



Marmara University
Arts and Sciences Faculty
Department of Statistics



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**“Bootstrapped linear and nonlinear artificial neural network
for time series forecasting”**

**Department of
Statistics**

Giresun University

Research Areas

Time Series Forecasting
Fuzzy Set Theory
Computational Intelligence
Artificial Neural Networks
Machine Learnings
Applied Econometrics

Time series forecasting is important task in the real life. Artificial neural networks are a useful tool for forecasting of nonlinear time series. In the real world, time series can contain both linear and nonlinear components. One of the approaches proposed to forecast these kinds of time series is linear and nonlinear artificial neural network (L&NL-ANN). The forecasts obtained from L&NL-ANN may change depending on time series samples but this variation is neglected in the literature. In this paper, bootstrapped linear and nonlinear artificial neural network (B-L&NL-ANN) is proposed. B-L&NL-ANN considers time series samples variation and it is possible to obtain standard errors, confidence intervals for forecasts and perform linearity and nonlinearity hypothesis tests. B-L&NL-ANN uses random sub-sampling bootstrap approach for probabilistic inference, particle swarm optimization for training of the network. The forecasts of B-L&NL-ANN are obtained as a central tendency measure of forecasts' bootstrap samplings. The proposed method is compared with other methods in the literature in a Monte Carlo Simulation study and real-world time series data analysis. The strong and weak sides of the proposed method are evaluated according to applications.

Venue

Marmara University,
Göztepe Campus,
Institute Building
Conference Hall

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