The global optimization problem -- i.e., the problem of finding global extreme points of given function on restricted domain of values -- often appears in many real-world applications. Improving efficiency of this task can reduce the latency of the application or provide more precise result since the task is usually solved by an approximative algorithm. This thesis focuses on the practical aspects of global optimization algorithms, especially in the domain of algorithmic trading data analysis. Successful implementations of the global optimization solver already exist for CPUs, but they are quite time demanding. The main objective of this thesis is to design a GO solver that utilizes the raw computational power of the GPU devices. Despite the fact that the GPUs have significantly more computational cores than the CPUs, the parallelization of a known serial algorithm is often quite challenging due to the specific execution model and the memory architecture constraints of the existing GPU architectures. Therefore, the thesis will explore multiple approaches to the problem and present their experimental results.