Modeling of Scouring around Submerged Pipes by Group Method of Data Handling

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Abstract

In this study, scour pattern around submarine pipelines which were located on an erodible bed was simulated using Group Method of Data Handling (GMDH). Also, to assess the performance of hybrid models, the Monte Carlo simulations (MCs) were applied. In the study, the k-fold Cross Validation (k=6) was used for examination of the models ability. Then, using the effective parameters on scour, six various GMDH model were developed. By analyzing the numerical models, the superior model was introduced. The model predicted the experimental results with reasonable accuracy. For instance, correlation coefficient, scatter index and root mean square error were calculated 0.914, 0.160 and 0.141, respectively. For a superior model, some relations were obtained in order to predict the scour around submarine pipelines. In addition, by sensitivity analysis, the most influential parameter was identified. Finally, GMDH 4 model and the ratio of the distance between pipe and erodible bed to diameter pipe (*e/D*) were introduced as the superior model and the most effective input variable, respectively.

Keywords: *Scour, Submerged pipeline, Modeling, Group Method of Data Handling (GMDH), Sensitivity analysis.*