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River Suspended Sediment Prediction Using Various Multilayer Perceptron Neural Network Training Algorithms—A Case Study in Malaysia

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Abstract Estimation of suspended sediment discharge in rivers has a vital role in dealing with water resources problems and hydraulic structures. In this study, a Multilayer Perceptron (MLP) feed forward neural network with four different training algorithms was used to predict the suspended sediment discharge of a river (Pari River at Silibin) in Peninsular Malaysia. The training algorithms are Gradient Descent (GD), Gradient Descent with Momentum (GDM), Scaled Conjugate Gradient (SCG), and Levenberg Marquardt (LM). Different statistical measures, time of convergence and number of epochs to reach the required accuracy were used to evaluate the performance of training algorithms. The analysis showed that SCG and LM performed better than GD and GDM. While the performance of the superior algorithms (i.e., SCG and LM) is similar, LM required considerably shorter time of convergence. It was concluded that both training

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