

Comparison of artificial neural network (ANN) and response surface methodology (RSM) prediction in compressive strength of recycled concrete aggregates

Authors

Abdelkader Hammoudi, Karim Moussaceb, Cherif Belebchouche, Farid Dahmoune

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Description

This study aims at predicting and modeling the 7; 28 and 56 days compressive strength of a concrete containing concrete's recycled coarse aggregates and that, for different range of cement content and slump. To achieve this, the response surface methodology (RSM) and the artificial neural networks (ANN) approaches were used for three variable processes modeling (cement content in the range of 300 to 400 kg/m³, percentage of recycled coarse aggregate from 0 to 100% and slump from 5 to 12 ± 1 cm). The results indicate that the compressive strength of recycled concrete at 7, 28 and 56 days is strongly influenced by the cement content, %RCA and slump ($p < 0.01$). It is found that the compressive strength at 7, 28 and 56 days decreases from 22.62 to 18.56, 34.91 to 28.70 and 37.77 to 32.26 respectively with increasing in RCA from 0 to 100% at middle levels of cement content and slump. The results ...