

LINEAR LOCATION ESTIMATORS:  
THE DEPENDENCE OF THEIR QUALITY ON THE SHAPE  
OF THE PROBABILITY DENSITY FUNCTION,  
AND THEIR ROBUSTNESS

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The dependence of the performance of linear location estimators on the shape of the probability density function is investigated. Density functions are classified by their shape, and it is seen how the form and the variance of the best linear location estimator for a distribution varies as the shape of the density function varies. Further, in an attempt to understand why a particular estimator is best for a given shape of density function, the estimation of certain simple distributions ("step" distributions) is considered.

The classification of distributions by their shape allows the robustness of various linear estimators to be tested over an organized and representative set of distributions. Consideration is given to the merits of various measures of the robustness of an estimator and a new measure is proposed. It is found that the assessment of the robustness of an estimator requires consideration of factors which have hitherto been neglected.

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