ASYMPTOTIC MULTIVARIATE NORMALITY FOR THE SUBSERIES VALUES OF A GENERAL STATISTIC FROM A STATIONARY SEQUENCE WITH APPLICATIONS TO NONPARAMETRIC CONFIDENCE INTERVALS

E. Carlstein

Abstract: Let \( \{Z_i : -\infty < i < +\infty\} \) be a strictly stationary \( \alpha \)-mixing sequence with unknown marginal distributions and unknown dependence structure. Suppose that, given data \( \overline{Z}_{im} := (Z_{i+1}, Z_{i+2}, \ldots, Z_{i+m}) \), the statistic \( s_{im} := s_m(\overline{Z}_{im}) \) is a point estimator of the unknown parameter \( \theta \). If a sample series \( \overline{Z}_{in} \) is available, then the subseries values \( s_{im}(0 \leq i < i + m \leq n) \) may be used to construct a nonparametric confidence interval on \( \theta \) via either Student’s distribution or via the Typical Value principle. The asymptotic justification for both methods rests upon a more general result which provides necessary and sufficient conditions for asymptotic multivariate normality of subseries values.

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