**عنوان مقاله:**

Peformance improvement of Neural Networks in daily streamflow prediction using principal component analysis

**محل انتشار:**

نهمین کنگره بین المللی مهندسی عمران (سال: 1391)

تعداد صفحات اصل مقاله: 8

**نویسندگان:**

M. R. Fallah Haghgoo Lialestani - *MSc Graduate in Water Engineering, Sarvab Consulting Engineers Co., Mashhad, Iran*

M. B. Sharifi - *Associate Professor, Department of Civil Engineering, Ferdowsi University of Mashhad, Iran*

M Mirabi - *Islamic Azad University, Torbat-e Heydariyeh Branch, Departemant of Civil Engineering, Torbat-e Heydariyeh, Iran*

**خلاصه مقاله:**

Successful river flow time series forecasting is a major goal and an essential procedure that is necessary in water resources planning and management. The objective of this study is to evaluate the effectiveness of Principal Component Analysis (PCA) in the improvement of the ANN model performance. In this work, we develop and test two artificial neural networks (MLP, GRNN) to forecast streamflow. MLP and GRNN models, including the original ANN model without data preprocessing, were set up and evaluated. Understanding the temporal relationships between climatic drivers and streamflow is fundamental to the model development. statistical approach depending on cross-, auto- and partial-autocorrelation of the observed data is used as a good alternative to the trial and error method in identifying model inputs. these analyses revealed temporal dependencies between the climate-flow datasets. we modeled the flow using the Principal Component Analysis (PCA) technique that reduces the number of input variables to include only the ones effective in ANN (PCA-ANN). The performance of ANN models in training and testing stages are compared with the observed streamflow values to identify the best fit forecasting model based upon a number of selected performance criteria. Under the overall consideration including the model performance and the complexity of modeling, the MLP-PC4 model was optimal

**کلمات کلیدی:**
Streamflow, MLP, GRNN, Principal Component Analysis

**لینک ثابت مقاله در پایگاه سیویلیکا:**

https://civilica.com/doc/165613