PREDICTION OF CREEP IN CONCRETE USING MULTI-GENE GENETIC PROGRAMMING HYBRIDIZED WITH ARTIFICIAL NEURAL NETWORK

By

ABDULAZIZ MAMDOUH ATAYA

A Thesis Submitted to the
Faculty of Engineering at Cairo University
In Partial Fulfillment of the
Requirements for the Degree of
MASTER OF SCIENCE
In
Structural Engineering

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Title of Thesis:
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Key Words:
Multi-Gene Genetic Programming; Artificial Neural Network; Creep; Concrete; Prediction Model.

Summary:
In this study a multi-gene genetic programming (MGGP) and artificial neural network (ANN) are used to develop two models for prediction of compliance in concrete. The first model was developed by MGGP technique and the second model by hybridized MGGP-ANN. A total of 187 experimental data sets are filtered from the NU-ITI database to develop this models. The two models contain six input variables which are: average compressive strength, relative humidity, volume to surface ratio, cement type, age at start of loading and age at the creep measurement. The output is compliance in concrete. The models: ACI209, CEB, B3 and GL2000 are used to confirm the accuracy of MGGP and MGGP-ANN models by comparing the results of six models against NU-ITI database. The accuracy of the models can be arranged as follows: MGGP-ANN model, GL2000 model, MGGP model, B3 model, ACI209 model and CEB model which has the least accuracy.

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