Project Title

Student Authors

# Introduction

Explain the problem you want to solve. Example: In this project we will implement a molecular dynamics solver, which calculates atomic forces using energy functions that explicitly handle electrons. The problem is computationally intensive because ...

# Description

Give the details of your algorithm. Example: the program accepts as input a file that describes a 3D point cloud of atoms. It applies 3D FFTs on ….

# Objective and Deliverables

How exactly will you go to solve your problem. Example: we already have an implementation of a parallel version of this solver using threads. This project will parallelize the most computationally-intensive kernels on a GPU. We will identify these kernels by …. These kernels are data parallel, but the memory access patterns are not coalesced. Our strategy to coalesce the access patterns is … By the end of the quarter we will have … Please be as detailed as it is reasonably possible.

# Background

What background do you need to implement this project? Does the team have the necessary background? Example: we will need a deep understanding of Euler Exponential Splines and 3D-FFT. Since the math is separated from the science, we do not need knowledge of quantum mechanics or molecular dynamics. One of the team members is very comfortable with the math involved in this project, while the second team member is an experienced programmer. We list the necessary resources to bring both team members up to speed with the math involved in this work….

# Resources

Do you have access to all the necessary resources? Do you need input sets? If so explain how you will get these sets (and if possible include pointers in the proposal). Are there papers/book chapters that explain the techniques used? If so, list the corresponding references here. Is there an existing code base that you want to port to GPUs? If so, include a pointer to this code base. Etc,…

# Contact Information

Your names and email addresses. If other people not taking this class are involved in this project, please list their names as well (e.g., post-docs, faculty, fellow students in the lab).