1 Introduction

Most of statistical data we use are crisp. The meaning of crisp is halved in logic, for instance, a statement can be true or false and nothing between them. But in realistic, many measurements include vagueness. Take human thought for example, when someone asks you that "Do you feel happy today?". The answer might be neither Yes nor No. It may be happy is more than unhappy. For the reason given above, we find that the use of fuzzy statistics analysis have exhibited more appropriate interpretations and accurate measuring than those of the traditional ways.

Dr. Lotfi Zadeh (1967) is the first scholar who proposes the concept of fuzzy logic. Until now the concept has been extensively applied in many fields. Instead of the common "true or false" Boolean logic, fuzzy logic is an approach to compute "degrees of truth". Fuzzy logic uses 0 and 1 as extreme values of truth but also includes the various conditions of truth in between, take the result of a comparison of the weight of two boxes for example, the outcome could be not "heavy" or "light" but "0.85 of heavies."

Although a large number of studies have been made on fuzzy data, little is know about the construct of fuzzy data especially for continuous type. In social science research, traditional survey forces people to choice from the survey. But the vagueness of human thoughts is ignored. To gather the data with vagueness, in this paper we provide an approach based on GSP to construct continuous fuzzy data. Having decided the fuzzy, the thing which we interested in is "How to use statistical tests with fuzzy data?" Traditional nonparametric statistical hypothesis tests complete assume that the data are crisp. But when one turns from crisp data to fuzzy data, the problem arise. A great deal of error has been made on nonparametric tests with interval-valued data [5] [6] [8]. However, there are various types of fuzzy data not only interval-valued ones.

Ranking data is an important concept in statistics and fuzzy statistics has no exception. Ranking method for fuzzy numbers has so far not been defined uniquely semantically, and probably never will. The problem of ranking fuzzy numbers has been studied by many authors who have followed quite different methods. Zhang [5] ranks data by center point of each fuzzy numbers. Chen [6] ranks data by center point and radius of each fuzzy numbers. Both Zhang and Chen are easy in computing but can only deal with interval-valued numbers. Cheng [1] uses geometric center to rank all types of convex numbers even though the numbers are abnormal but it's not easy to find geometric center of a fuzzy number. Besides, you need to calculate the distance between geometric center and original point. This method can not rank symmetric fuzzy numbers. For example, Fig. 1 shows two fuzzy numbers $\tilde{A}$ and $\tilde{B}$ is symmetric to *y*-axis. The two numbers have the same distance between geometric center and original point. Yager [7] ranks all types of convex fuzzy number by calculating their mean values.

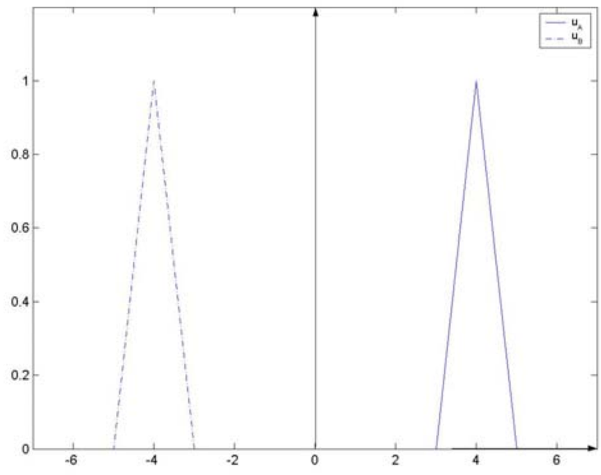

Figure 1 Two symmetric fuzzy numbers

The aim of this paper is not only to provide a method to get a fuzzy sample but also find a test technique could solve the limitation of fuzzy sample types.