عنوان مقاله:

Buckling optimization of variable stiffness cylindrical shell with and without cutouts through artificial intelligence and genetic algorithm

محل انتشار:

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خلاصه مقاله:

One of the important issues in the aerospace industry is improving the performance of existing structures. For doing so, researchers need to investigate the behavior of these structures, using finite element methods (FEM). Still, the main problem is that these analyses have a very high computational time. One of the best ways to deal with this issue and reduce computational time is to use artificial intelligence techniques. In this research, a new framework is proposed to predict the behavior of structures and replace the finite element method to reduce the computational time and obtain the best existing structure in the shortest possible time using the genetic algorithm. The proposed method improved the buckling load of variable stiffness composite cylinders with and without cutouts. This was done by changing the fiber angles in the direction of the cylinder. The results were obtained by increasing the buckling load of the composite cylinder without cutouts by five percent and the composite cylinder with cutouts by twenty percent .compared to the quasi-isotropic models. Also, the computational cost dramatically reduced

کلمات کلیدی:

Variable stiffness; Cylindrical shell; Buckling; Artificial neural network; Genetic algorithm