

Parameters estimation for statistical distribution using artificial neural network

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In Australia, regional flood estimation methods are used for estimation of design floods in ungauged catchments. All these techniques assume a model structure and the assumed model are then fitted using the observed data. This implies that the model structure is correct and applicable to all the data range and as such there is no attempt to alter the model structure. Thus it offers limited flexibility in improving the accuracy of model prediction. Furthermore, most regression techniques and even those that have considered the use of the artificial neural network (ANN) have been focused on the prediction of the flood quantiles. This paper focuses on the application ANN for the prediction of the parameters mainly mean, standard deviation and skews in the statistical distribution underlying the desired flood quantiles. This uses data from 399 gauging stations of New South Wales (NSW), Queensland (QLD) and Victoria (VIC) to develop a regional flood model based on ANN. The split sample validation shows that ANN can provide better estimation of parameters in the statistical LPIII distribution. The number of variables like catchment area, evapotranspiration, rainfall, latitude, longitude, design rainfall intensities (I) and slope of main stream were fed into the model. The models with only three variables catchment area, evaporation and design rainfall intensities for 2year (I2) as well as 50year (I50) were found to give better estimation of parameters.

Biography

Mandira Panday is currently studying Masters in Engineering at University of Technology Sydney (UTS).

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