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Elephant Herding Optimization for Service Selection in QoS-Aware Web Service Composition

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Abstract : Web service composition combines available services to provide new functionality. Given the number of available services with similar functionalities and different non functional aspects (QoS), the problem of finding a QoS-optimal web service composition is considered as an optimization problem belonging to NP-hard class. Thus, an optimal solution cannot be found by exact algorithms within a reasonable time. In this paper, a meta-heuristic bio-inspired is presented to address the QoS aware web service composition; it is based on Elephant Herding Optimization (EHO) algorithm, which is inspired by the herding behavior of elephant group. EHO is characterized by a process of dividing and combining the population to sub populations (clan); this process allows the exchange of information between local searches to move toward a global optimum. However, with Applying others evolutionary algorithms the problem of early stagnancy in a local optimum cannot be avoided. Compared with PSO, the results of experimental evaluation show that our proposition significantly outperforms the existing algorithm with better performance of the fitness value and a fast convergence.

Keywords : bio-inspired algorithms, elephant herding optimization, QoS optimization, web service composition
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