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عنوان مقاله:

A Solution for Sparse PDE-Constrained Optimization by the Partition of Unity and RBFs

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خلاصه مقاله:

In this paper, we propose a radial basis function partition of unity (RBF-PU) method to solve sparce optimal control problem governed by the elliptic equation. The objective function, in addition to the usual quadratic expressions, also includes an L1-norm of the control function to compute its spatio sparsity. Meshless methods based on RBF approximation are widely used for solving PDE problems but PDE-constrained optimization problems have been barely solved by RBF methods. RBF methods have the benefits of being versatile in terms of geometry, simple to use in higher dimensions, and also having the ability to give spectral convergence. In spite of these advantages, when globally RBF collocation methods are used, the interpolation matrix becomes dens and computational costs grow with increasing size of data set. Thus, for overcome on these problemes RBF-PU method will be proposed. RBF -PU methods reduce the computational effort. The aim of this paper is to solve the first-order optimality conditions related to original problem.

کلمات کلیدی:

Sparse, Optimal control, Radial basis functions, Partition of unity

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