



# Robust statistical inference based on the $C$ -divergence family

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## Abstract

This paper describes a family of divergences, named herein as the  $C$ -divergence family, which is a generalized version of the power divergence family and also includes the density power divergence family as a particular member of this class. We explore the connection of this family with other divergence families and establish several characteristics of the corresponding minimum distance estimator including its asymptotic distribution under both discrete and continuous models; we also explore the use of the  $C$ -divergence family in parametric tests of hypothesis. We study the influence function of these minimum distance estimators, in both the first and second order, and indicate the possible limitations of the first-order influence function in this case. We also briefly study the breakdown results of the corresponding estimators. Some simulation results and real data examples demonstrate the small sample efficiency and robustness properties of the estimators.

**Keywords**  $C$ -Divergence · Density power divergence · Generalized power divergence · Power divergence

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