Robust Regression Analysis Using Redescending M and MM Estimators Based on Modified Cauchy Function

Khalaf S. Sultan and S.R. Al-Dawsari
Department of Statistics and Operations Research,
College of Science, King Saud University,
P.O.Box 2455, Riyadh 11451, Saudi Arabia
ksultan@ksu.edu.sa

Abstract

We propose the modify Cauchy function that can be used to develop redescending *M* and *MM* estimators in robust regression. The proposed modified Cauchy estimator competes Tukey's biweight and Qadir's beta resulting in its enhanced efficiency. In addition, to show the usefulness of the proposed technique, we carry out some Monte Carlo simulation experiments. Further, we apply the findings to some real data set.

Keywords
Least Squares; outliers; Huber function; Hampel function and Tukey's function.

Biography

Khalaf S. Sultan is a Professor at King Saud University, Saudi Arabia. He earned B.S. in Mathematics from Assuit University Egypt, Master in Mathematical statistics from Assuit University, Egypt and Ph.D in Statistics from Al-Azhar University Egypt under the channel system with McMaster University, Canada. He has published journal and conference papers. His research interests include statistical inference, Modeling and Simulation, optimization, reliability and mixture models.

S.R. Al-Dawsari is earned B.S in Mathematics and M.Sc in statistics from King Saud University. Now she is a formal Ph.D student in the department of statistics and operations research at King Saud University.