World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:9, No:06, 2015

Handling Missing Data by Using Expectation-Maximization and Expectation-Maximization with Bootstrapping for Linear Functional Relationship Model

Authors : Adilah Abdul Ghapor, Yong Zulina Zubairi, A. H. M. R. Imon

Abstract : Missing value problem is common in statistics and has been of interest for years. This article considers two modern techniques in handling missing data for linear functional relationship model (LFRM) namely the Expectation-Maximization (EM) algorithm and Expectation-Maximization with Bootstrapping (EMB) algorithm using three performance indicators; namely the mean absolute error (MAE), root mean square error (RMSE) and estimated biased (EB). In this study, we applied the methods of imputing missing values in two types of LFRM namely the full model of LFRM and in LFRM when the slope is estimated using a nonparametric method. Results of the simulation study suggest that EMB algorithm performs much better than EM algorithm in both models. We also illustrate the applicability of the approach in a real data set.

Keywords : expectation-maximization, expectation-maximization with bootstrapping, linear functional relationship model, performance indicators
Conference Title : ICMCSSE 2015 : International Conference on Mathematical, Computational and Statistical Sciences and Engineering
Conference Location : London, United Kingdom
Conference Dates : June 28-29, 2015