

From the Genetic Algorithms and Global Optimization to Hybrid Optimization

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Nowadays Evolutionary Computations are getting more and more attention as a good tool research tool useful in many different areas of science. The Genetic Algorithms are the particular flavor of EC and are well-suited for solving the problems of optimization, particularly in the cases where the problem is ill-defined, involves many parameters that interact in highly non-linear ways, its hardly feasible to get analytic representation for objective functions, objective functions have many local optima, points at which gradients are undefined, or when the objective function is discontinuous then the optimization of such function poses difficulty for traditional mathematical techniques or in the cases where we don't necessarily need the global optimum, but rather a good fit. The Genetic Algorithm real-valued functions minimization algorithm was implemented in COSY Infinity both as a stand-alone tool and as an complement for the COSY-GO global optimizer. For that purpose the specific type of the genetic operators were used and specific steps were added to the evolutionary process. Those allow the method to work with a collection of boxes in n-dimensional space and co-operate with COSY-GO. Details of the implementation are presented, several examples of the optimization are shown.