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Development of more accurate discharge coefficient prediction equations for rectangular side weirs using adaptive neuro-fuzzy inference system and generalized group method of data handling

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Abstract

A rectangular side weir is a hydraulic structure commonly utilized all around the world in urban stormwater and wastewater sewer networks and in irrigation drainage systems to deviate excessive flow passing through the main channel. In this study, a genetic algorithm (GA) is employed to identify the best selection of adaptive neuro-fuzzy inference system (ANFIS) membership functions and the evolutionary design of a generalized group method of data handling (GMDH) structure for prediction of the side weir discharge coefficient. Moreover, the Singular Value Decomposition (SVD) method is applied to calculate the linear parameters of the ANFIS results and linear coefficient vectors in GMDH (ANFIS-GA/SVD and GMDH-GA/SVD). The side weir dimensionless length, Froude number, the

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