

River Flow Forecast Combination Using The Multi-layer Feed Forward Neural Network

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The multi-layer feed-forward neural network (MLFN) is applied in the context of river flow forecast combination, where a number of rainfall-runoff models are used simultaneously to produce an overall combined river flow forecast. The operation of MLFN depends on the neuron transfer function, which is a non-linear function. These models, each having a different structure to simulate the perceived mechanisms of the runoff process, utilise the information carrying capacity of the model calibration data in different ways. Hence, in a discharge forecast combination procedure, the discharge forecasts of each model provide a source of information different from that of the other models used in the combination. In the present work, the significance of the choice of the transfer function type in the overall performance of the MLFN, when used in the streamflow forecast combination context is investigated. Five neuron transfer functions are used in this investigation, namely, the logistic function, the bipolar function, the hyperbolic function, the arctan function and the scaled arctan function. The results indicate that the logistic function yields the best performance.