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FLY ASH CONCRETE WITH FIBERS: COMPARISON OF TENSILE STRENGTH USING NEURAL NETWORK AND DESIGN OF EXPERIMENTS METHODS

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Abstract

Neural networks are a series of simple mathematical models, created on the architecture of human brain which gives a superior capacity of learning based on numerous connections established among neurons. The artificial neural networks have strong units of processing which are characterized by an extreme simplicity, but because of their whole interaction, the results are complex. The paper presents the comparison of two methods: mathematical regression and artificial neural network, used for predicting the tensile properties for fly ash cement concrete with fibers. The experimental tests were conducted on 13 mixes obtained on the basis of the central composite design of experiment. The artificial neural network presented a better approximation. The Design of Experiments is a systematic, rigorous approach to engineering problem-solving that applies principles and techniques in the data collection, in order to determine simultaneously the individual and interactive effects of many factors that could affect the output results in any design.

Key words: artificial neural networks, cement concrete, design of experiments, fly ash

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