



Multiple Regression (MR) and Artificial Neural Network (ANN) models for prediction of soil suction

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This article presents a comparison of multiple regression (MR) and artificial neural network (ANN) model for prediction of soil suction of clayey soils. The results of the soil suction tests utilizing thermocouple psychrometers on statically compacted specimens of Bentonite-Kaolinite clay mixtures with varying soil properties were used to develop the models. The results obtained from both models were then compared with the experimental results. The performance indices such as coefficient of determination (R^2), root mean square error (RMSE), mean absolute error (MAE), and variance account for (VAF) were used to control the performance of the prediction capacity of the models developed in this study. ANN model has shown higher prediction performance than regression model according to the performance indices. It is shown that ANN models provide significant improvements in prediction accuracy over statistical models. The potential benefits of soft computing models extend beyond the high computation rates. Higher performances of the soft computing models were sourced from greater degree of robustness and fault tolerance than traditional statistical models because there are many more processing neurons, each with primarily local connections. It appears that there is a possibility of estimating soil suction by using the proposed empirical relationships and soft computing models. The population of the analyzed data is relatively limited in this study. Therefore, the practical outcome of the proposed equations and models could be used, with acceptable accuracy.