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COMS 4995

Topics in Computer Science - Parallel Functional Programming

Professor Edwards

Final Project Proposal

Team

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Project Idea

Physics Particle Simulation

Project Description

One type of application for Haskell Parallel Programming that I have been interested in testing is physical simulations using OpenGL. Parallel rendering deals with applying parallel programming to computer graphics which can help immensely due to the huge amount of resources needed for large scale graphics simulators. I want to build some kind of particle simulation that will support parallel rendering by using parallel programming in computer graphics.

My physics particle simulator will shoot particles/spheres up into the air and will be shaded and rendered onto the program screen. The simulator will allow the user to alter the value for gravity and also change the number of particles. The base run of the program will just continuously fire the particles until the user closes out. The particles will fade, change colors, and simulate a phy It fires particles from the bottom right of the screen over towards the left side. Supports particle fading, pretty colour transitions, and gravity. My project will use a few different graphics libraries such as OpenGL, GLUT, GLUTil, and Data.Colour.

In order to test the performance of the program using multithreading, I will run the program at various `-N<x>` values which allows threads to run in parallelism on a multi-processor or multi-core machine. I will then use ThreadScope to check the performance of the program due to parallelism and determine whether or not the parallel programming led to an increase in performance for the particle simulation.