Modeling slump flow of concrete using second-order regressions and artificial neural networks

葉怡成

Information Management

Computer Science and Informatics

icyeh@chu.edu.tw

Abstract

High-performance concrete (HPC) is a highly complex material, which makes modeling its behavior a very difficult task. Several studies have independently shown that the slump flow of HPC is not only determined by the water content and maximum size of coarse aggregate, but that is also influenced by the contents of other concrete ingredients. In this paper, the methods for modeling workability of concrete using second-order regression and artificial neural network (ANN) are described. This study led to the following conclusions: (1) A slump flow model based on ANN is more accurate than that based on regression analysis. (2) It becomes convenient and easy to use ANN models for numerical experiments to review the effects of the proportions of each variable on the concrete mix.

Keyword：concrete, workability, modeling, artificial neural network, regression.