

Abstract

Traditional statistical hypothesis testing is completely assumed that the data are from some statistical distribution. However if the data includes many uncertainties, fuzzy hypothesis testing will be useful in this condition. Thus it can be seen that fuzzy inferential statistics is gradually emphasized in modern world due to the development of complex social phenomenon. In this paper, the ordination technique, based on the fuzzy data, of fuzzy numbers and intervals will be defined by simple computations with fuzzy theories, and this technique will be applied to statistical testing. In another word, traditional nonparametric statistical hypothesis testing could not deal with the data from fuzzy numbers or intervals. To be successful for this, we provide Kruskal-Wallis Test and Run Test in this paper. The testing techniques mentioned by this paper could solve the limitation of fuzzy samples. Some empirical examples will be given to show for this.

Furthermore, traditional statistical regression models assume that the uncertainty of the observed values is from random sampling. Nevertheless, fuzzy statistical regression models assume that the uncertainty of the observed data is from the phenomenon of Multiple Membership. Therefore we bring up Theil fuzzy nonparametric regression model considering nonparametric statistical techniques and fuzzy regression models. One practical example is given to show the application for this fuzzy nonparametric regression model in this paper.

摘要

傳統的統計方法檢定都假定資料來自於某個分配，但若假設檢定包含著不確定性時，有關模糊數的假設檢定有其重要性。由此可知，模糊統計推論已逐漸受到重視，這是符合現在複雜的社會現象所自然發展的結果。針對模糊資料，本文嘗試以簡易的計算配合模糊理論，定義出模糊數及模糊區間的排序方法，並將此方法應用在檢定上。即針對傳統無母數檢定方法，在無法解決參數假設為模糊數或是模糊區間值的情形下，為改進此一缺點，本文提出模糊 Kruskal-Wallis 檢定和 Run test 檢定。由實証的例子顯示，本文提出的檢定方法能有效解決模糊樣本問題。

再者，傳統的統計迴歸模式，假設觀察值的不確定性來自於隨機現象，但模糊迴歸則考慮不確定性來自於多重隸屬現象。因而以無母數統計方法，配合模糊迴歸理論，進而提出模糊無母數迴歸 Theil 法，並應用實際的例子，以顯示其存在的實質意義。

