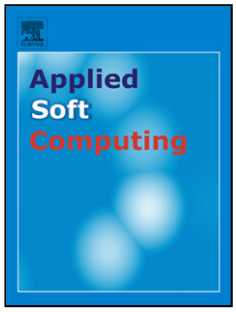

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Author: Nirmala Sharma Harish Sharma Ajay Sharma

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Beer froth artificial bee colony algorithm for job-shop scheduling problem

Nirmala Sharma, Harish Sharma

Rajasthan Technical University, Kota, Rajasthan, India

Ajay Sharma

Government Engineering College Jhalawar, Rajasthan, India

Abstract

Job-shop scheduling problem ($JSSP$) is a vital combinatorial optimization problem in the field of machine scheduling. The high complexity of $JSSP$ is attracting researchers since the past few decades and many swarm intelligence (SI) based algorithms have been presented to solve it. Artificial bee colony algorithm (ABC) has been proven to be an efficient technique in the field of SI based algorithms. ABC algorithm is attracting researchers because of its performance available in literature in the area of solving real-world optimization problems. This article presents a modified ABC algorithm to solve $JSSP$. Here, in the onlooker bee phase of ABC, to maintain a proper harmony amid exploration and exploitation capabilities, beer froth phenomenon inspired position update is incorporated. The proposed strategy is named as Beer froth artificial bee colony algorithm ($BeFABC$). The $BeFABC$ has been assessed on 25 benchmark test problems and compared with other state-of-art algorithms. Further, it is applied to solve 62 well-known instances of discrete $JSSP$. The obtained numerical results and statistical analysis depict that the proposed algorithm is competent in dealing with the discrete real-world $JSSP$.

Keywords: Job shop scheduling problem, Beer froth, Swarm intelligence, Artificial bee colony

Email addresses: nsharma@rtu.ac.in (Nirmala Sharma), hsharma@rtu.ac.in (Harish Sharma), ajay_2406@yahoo.com (Ajay Sharma)