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Ascertaining Time Series Predictability in Process Control – Case Study on Rainfall Prediction

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Table of Contents

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Abstract   PDF (522.6 KB)   References

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Abstract

Rainfall prediction is a challenging task due to its dependency on many natural phenomenon. Some authors used Hurst exponent as a predictability indicator to ensure predictability of the time series before prediction. In this paper, a detailed analysis has been done to ascertain whether a definite relation exists between a strong Hurst exponent and predictability. The one-lead monthly rainfall prediction has been done for 19 rain gauge station of the Yarra river basin in Victoria, Australia using Artificial Neural Network. The prediction error in terms of normalized Root Mean Squared Error has been compared with Hurst exponent. The study establishes the truth of the hypothesis for only 6 stations out of 19 stations, and thus recommends further investigation to prove the hypothesis. This concept is relevant for any time series which need to be used for real time process control.

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