Title: The Series Forecasting Of Airline Passenger No-Shows Using Fir Neutral Network

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Abstract:

In airline industry, the accurate and reliable prediction of passenger no-shows is of paramount interest as it affects the profitability of an airline. This research studies the feasibility of using the Finite Impulse Response (FIR) neural networks (NN), as an alternative to the current methods of Kalman Filter (KF) and the ARIMA models, to predict the passenger no-shows. The data used in this study are the actual no-shows statistics from two Malaysia Airlines' routes, Kuala Lumpur-London (MH2) and London-Kuala Lumpur (MHl). In developing the Kalman Filter and the ARIMA models, the research uses the Autocorrelation Function (ACF) and the Partial Autocorrelation Function (PACF), while the Dickey-Fuller test is employed to check on the stationarity of the time series. The final selection on the appropriate models is then made based on the Akaike's Information Criterion (AIC) and the Schwartz Bayesian Information Criterion (SBC). As for the FIR NN, the trainings were done over five runs, with each run consisting of ten epochs, using the Gradient Descent learning rule and the hyperbolic tangent (Ianh) transfer function. The competing models then performed a sixty-one days prediction using the recursive method, which are all done autonomously. The relative performance of the methods is then compared using the paired I-test. Furthermore, the ANOVA with control is utilised to see if the forecasting models are good predictors of the actual no-shows. Finally, to determine whether FIR NN's test results can be used to determine its future performance, the nonparametric statistic of Spearman rank correlation coefficient was employed. In all tests, the results are-reported at 95% confidence level. The empirical results show that the FIR neural network models can perform as good as the classical methods of the Kalman Filter and ARIMA. Additionally, there is evidence to show that the FIR neural network models are not origin-destination (00) specific. Lastly, the test results of FIR neural network models are found not to be good indicators of their future performance.