

Improved Whale Algorithm Based on Information Entropy and Its Application in Truss Structure Optimization Design

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Abstract : Given the limitations of the original whale optimization algorithm (WAO) in local optimum and low convergence accuracy in truss structure optimization problems, based on the fundamental whale algorithm, an improved whale optimization algorithm (SWAO) based on information entropy is proposed. The information entropy itself is an uncertain measure. It is used to control the range of whale searches in path selection. It can overcome the shortcomings of the basic whale optimization algorithm (WAO) and can improve the global convergence speed of the algorithm. Taking truss structure as the optimization research object, the mathematical model of truss structure optimization is established; the cross-sectional area of truss is taken as the design variable; the objective function is the weight of truss structure; and an improved whale optimization algorithm (SWAO) is used for optimization design, which provides a new idea and means for its application in large and complex engineering structure optimization design.

Keywords : information entropy, structural optimization, truss structure, whale algorithm

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