Experimental Study of Exploiting GPU For Database Query Optimization*

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Abstract

This thesis proposes a model using graphic processor (GPU) cooperation in order to improve database query optimization; Wisconsin bench mark is used for evaluation purposes. Database systems have become one of the most needed tools in digital world. With the extremeness of the computer revolutions, the amount of data had being swelling day by another. Today, the researchers are looking for methods to reduce the execution in order of increasing performance with saving time and energy. Parallel computing is considering one of the good ideas to increase the query execution performance. One of the interesting devices that support parallel computation is *Graphic processing Unit* (GPU). In this study, we will try to find a model that makes a database query be optimized using a GPU. Of course, there is no guarantee that the GPU will process data always quickly, but in some cases and under some circumstances GPU can be a reliable way of optimization. The objective of this research is to answer two questions. First, *when* (in which data size) the GPU can be faster than CPU in executing a database operation? Second, given a query that requires many operations, which operation can be executed on GPU to optimize the query overall? This paper uses Wisconsin benchmark queries and shows practically that GPU can cooperate with CPU to reduce the total execution time.

Keywords:

Database, query optimization, GPGPU, CUDA, selection, sort, group-by, join

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