

Simulation of concrete slump using neural networks

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Abstract

In this study, an artificial neural network-based modeling system was established to explore the feasibility of predicting the slump of concrete. Computational simulation of concrete slump was performed using the trained neural network. The variation in concrete slump was achieved by varying combinations of factors like the water/binder ratio (w/b), superplasticizer-binder ratio (SP/B), and water content. From the water content-slump curves generated using the trained neural networks developed in this study, two sets of curves have been produced to explore the effects of w/b and SP/B. It has found that (1) the use of neural network for the modeling of concrete slump looks very promising, (2) although the water content and SP/B ratio were kept constant, a change in w/b ratio had a distinct effect on the consistence properties, (3) a certain saturation level for the SP exists, above which only a small effect of further dispersion is obtained, and (4) a certain saturation level for the water content exists, above which only a small effect, even negative effect, on slump is obtained.

Keyword : superplasticizer, slump, consistence, artificial neural networks.