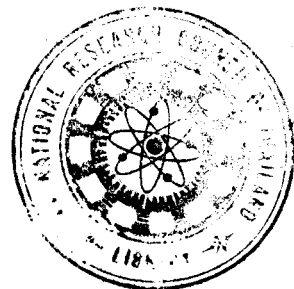


SECOND ORDER TERMS IN LP-BASED MODELS TO SOLVE THE STATISTICAL DISCRIMINANT PROBLEM



Abstract

Much research has been devoted to evaluating the performance of a variety of mathematical programming models relative to the standard parametric procedures. While many of these models have displayed excellent classificatory performance when compared to Fisher's method, these mathematical programming models cannot compete with Smith's quadratic discriminant method on certain data sets. In this paper, we investigate the appropriateness of including second order terms in mathematical programming models. A simulation study is conducted to assess the relative performance of two mathematical programming models with higher order terms in comparison to the performance of the parametric procedures. We prove that these two mathematical programming models remain rotationally and translationally invariant when all the second order terms are included in the models.

Introduction

Mathematical programming approaches for solving the statistical classification problem have been given considerable attention since their introduction by Freed and Glover (1981) and Hand (1981). These mathematical programming models provide alternate approaches to the standard parametric procedures. Fisher's (1936) linear discriminant function (LDF) procedure and Smith's (1947) quadratic discriminant function (QDF) procedure are the standard procedures. In many research papers involving