OpenGL Visualization of the N-Body Problem
CSE 704 Parallel Computing Seminar

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Last semesters projects

- **Andrew** The Lattice Boltzmann Method is an approximation to viscous fluid flow.
- **Suraj** The N-Body Problem is a numerical approximation to the motion of multiple bodies with gravitation.
Work on the Lattice Boltzmann Method was an analysis and reconstruction of a piece of code by Dr. Graham Pullan from Cambridge University, with his permission.

We based our OpenGL visualization on his work as well.
Demonstration of OpenGL visualization for the Lattice Boltzmann Method
LBM Color Map

Velocity

Low

High

Color Map

S. A. Balchand, A. Leach (UB)
NBody Color Map

Mass Density Low High

Color Map

S. A. Balchand, A. Leach (UB)
Comparison of CPU and GPU based computation
Demonstration of OpenGL visualization for the N-Body Problem

http://www.youtube.com/watch?v=LdhTg3X6nmU

- Zoom
- Time interval
- Rmax, Mmax
- Number of bodies
- Color maps


www.ifa.hawaii.edu/ barnes/treecode/treeguide.html
www.scholarpedia.org/article/Nbody_simulations
www.sns.ias.edu/ piet/act/comp/algorithms/starter/index.html
www.amara.com/papers/nbody.html