

GPU BASED PARALLEL GENETIC ALGORITHM LIBRARY

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The use of Genetic Algorithms (GAs) has grown to widespread acceptance by providing an efficient way to solve complex problems lacking deterministic solution method. GAs employ a special stochastic search method based on evolutionary theory, which gives them the ability to outperform most traditional search methods. Also their use of independent individuals makes them an ideal candidate for parallelization enhancing their inherently good performance even further. Their parallelisability on Graphical Processing Units (GPU) had been shown multiple times, but the implementations were either single objective GAs or just partially accelerated by GPUs, also every time they were experimental designs. The genetic algorithm library discussed in this article is the first that contains fully parallelised GPU implementations of multi-objective genetic algorithms besides the single objective ones. Furthermore, it is organised into a ready to use framework, which provides flexible and efficient GPU accelerated GAs. Thus enabling the user to solve complex problems faster than standard CPU based implementations would allow and with lower overall energy cost.