

ABSTRACT

Parallel computing is needed in computing problems that have high complexity so that it can be done in a short time. Parallel computing requires high-performance hardware and software that is sufficient to execute the algorithm in parallel. One approach to parallel computing is the Graphic Processing Unit (GPU) computing, which in a GPU capable there are many threads in parallel assigned. Brute Force is a problem-solving technique that is very common and can be used to solve computational problems to find the best path. Brute Force works by clicking on enumerating all possibilities existing candidates, resulting in the best solution. In this study, Brute Force with techniques Exhaustive Search will be implemented on the GPU, and the amount threadProcess on every thread and the effect block and threads on the GPU will be analyzed as well.

After some research and statistical tests, it was found that the greater threadProcess changes will result in a decrease in the percentage of time, and adding more threadProcess will cause GPU computing speeds toward a point, because the speed of computation on the GPU device has reached the maximum point. In the experiments conducted, the GPU will surpass the performance of the CPU when the number $maxCity > 10$. Then there is a significant time difference between threadProcess threadProcess 1 and 2 at 41.35%, this is because the GPU device is not used optimally. For the largest percentage decrease in time when using the parallel method is when a user is able to find a combination of thread and block fitting, because increasing the number of threads and blocks do not always guarantee a decrease in the speed of search time, where the search time will reach the converging point.

Keywords: TSP, Brute Force, GPU, CUDA.