

Pressure Vessel Design Simulation Using Hybrid Harmony Search Algorithm

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Abstract:

Recently the development of optimization algorithm is rapidly increased. Among several optimization algorithms, Harmony Search (HS) has been recently proposed for solving engineering optimization problems. The HS has some weaknesses such as parameters selection and falling in local optima. Many variants proposed to solve these problems. This paper presents successful hybrid algorithms with high performance to solve the pressure vessel design simulation. The hybrid algorithms consist of well-known variants of HS and an opposition-based learning technique. The hybrid algorithm improved the HS exploration and avoiding falling in local optima, which lead the algorithm to provide significant results.

Keywords: Harmony Search (HS); Optimization Problems; Hybrid Algorithms

References

1. Alaa A. Alomoush, A.A.A., et al., Hybrid Harmony Search Algorithm with Grey Wolf Optimizer and Modified Opposition-based Learning. IEEE Access, 2019: p. 1--3.
2. Sörensen, K., Metaheuristics--the metaphor exposed. International Transactions in Operational Research, 2015. 22(1): p. 3--18.
3. Sörensen, K. and F.W. Glover, Metaheuristics. Encyclopedia of operations research and management science, 2013: p. 960--970.
4. Salih, S.Q., A.A. Alsewari, and Z.M. Yaseen. Pressure Vessel Design Simulation: Implementing of Multi-Swarm Particle Swarm Optimization. in Proceedings of the 2019 8th International Conference on Software and Computer Applications. 2019. ACM.
5. Chiong, R., Nature-inspired algorithms for optimisation. Vol. 193. 2009: Springer.