

ABSTRACT

This dissertation is a survey and synthesis of work done by various researchers on the identification and rejection of outliers which arise in samples drawn from normal populations.

Chapter I describes the causes of outliers, the various mathematical models which may be used to describe the outlier generation process and the basic approaches to the problem of dealing with outliers. It includes a brief account of the history of the subject.

Chapter II and III are primarily concerned with the identification of outliers. In Chapter II various tests are developed for deciding whether or not a single outlier is discordant. In certain situations 'best' tests are given but, in general, no optimal procedures are known and the merits of various tests are compared by the use of large-scale sampling experiments on the computer.

In Chapter III the more general problem of deciding whether several outliers are discordant is discussed. The important phenomenon of masking is dealt with. Both single stage and sequential methods are considered and their relative effectiveness is investigated by the use of sampling experiments and also by drawing their sensitivity surfaces.

Chapter IV considers the problem of outliers when the focus is on estimation and not on the outliers themselves. The premiums and protections of a few rejection rules are calculated and the performances of the various rules are compared.

His guidance in the preparation of this dissertation is gratefully acknowledged. I also thank Mr. Chandra Sekhri and Miss Lata Bhatnagar for their efficient typing and Mr. Vaidya Jagdishan for his assistance in copying and printing the dissertation.