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Evaluating the Compressive Strength of Concrete Exposed to Elevated Temperatures Using Ultrasonic Pulse Velocity and Artificial Neural Networks

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The objective of this study is to construct artificial neural networks for evaluating the compressive strength of concrete subjected to elevated temperature by using ultrasonic pulse velocity technique. The experiments were performed with different mixture proportions of concrete at temperature ranging from 200 to 800 degrees Celsius. For each test, the ultrasonic pulse velocity and compressive strength were measured. The multi-layer feed-forward neural network was used in this study. The input features to the neural networks were ultrasonic pulse velocity, feature extraction of ultrasonic waveform and mix parameters of concrete. Based on the experimental results, the proposed neural network was successfully used in modeling the ultrasonic pulse velocity and compressive strength relationship. Therefore, the proposed neural network can be utilized for predicting the compressive strength of concrete exposed to elevated temperatures.

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Ключевые слова:

Содержание

- Abstract
- Introduction
- Experimental procedure
- Experimental results
- Conclusions
- Acknowledgement