

# Measuring and improving energy efficiency of parallel graph algorithms

CSE 613 Parallel Programming, Stony Brook University

## Project Proposal

Aashray Arora & Ajay Lakshminarayanan

Energy efficiency and conservation is a major concern today. There is an enormous energy cost associated with running large scale equipment leading to a huge demand in energy efficient products. Many of the problems faced are related to networked problems and require analyzing them as graph structures. We intend to identify efficient algorithms to analyze these graph structures in an energy efficient way.

Our primary goal is to identify algorithms to find connected components and minimum spanning trees in large graph structures. We intend to parallelize these algorithms and execute them on a given number of cores. We plan to measure the energy consumption when these algorithms are executed on various scales of input. We will display various output statistics and compare these measures. This will be our Plan B.

Our Plan A is to improve the algorithms, which will lead to better energy efficiency when operating on a large scale. We will be using the computing cluster provided by the Extreme Science and Engineering Discovery Environment (XSEDE) for this project.