Abstract

Chah- nimeh water reservoirs are consisted of 4 semi-natural depressions in Sistan plain which are used to control floods, to maintain water supplies of the Hirmand River, and to provide potable and agricultural water for the residents of the area. One of the most significant specifications of each reservoir is its water level. Knowing about the balance fluctuations affects interpretation and evaluation of those issues such as risk-taking associated with the installations and their related structures, water storage changes in the lake, coastal structures, and their related environmental issues. Although frequent measurement can make a general view about its changes, simulation of this variable can provide the opportunity of its prediction, particularly under various scenarios. During recent years, considerable developents have taken place in the field of artificial intelligence including neural networks. Using these networks in predicting and estimating these parameters has increased remarkably in many different scientific and engineering problems whose basis is discovery of the experimental correlation between events occurred in the past. To obtain an optimal model for simulation of the water level of the 4th reservoir, a series of input variables, such as temperature, humidity, wind speed, water level, and evaporation was used. Therefore, the network properties including number of hidden layers, number of neurons in each hidden layer, activation function, and learning algorithm using MATLAB software package were determined. Finally, the results of simulating water levels of the 4th reservoir were compared with the real data using the neural networks and ANFIS and the accuracy of these methods was assessed by RMSE, MAE and R^2 criteria. Due to the simulation of the reservoir water level by artificial intelligence models, the result shows good accuracy of these models in estimating water levels. Among them, the neural network had made a better estimation. Thus, based on statistical analysis on third test with neural network the measures levels RMSE, MAE, and R^2 Was calculated Respectively to 0.000062 , 0.000048,and 0.9998. To manage these water resources more properly, it is recommended to use artificial intelligence simulation methods in all four reservoirs of chah nimeh.

Keywords: tank, water level, neural networks, ANFIS, the 4th chah- nimeh of Sistan

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Simulation Of Fourth Chahnime Reservoir Water Level

Using Artificial Intelligence Models

Supervisor:
Dr. Farzad. Hasanpour

Advisors:
Eng. Jamshid Piri

By:
Mohammad Reza. Ebadi Nezhad

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