

عنوان مقاله:

Evaluation of Neural Network Performance in Concrete Properties Estimation

محل انتشار:

ششمین کنفرانس بین المللی مهندسی عمران (سال: 1382)

تعداد صفحات اصل مقاله: 8

نویسندگان:

Ali A. Ramezani pour - Amirkabir University of Technology, Tehran, Iran

A. Davarpanah - Engineering Department, Islamic Azad University, Mashhad, Iran

خلاصه مقاله:

Appropriate concrete mix issue with respect to construction requirement (workability) and design necessities (strength and durability) is converted to a complicated, difficult and time consuming problem due to variation in the quality and quantity of concrete constituents and construction practices. The extensive application of admixtures and additives in concrete to improve its properties, construction constraints and even the economical aspects of concrete mixes have made this problem more complicated. Nowadays, neural networks applications extend in engineering field due to their advantages as a public solution in generation and classification. In generation problem, neural network as a free model can approximate nonlinear and complex relation due to concrete mix design nature and trial and error process by learning real record relationship with no assumption. The results of the study show the ability of neural networks for concrete mix proportioning. Two types of neural networks ie. multi-layer perceptron (MLP) as a feed forward neural network and generalized regression neural network (GRNN) as a radial basis network which is used for generation and function approximation were applied, throughout this study. An optimization model subject to construction and design requirements as constraints and material cost as the goal function proportioning concrete mix was designed. In the other words, concrete mix design based on cost minimization is introduced. Experimental records from 145 different concrete mixes of Tehran Communication Tower (420 m high tower under construction) containing four different admixtures and silica fume were used as data input

کلمات کلیدی:

Concrete Properties, Modeling, Free Model, Mix Design, Estimation, Generation, Optimization, Neural Networks, Nonlinear Programming

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