

An Application of Support Vector Regression in Forecasting

Newspaper Business Demand

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ABSTRACT

This thesis deals with forecasting newspaper for a local newspaper business. Current methodology is based on classical statistical methods such as Exponential Smoothing. However most of these classical statistical approaches are mainly focused on building regression models based only on sample data sets. In the last years new methods based on Learning Machines are being employed for forecasting problems. These methods understand universal approximations of nonlinear functions, thus resulting more able to model complex nonlinear phenomena. This study suggest the use of a predictive data mining technique called “Support Vector Regression” for forecasting daily newspaper sales for the major newspaper business in Nicaragua. In order to improve the forecasting accuracy, this thesis quantifies some factors that affect the forecasts of sales of newspaper such as: promotion, performance per outlet, weather condition, which are more suitable for this type of product. Our numerical experiments show that forecasting sales per outlet through SVR and the input variables considered outperform the current methodology employed by the company and other classical statistical approaches based on common prediction accuracy measures such as the mean absolute percentage error “MAPE”. In addition a practical model implemented in Ms Excel 3 based on genetic algorithm for variable selection and the SVR’s parameter is adapted. Our results prove that it is advantageous to apply SVM to forecast daily newspaper demand.

Keyword: sales prediction 、 newspaper circulation 、 support vector regression