

عنوان مقاله:

SYMBIOTIC ORGANISMS SEARCH AND HARMONY SEARCH ALGORITHMS FOR DISCRETE OPTIMIZATION OF STRUCTURES

محل انتشار:

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خلاصه مقاله:

In this work, a new hybrid Symbiotic Organisms Search (SOS) algorithm introduced to design and optimize spatial and planar structures under structural constraints. The SOS algorithm is inspired by the interactive behavior between organisms to propagate in nature. But one of the disadvantages of the SOS algorithm is that due to its vast search space and a large number of organisms, it may trap in a local optimum. To fix this problem Harmony search (HS) algorithm, which has a high exploration and high exploitation, is applied as a complement to the SOS algorithm. The weight of the structures' elements is the objective function which minimized under displacement and stress constraints using finite element analysis. To prove the high capabilities of the new algorithm several spatial and planar benchmark truss structures, designed and optimized and the results have been compared with those of other researchers. The results show that the new algorithm has performed better in both exploitation and exploration than other meta-heuristic and mathematics methods.

کلمات کلیدی:

discrete variables, symbiotic organisms search, harmony search, size optimization, structural optimization, truss structures, meta-heuristic algorithm.

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