類神經網路與經驗公式在高性能混凝土抗壓強度預測之比較

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摘要

Because the proportions of high-performance concrete (HPC) are more complex than those of conventional concrete, the difficulty of prediction of strength has been increased, and an accurate model cannot be induced using regression analysis. An artificial neural network has the ability of building a highly accurate predictive model; therefore, this study used this technique and a large experimental data set to build a model of HPC strength. Also, using the same experimental data set, this study employed nonlinear regression analysis to determine the coefficients of three experimental equations of strength of concrete, and compared their results with those of artificial neural networks. Finally, using experiments of compressive strength, it was proved that the artificial neural networks can build a much more accurate model than nonlinear regression analysis for the prediction of strength of HPC.

關鍵字：high-performance concrete, compressive strength, prediction, artificial neural networks, experimental formulae.