

Bond Strength Prediction of FRP-bar Reinforced Concrete: A Multi-gene Genetic Programming Approach

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ABSTRACT

This paper presents a new multi-gene genetic programming (MGGP) approach for prediction of bond strength of Fiber Reinforced Polymers (FRP) bars to concrete. The MGGP technique models the bond behavior of FRP bars by integrating the capabilities of standard genetic programming and classical regression. The factors that affect the bond strength of FRP bars were identified from the test data of 223 beam-test specimens in the literature and fed into the GP system to produce a model. Our study concludes that the proposed MGGP model predicts bond strength of FRP bars in concrete quite accurately. Indeed, the proposed MGGP model equation has better performance than the code equation currently used by the American Concrete Institute (ACI).

CCS CONCEPTS

• Computing methodologies~Genetic Programming

KEYWORDS

Bond strength, FRP-bar, Multi-gene genetic programming

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