A New Stochastic Global Optimization Algorithm Based on Random Search Technique and Application to Limit Load of Dome Trusses

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**Abstract.** The article proposes a new algorithm for global optimization based on a stochastic search technique. The advantage of the proposed algorithm is that after each iteration, the search space is gradually narrowed to the global optimum; as a result, the algorithm automatically converges to the global optimum. This algorithm is easy to implement and can be applied to many problems with great flexibility. It used twenty-three well-known test functions in the first example, and the obtained results are compared with the results of the other methods to demonstrate the effectiveness and reliability of the proposed algorithm. In this research, it is proposed for the first time the objective function is the limit load of dome trusses, and the variables are the amount of length adjustment. The critical load is increased approximately three times after optimization.

**Keywords**: Stochastic Global Optimization Algorithm, Random Search Technique, Global optimum, Limit load, Dome Truss.