

Forecasting Chaotic time series by a Neural Network

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This paper examines how efficient neural networks are relative to linear and polynomial approximations to forecast a time series that is generated by the chaotic Mackey-Glass differential delay equation. The forecasting horizon is one step ahead. A series of regressions with polynomial approximators and a simple neural network with two neurons is taking place and compare the multiple correlation coefficients. The neural network, a very simple neural network, is superior to the polynomial expansions, and delivers a virtually perfect forecasting. Finally, the neural network is much more precise, relative to the other methods, across a wide set of realizations.

Keywords: neural network forecasting, chaos forecasting, Mackey-Glass forecasting, time series forecasting.