

ABSTRACT

Many of the problems in the real world is represented in the form of a sparse matrix. Sparse matrix is a matrix that contains many elements zero or store data that does not exist (not required). Processing sparse matrix processing takes longer and requires more memory. This can be overcome by using a sparse matrix storage format. In the sparse matrix storage format, the data that is not negligible, in the sense not processed. Format Compressed Sparse Row (CSR) is one of the most common formats used in the completion of a large sparse matrix. Compressed Sparse Vector (CSV) is another format that is tested. In this study, sparse matrix implemented in CSR and CSV storage format with serial and parallel programs. The efficiency of CSR and CSV storage format than in serial (CPUs) and parallel (using NVIDIA GPU). This study tested based on memory usage and execution time in surgery Sparse Matrix-Vector Multiplication (SpMV). The results of this study are based on the efficiency and speed up the reduction of memory. Parallel storage format CSV indicates speed up by 95% against the serial CSV, 2% against the parallel CSR, and 85% when compared between the serial format. In addition, the reduction of memory generated by 88% of the CSV series and 2% against the parallel CSR, while among the series tied, depending on the data.

Keywords: Large Sparse Matrix, efficiency, CSR, CSV