GRADUATE SEMINAR

Chengyu Gao

Asymptotic and Bootstrap Confidence Intervals for the Ratio of Modes of Log-normal Distributions

PhD Student supervised by Dr. Andrei Volodin and Dr. Yiyu Yao

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Abstract: The log-normal distribution is essential for modelling life-time data. Consequently, the log-normal distribution is used in real-world situations. As a measure of central tendency, the mode corresponds to the most typical value within the data set. The goal of this section is to estimate the confidence intervals (CIs) for the ratios of modes of two log-normal distributions using the asymptotic confidence interval (CI_{Asym}) and three varieties of bootstrap confidence intervals (CI_{t-boot}, CI_{p-boot}, and CI_{s-boot}). To provide the estimate of ratios of modes, I use the MLE of two parameters of log-normal distribution $\hat{\mu}$ and $\hat{\sigma}$. The effectiveness of the proposed CI methods is evaluated in terms of their coverage probabilities and average widths via simulation. The proposed CI methods were evaluated by applying them to real-world data on PM2.5 mass concentration in two areas of Thailand.

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