

Final Project Check Off Sheet

Project Title: Real-time Raytracing

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TA Signature/Date:

System Level

Display the rendered image in real-time at 640x480 @ 75 Hz and 1024x768 @ 60Hz using a double buffer

Shader performs object shading using ambient, diffuse, and specular shading models

Master control unit calculates eye rays for each pixel, passes them to raytracing units, and reconstructs frames from the raytracing units.

The raytracer will achieve a frame rate of 20fps, with partial credit for 5fps or 1 fps

Intersector and Ray-tracing Unit (Adam)

State Transition Diagrams, Block Diagrams, and code for Intersector and Raytracing unit.

Intersector detects the closest intersection of a ray with a set of spheres and planes

Raytracing unit receives an eye ray and calculates the color of the eye ray, including reflections.

Fractional Divider and Vector Normalizer (Sam)

State Transition Diagrams, Block Diagrams, and code for Fractional Divider and Vector Normalizer.

Fast fractional divider can divide two 18-bit numbers in less than 7 clock cycles at 85MHz.

Vector normalizer uses Newton's method to do a fast inverse square root for normalization.