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Multivariate Analysis on Water Quality Attributes Using Master-Slave Neural Network Model

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Abstract : Mathematical and computational functionalities such as descriptive mining, optimization, and predictions are espoused to resolve natural resource planning. The water quality prediction and its attributes influence determinations are adopted optimization techniques. The water properties are tainted while merging water resource one with another. This work aimed to predict influencing water resource distribution connectivity in accordance to water quality and sediment using an innovative proposed master-slave neural network back-propagation model. The experiment results are arrived through collecting water quality attributes, computation of water quality index, design and development of neural network model to determine water quality and sediment, master–slave back propagation neural network back-propagation model to determine variations on water quality and sediment attributes between the water resources and the recommendation for connectivity. The homogeneous and parallel biochemical reactions are influences water quality and sediment while distributing water from one location to another. Therefore, an innovative master-slave neural network model [M (9:9:2)::S(9:9:2)] designed and developed to predict the attribute variations. The result of training dataset given as an input to master model and its maximum weights are assigned as an input to the slave model to predict the water quality. The developed master-slave model is predicted physicochemical attributes weight variations for 85 % to 90% of water quality as a target values.The sediment level variations also predicated from 0.01 to 0.05% of each water quality percentage. The model produced the significant variations on physiochemical attribute weights. According to the predicated experimental weight variation on training data set, effective recommendations are made to connect different resources.

Keywords : master-slave back propagation neural network model(MSBPNNM), water quality analysis, multivariate analysis, environmental mining
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