

## Accepted Manuscript

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PII: S0263-2241(17)30551-1  
DOI: <http://dx.doi.org/10.1016/j.measurement.2017.08.043>  
Reference: MEASUR 4941

To appear in: *Measurement*

Received Date: 6 November 2016  
Revised Date: 13 July 2017  
Accepted Date: 28 August 2017

Please cite this article as: S. Soleimani, S. Rajaei, P. Jiao, A. Sabz, S. Soheilinia, New Prediction Models for Unconfined Compressive Strength of Geopolymer Stabilized Soil Using Multi-Gen Genetic Programming, *Measurement* (2017), doi: <http://dx.doi.org/10.1016/j.measurement.2017.08.043>

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## New Prediction Models for Unconfined Compressive Strength of Geopolymer Stabilized Soil Using Multi-Gen Genetic Programming

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### Abstract

This study presents new models for the prediction of unconfined compressive strength (UCS) of geopolymer stabilized clayey soils using a modified branch of genetic programming, called multi-gen genetic programming (MGGP). The proposed MGGP models incorporate several parameters affecting the behavior of the UCS of the clayey stabilized soil. UCS is formulated in terms of percentages of fly ash, ground granulated blast furnace slag, liquid limit, plastic limit, plasticity index, molar concentration, alkali to binder ratio, and ratios of sodium and silicon to aluminum. The importance of each predictor variable is measured through a sensitivity analysis. The validity of the models and the trend of the results are verified by performing parametric study. The parametric study results are also in good agreement with previous studies. The results indicate that the proposed equations are capable of evaluating UCS accurately.

**Keywords:** Soil stabilization, Geopolymer, Genetic programming, Prediction

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