OpenGL Visualization of the N-Body Problem

CSE 704 Parallel Computing Seminar

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Recap

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.

LBM Code

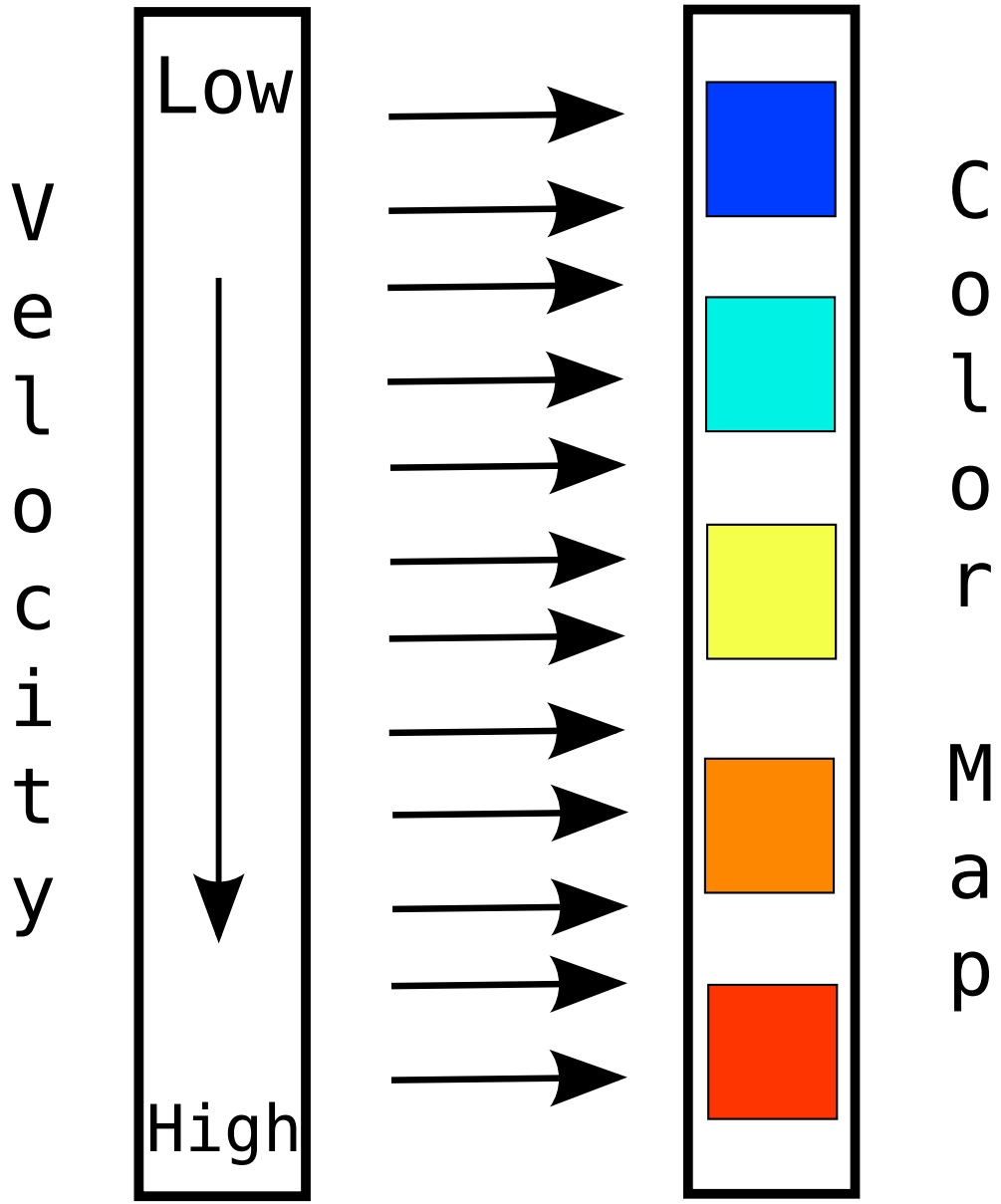
- Work on the Lattice Boltzmann Method was an analysis and reconstruction of a piece of code by Dr.Graham Pullan from Cambridge University, with his permission.

- We based our OpenGL visualization on his work as well.

