Prediction Compressive Strength of Self-Compacting Concrete Containing Fly Ash Using Fuzzy Logic Inference System

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Abstract : Self-compacting concrete (SCC) developed in Japan in the late 80s has enabled the construction industry to reduce demand on the resources, improve the work condition and also reduce the impact of environment by elimination of the need for compaction. Fuzzy logic (FL) approaches has recently been used to model some of the human activities in many areas of civil engineering applications. Especially from these systems in the model experimental studies, very good results have been obtained. In the present study, a model for predicting compressive strength of SCC containing various proportions of fly ash, as partial replacement of cement has been developed by using Adaptive Neuro-Fuzzy Inference System (ANFIS). For the purpose of building this model, a database of experimental data were gathered from the literature and used for training and testing the model. The used data as the inputs of fuzzy logic models are arranged in a format of five parameters that cover the total binder content, fly ash replacement percentage, water content, super plasticizer and age of specimens. The training and testing results in the fuzzy logic model have shown a strong potential for predicting the compressive strength of SCC containing fly ash in the considered range.
Keywords : self-compacting concrete, fly ash, strength prediction, fuzzy logic
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