

عنوان مقاله:

An adaptive-network-based fuzzy inference system (ANFIS) for prediction of characteristics in the Mechanics of Composite Materials

محل انتشار:

اولین کنفرانس بین المللی مکانیک، ساخت، صنایع و مهندسی عمران (سال: 1398)

تعداد صفحات اصل مقاله: 6

نویسنده:

Hadi Mehdipour - *Department of Mechanical Engineering, Faculty of Shahid Chamran, Kerman Branch, Technical and Vocational University (TVU), Kerman, Iran*

خلاصه مقاله:

Lack of actual amount of principal factors in the composite materials filed results in imprecision and uncertainty. Use of different approaches for analyzing and solving the engineering problems depends on nature and amount of uncertainty of problems. When the information of the system is characterized through linguistic terms in such situations, the fuzzy theory can be used to determine the structural response in the sense of evaluation of its upper and lower bounds, respectively. We can obtain a more strong fuzzy system by combining neural network techniques and fuzzy logic called Adaptive Fuzzy Systems (AFS). In this article, we propose a new neuro-fuzzy technique for the composite materials, in order to find an optimal volume fraction when Hooke's law is utilized in a unidirectional lamina. We devised an Adaptive Network-based Fuzzy Inference System (ANFIS) as an estimator system for composite materials science. To construct a neuro-fuzzy system has utilized a Takagi-Sugeno-Kang type fuzzy system. We show that the ANFIS is more accurate rather than a rule of mixture theory in the estimation of empirical data especially in uncertain situations. In order to evaluate the proposed approach, we perform experiments on a dataset of empirical data through MATLAB software. We compared the ability of the proposed approach with the rule of mixtures approach and illustrated that ANFIS is more accurate to estimate the empirical data.

کلمات کلیدی:

Composite materials; ANFIS; Fuzzy logic; rule of mixture

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1006904>

