

# Abstract

ON ANALYSIS AND ROBUST PARAMETER

ESTIMATORS

In this paper we examine a few regression techniques such as classical linear regression, principal component regression and the partial least squares. The strengths and weaknesses of these techniques are explored. The purpose of this paper is to review and explain these techniques in a simple form and to give applications whenever possible so that even the reader who is not mathematically inclined would understand. A Microsoft Excel sheet was created to help the reader apply the PLS algorithm to any data set. Because of its simplicity, it is especially helpful for people who are not too familiar with computer programming. We also perform a comparative study by calculating the mean square error of the regression methods to test their performance on a given data set. In Chapter 7 and 8, the robust parameter estimator for the Exponential Distribution put forth by Ahmed et al (2005) is partially extended for the Two-Parameter Exponential Distribution and the Laplace Distribution. We seek out the region where points from the observations must be rejected in order to obtain results that are more reliable.

Keywords: Regression; Partial Least Squares; Principal Components, Mean Square Error; Robust; Weighted Likelihood Estimator

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