Daily Progress Report

Arkavo Hait, Sagnik Bhattacharya, Aman Deep Singh

June 14, 2016

Summary

Prepared a rough code which would be used in the final program. The Code only applies to one force: gravity However it is still text based but prints the results (position and velocity data) into a text file. It is still a sequential program, but in a form that would be easy to carry over into parallel form.

Detailed Report

May 16, 2016

Created repo on GitHub

May 17, 2016

Created abstract idea for main code

May 25, 2016

Arkavo Hait

Started learning CUDA, from documentation and a tutorial (link in repo).

Sagnik Bhattacharya

Started a course on Udacity on Parallel programming using CUDA. Completed Lesson 1: The GPU programming model.

Aman Deep Singh

Started watching a Video Tutorial series(by David Gohara) focused on OpenCL. Completed 3 Episodes : 'Introduction to OpenCL', 'OpenCL Fundamentals' and 'Building an OpenCL Project'.

May 26, 2016

Arkavo Hait

Continued above tasks. Tried out a simple CUDA program.

Sagnik Bhattacharya

Continued with above Udacity course. Reached Lesson 2: GPU Hardware and Parallel Communication Patterns.

Aman Deep Singh

Continued with the Video Tutorial Series. Moved on to Episode 4:'Memory Layout and Access'

May 27, 2016

Arkavo Hait

Created skeleton code for bodies.

Sagnik Bhattacharya

Made skeleton code Gravity2.c for taking input of planet data.

Aman Deep Singh

Started following an OpenGL tutorial. Tried to make an OpenGL project using CMake but couldn't do it on Ubuntu due to a lot of Errors. Started trying it on Windows. There were many more errors.

May 28, 2016

Arkavo Hait

1. Made a concept skeleton CUDA code for planetary movement.

2. Added code functionality to enable output of data to file (List.txt)

3. Began converting seq.c to sequence.h

Sagnik Bhattacharya

1. Began making a sequential program for N-body simulation, so that that functions created for that program could be used in the CUDA program that will be created.

2. Removed errors in above program. Debugged a segfault, added code to calculate the acceleration of a body given the the positions of the rest of the bodies, and to calculate the position and velocity of each planet after each iteration.

Aman Deep Singh

1. Completed the Video Tutorial Series on OpenCL.

2. Tried to make an OpenGL project using Visual Studio Express 2015 and CMake and faced errors related to missing Header Files.

May 29, 2016

Arkavo Hait

1. Began to make a library to facilitate creation of CUDA code.

2. Made reports.

Sagnik Bhattacharya

Made reports. Did some debugging of skeleton code.

1. Removed error in function addVec, that did not return the vector formed by addition of two given vectors.

2. Removed error in seq.c that stopped the time from updating successfully between iterations.

3. Added code for time stamp to appear with each update of the planetArray.

Aman Deep Singh

1. Learned how to make header files and made a sample header file for basic functions like Addition, Subtraction, Multiplication and Division.

2. Made Reports.

May 30, 2016 to June 13, 2016

Arkavo Hait

Learned more of CUDA, attempted to modify code to run efficiently on GPU, no real progress made due to difficulty in setting up libraries. Created a function library by isolating all functions in the main code that was previously created.

Sagnik Bhattacharya

Created a visualisation by taking data from a text file and plotting it using GNUplot. The initial data was such that 6 'planets' would revolve in circles along a central massive 'sun', and the obtained data showed the same result. After that attempted to install non CUDA languages on Ubuntu, met with several failures. On 13th June finally OpenACC got installed on Ubuntu along with its compiler, and thereafter worked on modifying the code so that it would run efficiently on a GPU. Process not completed yet.

Aman Deep Singh

Attempted to install several non CUDA languages on Ubuntu that support parallel programming, met with repeated failures. Finally installed OpenCL libraries on Windows, and ran a simulation on Windows with three planets that gave correct results. Currently working on visualisation using Matlab, and further optimisation to the code.