2015

Parallel Selection Algorithms on GPUs: Implementation and Performance Comparison

Darius Bakunas-Milanowski
Cleveland State University

Parallel Selection Algorithms on GPUs: Implementation and Performance Comparison

Washkewicz College of Engineering

Student Researcher: Darius Bakunas-Milanowski

Faculty Advisor: Janche Sang

Abstract

The computing power of current Graphical Processing Units (GPUs) has increased rapidly over the years. They offer much more computational power than recent CPUs by providing a vast number of simple, data parallel, multithreaded cores. In this project, we focused on the study of different variations of parallel selection algorithms on the current generation of NVIDIA GPUs. That is, given a massively large array of elements, we were interested in how we could use a GPU to efficiently select those elements that meet certain criteria and then store them into a target array for further processing. The optimization techniques used and implementation issues encountered are discussed in detail. Furthermore, the experiment results show that our advanced implementation performs an average of 1.74 times faster than Thrust, an open-source parallel algorithms library.