

# [Heuristic fail in the process, are too slow](https://assignbuster.com/heuristic-fail-in-the-process-are-too-slow/)

Heuristic Algorithms or just Heuristics are techniques that are designed to address problemsand to find approximated solutions within reasonable timeframes and with low consumption ofresources.

Often, Heuristic Algorithms are used when traditional approaches, such as determin-istic approaches, fail in the process, are too slow to solve the problem or need a huge amount ofresources in order to calculate a meaningful solution. Unlike traditional approaches, Heuristicsintroduce a certain randomness to the procedure meaning the start of the procedure is randomlyselected. Besides, Heuristics act similar to search algorithms at each step of the procedure basedon available information to determine which path to follow. As mentioned above, Heuristics are procedures for finding approximated solutions to optimiza-tion problems. As Garci? a 11 mentioned, these procedures define unconstrained optimizationas the D-dimensional minimization problem. Perhaps, one of the more remarkable advantages of Heuristics is the limited amount of infor-mation that the algorithm needs to operate. This leverages the flexibility with which the PSOalgorithm can adapt to different scenarios and problems, providing also a wide range of appli-cation.

It is important at this point to emphasize that Heuristics, in almost all cases, output agood result but at a cost. In order to reach the desired solution within a reasonable timeframe, Heuristic Algorithms sac-rifice certain factors such as the accuracy and precision of the results. This allows the algorithmto reach a good solution, very near the optimum. This attribute makes Heuristic Algorithmsvery suitable to solve problems with lack of computation-time and with limited use of memory. Despite this advantages, it is not always possible to use them.

Indeed, some other relevantfactors are ceded, e. g. the optimality and completeness of the results. Besides, the existenceof several results to given problem can cause some complications. On the one side, Heuristicsdo not guarantee that the best solution will be found but only one solution.

Therefore, it is important to know if it is actually necessary to find the best solution. On the other side, thecompleteness of the solution set is not guaranteed, meaning only one solution is going to befound and not all of them. Although some inaccuracies exist in the Heuristic Algorithms’ results, the popularity and in-terest of this methods are increasing since the 70’s. Many studies and developments of newtechniques and improvements regarding Heuristics have been made, e.

g. the work of R. Karp in17, the adaptation made by X. Yang in 35 to improve the results using bats echo system andthe modification made by A. Marandi in 20.