

Zooming in Surrogate Optimization Using Convolute RBF

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Abstract

There are a lot of efficient methods in surrogate optimization. Convolute RBF is the one of them, and we have examined its effectiveness for years. However, in most case, if the number of design variables raise and/or the searching range extended, they have some problems in approximating functions both in local accuracy and global trends. They have the same reason of sparseness of given data with respect to its searching range, and which happens by the nature of large scale optimization. In this study, zooming technique in approximation is proposed. When we have a certain amount of data, we can divide given datum into some parts and restrict its searching range to some small area. Then in each part, we can achieve more accuracy for local approximation. Moreover, if we can restrict searching range smaller, we have more possibilities to achieve global solution within given searching range. Besides, we can have local optima for each part, which can be candidates for true global solution in the future. In this paper, we examined effectiveness of the method through numerical example.

Keywords: surrogate optimization; convolute RBF; data distribution;