عنوان مقاله:

Behavior evaluation of steel cantilever beams based on DICtechnique and improved hybrid PSO algorithm

محل انتشار:

سیزدهمین کنگره بین المللی مهندسی عمران (سال: 1402)

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خلاصه مقاله:

In this paper, using the Finite Element Model Updating (FEMU) of a steelcantilever beam, the support conditions of a partially fixed connection and thebehavior of the beam are investigated. The FEMU, as an appropriate techniquefor Structural Health Monitoring (SHM), has been utilized in the past based ondata extracted from discrete sensors. In this research, the information related todisplacement and strain is continuously measured on the beam surface using theDigital Image Correlation (DIC) method. The difference between the initialmodel and the DIC measurements is determined by a cost function. A hybridmethod called Powell Particle Swarm Optimization (PPSO) is used to minimizethe cost function. This method includes Particle Swarm Optimization (PSO) asa global search technique and Powell optimization as a local search technique.A dynamic inertia weight is presented to improve the performance of the PSOalgorithm. Finally, the dependency of beam behavior on each of the variables isinvestigated. This method yields acceptable convergence of the results and canbe extended to study other structural components.

کلمات کلیدی:

Finite element model updating, Structural health monitoring,Digital image correlation, Particle swarm optimization.

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