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Application of Artificial Neural Network

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Abstract

Background: A neural network is a biologically-inspired programming paradigm which enables a computer to learn from observational data. The design of an artificial neural network is inspired by the biological neural network of the human brain, leading to a process of learning that's far more capable than that of standard machine learning models.

Objectives: In this paper, we discussed the processing of the brain as a basis to develop algorithms that can be used to model complex patterns and prediction problems.

Methodology: For the selection of data we used the secondary source published in the Portuguese National Statistical Institute. According the study published by Fernandes [1, 2] and Fernandez and Teixeira [5], the original time series suggests a power transformation. Therefore, we take logarithms of the data to stabilize the seasonality and variance, and we have another time series that was used during the work, namely Transformed Original Data (TOD).

Results and discussion: It can be seen that the number of hidden layer nodes has little impact on the predictive ability of the ANN. Even a network with only one hidden layer node is able to adequately map the underlying relationship. For networks with larger numbers of hidden layer nodes, there is no sign of over training, as evidenced by fairly consistent prediction errors.

Conclusions and future work: This paper presents the process of modelling tourism demand for the north of Portugal, using an artificial neural network model. The time series was considered in the logarithmic transformed data. This series was separated into a training data set to train the neural network, in a validation set, to stop the training process earlier and a test data set to examine the level of forecasting accuracy.

References

- [1] Andrews, R. and S. Geva, 1994. Rule extraction from a constrained error back-propagation MLP. Proceedings of the 6th Australian Conference on Neural Networks, (ACCN'94), Brisbane Queensland, pp: 9-12
- [2] Towell, G.G. and J.W. Shavlik, 1993. Extracting refined rules from knowledge-based neural networks. Machine Learning, 13: 71-101

