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## Comparison of Artificial Intelligence Techniques for river flow forecasting

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**Abstract.** The use of Artificial Intelligence methods is becoming increasingly common in the modeling and forecasting of hydrological and water resource processes. In this study, applicability of Adaptive Neuro Fuzzy Inference System (ANFIS) and Artificial Neural Network (ANN) methods, Generalized Regression Neural Networks (GRNN) and Feed Forward Neural Networks (FFNN), and Auto-Regressive (AR) models for forecasting of daily river flow is investigated and Seyhan River and Cine River was chosen as case study area. For the Seyhan River, the forecasting models are established using combinations of antecedent daily river flow records. On the other hand, for the Cine River, daily river flow and rainfall records are used in input layer. For both stations, the data sets are divided into three subsets, training, testing and verification data set. The river flow forecasting models having various input structures are trained and tested to investigate the applicability of ANFIS and ANN and AR methods. The results of all models for both training and testing are evaluated and the best fit input structures and methods for both stations are determined according to criteria of performance evaluation. Moreover the best fit forecasting models are also verified by verification set which was not used in training and testing processes and compared according to criteria. The results demonstrate that ANFIS model is superior to the GRNN and FFNN forecasting models, and ANFIS can be successfully applied and provide high accuracy and reliability for daily river flow forecasting.

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