

FINDING LOCAL OPTIMA FOR COSTLY OBJECTIVE FUNCTIONS (USING RADIAL BASIS FUNCTIONS)

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Abstract

The present work deals with optimization of costly objective functions. The paper objective is to minimize a function $f(x)$ which is costly to evaluate. In this context costly means time consuming, and one single function evaluation could require several hours of computation time. We assume that neither analytical expression of $f(x)$ can be found, nor can we find derivatives. Such functions are often referred to as “**black-box**”. One way of dealing with such optimization problems is to sample the variable space and build surrogate models based on Radial Basis function (**RBF**), which are sufficient to predict the output of an expensive computer code. In this paper we discuss two different iterative methods that are often used in optimization to find the approximate local optima to black box function. Thereafter we show that surrogate models based on RBF contribute more and more accurately to the problem in terms of time than the two analytic methods.

Keywords: Radial Basis Functions, local optima, black-box, Costly objective functions.