

Bibliographic Reference: Kourouklis, S., Petropoulos, K., & Piperigkou, V. (2015). Topics in Parametric Statistical Inference: estimation and confidence intervals [Undergraduate textbook]. Kallipos, Open Academic Editions. http://dx.doi.org/10.57713/kallipos-483

Abstract

The concept of population, sample, and parameter. General information on estimation measures. Criteria for selecting estimators, mean square error, unbiased estimators. Cramér-Rao inequality and Fisher's statistical information. Sufficiency, completeness, AUE estimators. Estimation in exponential distribution families. Basu's theorem, independence of sample mean and sample variance in normal populations. Sample distributions. Maximum likelihood method and moment method. Elements of statistical decision theory, loss function and risk function. Bayes and minimax estimators. Confidence intervals, guide quantity. Asymptotic confidence intervals. Applications to normal and binomial populations. The concept of statistical hypothesis and statistical hypothesis testing. Type I error, type II error, test power. Relationship between tests and confidence intervals.



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