Hydroinformatics in Hydrology, Hydrogeology and Water Resources (Proc. of Symposium JS.4 at the Joint IAHS & IAH Convention, Hyderabad, India, September 2009). IAHS Publ. 331, 2009, 41-50.

Rainfall–runoff modelling using a wavelet-based hybrid SVM scheme

RENJI REMESAN, MICHAELA BRAY, MUHAMMAD ALI SHAMIM & DAWEI HAN

Water and Environmental Management Research Centre, Department of Civil Engineering, University of Bristol, Lunsford House, Cantocks Close, Clifton, Bristol BS81UP, UK

renji.remesan@bristol.ac.uk

Abstract Efficient flood forecasting based on rainfall–runoff modelling is an important non-structural approach for flood mitigation. The support vector machine, a novel artificial intelligence-based method developed from statistical learning theory, is adopted herein in conjunction with wavelets to establish a real-time flood forecasting model. We compared them with another hybrid model called the neuro-wavelet model (NW). The methods were tested using the data from a small watershed (the Brue catchment in southwest England, UK), for which 7 years of records were available. The results reveal that the wavelet-based hybrid models can provide accurate runoff estimates for flood forecasting in the Brue catchment. In this study the training data length and input data structure were determined using another novel technique, the gamma test.

Key words hybrid models; gamma test; neural networks; flood; model selection; support vector machine