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Probabilistic streamflow forecasting for hydroelectricity production: A comparison of two non-parametric system identification algorithms

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This study is motivated by the need to robustly specify, identify, and forecast runoff generation processes for hydroelectricity production. It atleast requires the identification of significant predictors of runoff generation and the influence of each such significant predictor on runoff response. To this end, we compare two non-parametric algorithms of predictor subset selection. One is based on information theory that assesses predictor significance (and hence selection) based on Partial Information (PI) rationale of Sharma and Mehrotra (2014). The other algorithm is based on a frequentist approach that uses bounds on probability of error concept of Pande (2005), assesses all possible predictor subsets on-the-go and converges to a predictor subset in an computationally efficient manner. Both the algorithms approximate the underlying system by locally constant functions and select predictor subsets corresponding to these functions. The performance of the two algorithms is compared on a set of synthetic case studies as well as a real world case study of inflow forecasting.

References:
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