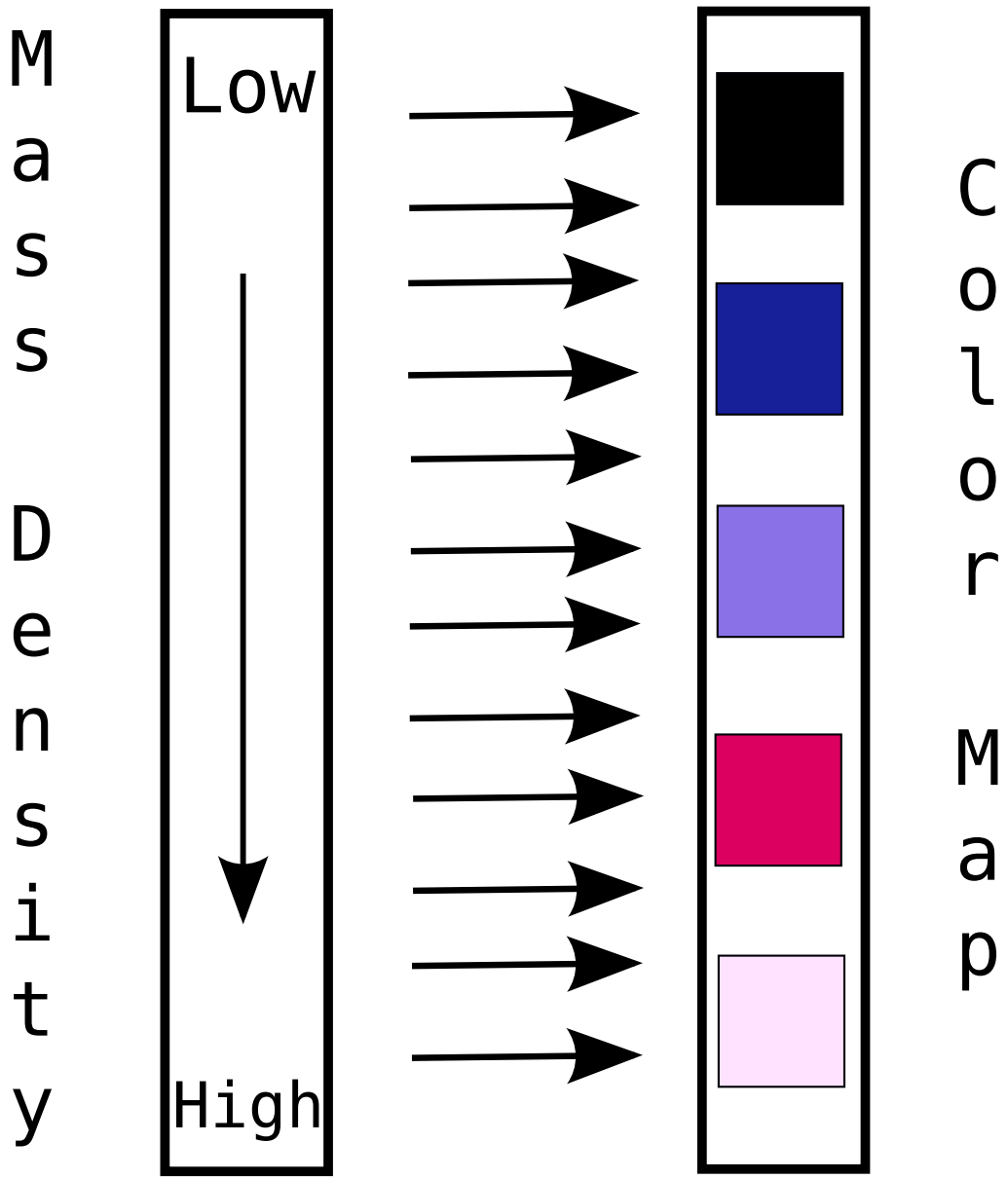
LBM Demo

Demonstration of OpenGL visualization for the Lattice Boltzmann Method

LBM Color Map



NBody Color Map



CPU vs. GPU

Comparison of CPU and GPU based computation

NBody Demo

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

Bibliography


Alexander Wagner, A Practical Introduction to the Lattice Boltzmann Method. North Dakota State University, March 2008.


Graham Pullan, A 2D Lattice Boltzmann Flow Solver Demo. http://www.many-core.group.cam.ac.uk/projects/LBdemo.shtml, University of Cambridge.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