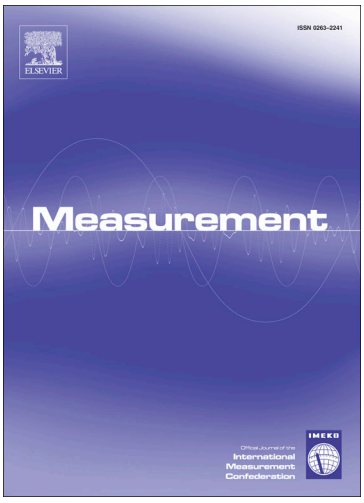

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ABSTRACT

Evolutionary optimization algorithms by imitating survival of the best features and transmutation of the creatures within their generation, approach complicated engineering problems very well. Similar to many other field of research, civil engineering problems have benefited from this capacity. In the current study, optimum design of retaining walls under seismic loading case is analyzed by three evolutionary algorithms, differential evolution (DE), evolutionary strategy (ES), and biogeography-based optimization algorithms (BBO). All the results are benchmarked with the classical evolutionary algorithm, genetic algorithm (GA). To this end, two different measures, minimum-cost and minimum-weight, are considered based on ACI 318-05 requirements coupled with geotechnical considerations for retaining walls. Numerical simulations on three case studies revealed that BBO reached the best results over all the case studies decisively.

KEYWORD

Retaining wall; Pseudo-static loading case; Global optimization; Evolutionary Algorithms.