

CSCI 1230 Capstone: Real Time Ray Tracing on the GPU

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Abstract

Ray tracing is a technique which can generate artificial images with a high degree of realism by tracing the bounces of individual light rays which emanate from the camera. For this project, we implement ray tracing on the GPU, which allows us to greatly parallelize the ray tracing computations, and render the physics simulation in real time.

The simulation consists of a bunch of marbles which roll around in a bowl. The bowl is represented as a quadratic function, and the balls can bounce off of each other and roll off the bowl. The benefit of rendering the scene using ray tracing is that this allows the balls to realistically reflect and block light. As shown in the image, the bowl and the other marbles are visible in the reflections of each of the marbles,

