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The title and abstract :

Multiobjective Optimization: Applications in Computational biology

Abstract

Optimization problems are ubiquitous, finding applications in numerous real-life situations. Multi-objective optimization problems (MOPs) are ones that require simultaneous optimization of multiple conflicting objectives such that improving solutions in terms of one objective leads to deterioration in terms of one or more of the other objectives. In MOPs, the target is to arrive at the best trade-off surface, called the Pareto optimal front.

Computational Biology deals with the development and use of computational methods for biological applications. Many such applications involve optimization of more than one objective which conflict with each other. Multiobjective optimization techniques therefore find wide applications in computational biology.

In this talk, we will first provide a brief introduction to MOPs and discuss some metaheuristics for solving them. A brief introduction to computational biology, including the central dogma of molecular biology, will be presented. This will be followed by descriptions of two computational biology tasks, namely, drug design and gene expression data clustering, both of which require the application of multiobjective optimization approaches. The talk will conclude with a mention of a recent development in MOPs, namely multi-modal MOPs.