

A Bivariate Distribution Estimation Method Based on Level Crossings

M. L. HUANG, *Department of Mathematics, Brock University, St. Catharines, Canada*, E-mail:

mhuang@brocku.ca

W. K. Yuen, *Department of Mathematics, Brock University, St. Catharines, Canada*

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Abstract: A method of nonparametric bivariate distribution estimation based on a *bivariate sample level crossing function* is introduced in this paper, which leads to the construction of a *bivariate level-crossing empirical distribution function (BLCEDF)*. An efficiency function for this *BLCEDF* relative to the classical empirical distribution function (e.d.f.), is derived. The *BLCEDF* gives more efficient estimates than the e.d.f. in the tails of *any* underlying continuous distribution, for both small and large sample sizes. We use a smoothing technique on the *BLCEDF* for various distributions, the results of simulations confirm the theoretical results.

References

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