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Test for homogeneity in gamma mixture models

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Finite mixture models underpin a variety of tools in major fields of statistical research. A mixture model is capable of describing complex distributions by an approximate selection of its components. Determination of the number of components in finite mixture models is a long-standing problem. A number of suggestions are available but a commonly-accepted solution is still overdue. An obvious way to approach the problem is the likelihood ratio test. It is well-known that regularity conditions do not hold and standard chi-squared distribution fails to apply. A penalized approach restores some of the conditions and consistency of parameter estimators. A modified likelihood ratio statistic which adds a penalty function to the ordinary likelihood ratio statistic is studied. Investigation is confined to the gamma mixture models which are one of the most common statistical techniques in biostatistics. The limiting distribution of chi-bar-squared distributions is obtained. It is noted that the modified likelihood ratio statistic degenerates to zero with a non-zero probability. Calculating this probability is not an easy task. Recommendations are made with respect to the application of the penalized approach.

Biography

Tony Siu Tung Wong has completed his PhD from The University of Hong Kong, Hong Kong. His research interests include extreme value analysis, model selection, statistical inference and time series analysis.

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