

Role of Evolutionary Algorithms in Large-Scale Optimization Problems

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Abstract: Optimization strategies are explained. The general non-linear, constrained optimization problem is provided in standard form, and many strategies for solving it are investigated. Local algorithms are gradient-based, whereas global algorithms are evolutionary or non-gradient-based. Optimization techniques are many, hence a complete examination isn't possible. Instead, engineering optimization approaches are prioritized. The study remains general without including multi-objective optimization, convex problems, linear programming, interdisciplinary optimization, etc. The pros and cons of each solution are highlighted, and suggestions are made to assist the designer pick the best one for the problem. A brief summary of a typical approach is given where possible to aid discussion about that algorithm category.

Keywords: Local algorithms, Gradient-based algorithms, Global algorithms