

Expectation Maximization Algorithms for Estimating Bernstein Copula Density

Xiaoling Dou*

The Institute of Statistical Mathematics, Japan xiaoling@ism.ac.jp

Satoshi Kuriki

The Institute of Statistical Mathematics, Japan kuriki@ism.ac.jp

Gwo Dong Lin

Institute of Statistical Science, Academia Sinica, Taiwan

gdlin@stat.sinica.edu.tw

Baker(2008) proposed a method to construct multivariate distributions with fixed marginals. This is another representation of the copula function with Bernstein polynomial basis. In view of Baker's construction, this Bernstein copula is regarded as a finite mixture distribution. We propose Expectation Maximization (EM) algorithms to estimate Bernstein copula function, and prove the local convergence property. We also provide asymptotic properties of the proposed estimators as semiparametric estimators. These methods are demonstrated using real datasets.

Key Words: Baker's distribution, Bernstein polynomial, density estimation, linear convergence, order statistic, ordered categorical data