An Efficient Batch Expensive Multi-objective Evolutionary Algorithm based on Decomposition

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ABSTRACT

This talk proposes a novel surrogate-model-based multi-objective evolutionary algorithm, which is called Multi-objective Bayesian Optimization Algorithm based on Decomposition (MOBO/D). In this algorithm, a multi-objective problem is decomposed into several subproblems which will be solved simultaneously. MOBO/D builds Gaussian process model for each objective to learn the optimization surface, and defines utility function for each subproblem to guide the searching process. At each generation, MOEA/D algorithm is called to locate a set of candidate solutions which maximize all utility functions respectively, and a subset of those candidate solutions is selected for parallel batch evaluation. Experimental study on different test instances validates that MOBO/D can efficiently solve expensive multi-objective problems in parallel. The performance of MOBO/D is also better than several classical expensive optimization methods.

This paper will be presented at the IEEE Congress on Evolutionary Computation 2017 (CEC 2017), June 5-8, San Sebastián, Spain

Supervisors: Prof Qingfu Zhang, Prof Sam Kwong

Research interests: Multiobjective Optimization; Computational Intelligence; Machine Learning

All are welcome!