

عنوان مقاله:

Crack Detection in Functionally Graded Beams using Conjugate Gradient Method

محل انتشار:

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خلاصه مقاله:

In this paper, the conjugate gradient (CG) method is employed for identifying the parameters of crack in a functionally graded beam from natural frequency measurement. The crack is modeled as a massless rotational spring with sectional flexibility. Using the Euler-Bernoulli beam theory on two separate beams and applying the compatibility requirements of the crack, the characteristic equation can be obtained as a function of natural frequency and location and depth of crack. In direct problem, the natural frequency is computed using analytical analysis. Moreover, the location and depth of crack are determined by measuring the three natural frequencies of beam in inverse problem. In this study, the CG method is utilized in inverse problem to determine the location and depth of crack. The obtained results show the efficiency of CG algorithm in terms of accuracy and the convergence speed.

کلمات کلیدی:

Functionally Graded Beam, Crack Detection, Conjugate Gradient Method

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