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Editorial

Numerical Study of Concrete

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This Special Issue, "Numerical Study of Concrete", consists of 22 research articles.

Wang et al. [1] developed a finite element model for the numerical simulation of a hybrid-fiber-reinforced concrete (HFRC) shaft lining structure. The numerical results indicate that the maximum hoop stress position of the HFRC shaft lining presents a transition trend from the inside surface to the outside surface; the hoop strain of shaft lining concrete is always compressive, and the inside surface is greater than the outside surface. Kolesnikov [2] presents the load–displacement and stress–strain responses of concrete under uniaxial compression as well as three-point bending. The non-destructive test (NDT) method was proposed by Lim et al. [3] for the measurement of concrete's compressive strength. The water absorption of concrete with different binders was tested by Ding et al. [4]. The pore structure of concrete was investigated by mercury intrusion porosimetry. It was found that the water absorption of concrete with mineral admixtures is lower. This is due to the existence of a reasonable pore structure. Zhao et al. [5] used the finite element method for modeling the fundamental behavior of T-beams with carbon fiber-reinforced plastic under impact loads. The results show that the overall stiffness of the T-beams was significantly improved due to the carbon fiber-reinforced plastic strips.

Zainal et al. [6] conducted an experimental study for predicting the behavior of hybrid fiber-reinforced concrete materials with a high-range water-reducing admixture. It was concluded that the Ferro with a Ferro mix combination improved the performance of concrete in the elastic stage, while the Ferro with the ultra-net combination had the highest compressive strain surplus in the plastic stage. Ahmad et al. [7] utilized artificial neural networks for determining the properties of fiber-reinforced polymers-confined concrete. Lelovic et al. [8] presented a new method for the experimental determination of cohesion at pre-set angles of shear deformation. Alrshoudi et al. [9] developed the concept of a new pre-packed aggregate fiber-reinforced concrete which is reinforced with polypropylene (PP) waste carpet fibres, investigating its mechanical properties and impact resistance under drop weight impact loads. Mohammadyan-Yasouj et al. [10] investigated the thermal performance of alginate concrete reinforced with basalt fiber. The effects of the admixtures, erosion age, concentration of sulfate solution, and sulfate erosion on the mechanical properties of mortar were investigated by Liu et al. [11]. Benbow et al. [12] presented the development of a coupled modeling simulator for assessing the evolution of a geological repository in the near field for radioactive waste disposal where concrete is used as backfill.

Muhtar et al. [13] predicted the stiffness of bamboo-reinforced concrete beams from an experimental results database using artificial neural networks. Karam et al. [14] carried out an analytical investigation on the concrete damage progress of the Perfobond shear connector under the influence of various lateral pressures. Song et al. [15] simulated the adsorption characteristics of five types of common alkanol-amine inhibitors on C-S-H gel in the alkaline liquid environment using the molecular dynamics and grand canonical Monte Carlo methods. Javed et al. [16] developed a model for predicting the ultimate axial strength of concrete-filled steel tubular columns under axial compression. Javed et al. [17] utilized novel Gene Expression Programming and regression techniques for determining the compressive strength of sugarcane bagasse ash concrete. Phutthimethakul et al. [18]

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used flue gas desulfurization gypsum, construction and demolition waste, and oil palm waste trunks to produce concrete bricks. Chen et al. [19] experimentally and numerically studied the blast-resistant performance of steel fiber-reinforced concrete and polyvinyl alcohol fiber-reinforced concrete panels with a contact detonation test.

The study presented by Alyousef et al. [20] aims to investigate the resistance of concrete composites reinforced with waste metalized plastic fibres to sulphate and acid attacks. Yehia et al. [21] studied the effect of aggregate type on concrete's compressive strength. The durability of polyvinyl alcohol fiber-reinforced cementitious composite containing nano-SiO_2 was evaluated by Liu et al. [22] using the adaptive neuro-fuzzy inference system.

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