and possibly to code changes to the driver. We will also need to find appropriate research quality scenes, and write a program to extract the appropriate data from those scenes.

3 Proposed Data to Collect

1. Number of textures per frame
2. Textured pixels(triangles) per frame
3. Histogram of D values (per frame/per sequence)
4. Histogram of W ratios (per frame/per sequence)
5. Histogram of triangle size (per frame/per sequence)
6. Average depth complexit per frame
7. Average texture compression per pixel (How accurate?)

8. Graph of triangles per texture (per frame/per sequence)
9. Graph of pixels per texture (per frame/per sequence)
10. Average number of consecutive hits per texture
11. Histogram of aspect ratios (per frame/per sequence)
12. Histogram of triangles per frame per sequence
13. Average number of pixels above first MIP level per frame (texture magnification)

4 Possible Conclusions and Results

At the end we should have a report which outlines are results. Analysis of the results may also allow us to draw some conclusions on how rasterization might be sped up due to improved triangle ordering based on textures. We also may be able to provide our traces via the Web or FTP so that others have data which they can analyze.