Pattern Discovery in Hydrological Time Series Data Mining during the Monsoon Period of the High Flood Years in Brahmaputra River Basin

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Abstract

In this paper, based on data mining techniques, the analysis is carried out in hydrological daily discharge time series of the Panchratna station in the river Brahmaputra under Brahmaputra and Barak Basin Organization in India. The data has selected for the high flood years 1988, 1991, 1998, 2004, and 2007. The whole year is divided into three periods known as Pre-monsoon, Monsoon and Post Monsoon. In this paper, only monsoon period data have been used. For standardization of data, statistical analysis such as mean monthly discharge, monthly Maximum Discharge, monthly amplitude and monthly standard deviation have been carried out. K-means clustering is segmented for the monsoon period process of daily discharge. Dynamic Time Warping (DTW) is used to look for similarities in the discharge process under the same climatic condition. Similarity matrix helped in the mining of discharge
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process in similar time period in the different years. The agglomerative hierarchical clustering is used to cluster and discover the discharge patterns in terms of the autoregressive model. A forecast model has been predicted on the discharge process.

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**Index Terms**

Computer Science  
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**Keywords**

data mining  hydrological time series  clustering; pattern discovery  similarity search