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ARTICLE

Multifunctional computational models to predict the long-term compressive strength of concrete incorporated with waste steel slag

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Abstract

To preserve the environment and natural resources, steel slag recovery conserves natural resources and makes landfill space available. Steel slag as a waste material has been partially substituted for fine (sand) and coarse aggregate in concrete (gravel). Compressive strength (CS) is the most significant mechanical attribute for all forms of concrete composites. To save time, energy, and money, it is essential to create accurate models for forecasting the CS of normal concrete (NC). In addition, it offers essential information for organizing the building work and details the ideal time to remove the formwork. In total, 338 data points were gathered, processed, and modeled in total. During the modeling approach, the most influential elements impacting the compressive strength (CS) of concrete with steel slag replacement were addressed. According to the modeling method, the most effective parameter which affects the compressive strength of normal concrete is the curing time. This research employed a Multi Logistic Regression model (MLR), an Artificial Neural Network (ANN), a Full Quadratic model (FQ), an M5P-tree model, and an Interaction model to predict the compressive strength of normal strength