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SVR-based prediction of water losses combined with chaotic approach

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Both observations and climate models dictate that the global warming will amplify evaporation process. It is expected that this will be a dominant factor of decreasing water resources with the increasing world population in the near future. Thus a realistic planning of water resources is of crucial importance.

In this study, prediction of evaporation amounts is realized using Support Vector Regression (SVR) which arises from Support Vector Machine (SVM) and widely applied to nonlinear time series and prediction problems. SVR's main idea is to minimize the prediction error on the training set and also model complexity. The SVR maps the original and nonlinear input datain to a high dimensional feature space by nonlinear mapping to yield and solve a linear regression problem in this feature space. A regression function is generated by applying a set of high dimensional linear functions. SVR has many advantages such as being model independent or computationally efficient. Also it guarantees to converge to optimal solution. In literature, SVR gives excellent results in atmospheric variables when compared with conventional or modern approaches.

In application of SVR, preparation of input data does matter considerably. In this study, chaotic approach on complex time series is used for setting data. To prepare input data, phase-space reconstruction approach is utilized. Embedding parameters, namely embedding dimension and delay time, are extracted from the original time series. The prediction results of evaporation time series are very promising.

Biography

Ozlem Baydaroglu is graduated from Yıldız Technical University as an environmental engineer in 2002. Then she has completed Master of Science in environmental engineering and Master of Business Administration, respectively. Now she is lasting her PhD and working as a research assistant in Atmospheric Sciences Department in Istanbul Technical University. Her research subjects are chaos, hydrology, renewable energy and statistics in atmospheric sciences.

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Application and relevance of indigenous knowledge for flood management under climate change

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Floods are becoming increasingly common in Nepal resulting in a huge loss of life and damage to settlements, agriculture land and infrastructures in various parts of the country. Most recent research findings suggest that climate change has accelerated the intensity and frequency of flood hazards in most parts of the country. Communities are however, making use of options that increase their preparedness for these flood hazards. The random sampling (for household survey), focus group discussion, key informant interviews and field observations were employed for data collection. Based on field data, this paper intends to assess the indigenous knowledge on flood forecasting and flood management practices at the community level those are being in practiced in the plain region of West Rapti River Basin of Nepal and its relevance under climate change induced flood disaster. The research findings indicate that there are some very effective local flood forecasting practices such as identifying the position of clouds; monitoring the extent of rainfall in upper catchments; analysing the mobility of ants; analysing the magnitude of thunderstorms and wind blows; analysing the magnitude of hotness; and hearing strange sounds from river/torrents. Synthesis and analysis of these indicators helps communities to prepare for potential flood events. Theseinclude preparation of search and rescue related materials; the creation of small drainage structures in each plot of land and storage of the valuable material at a safer location; and being psychologically prepared for floods. This paper argues that these indigenous flood forecasting and management practices could be particularly useful for migrants, who are in flood prone areas but are not familiar with those practices.

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