U-Statistics of Strongly Mixing Data

Martin Wendler

Ruhr University, Bochum

U-Statistics are a broad class of nonlinear functions. Their asymptotic normality has so far been proved for iid data and under various mixing conditions such as absolute regularity, but not for strong mixing. We use a coupling technique introduced in 1983 by Bradley [1] to prove a new generalized covariance inequality similar to Yoshihara's [4]. It follows with the help of the Hoeffding-decomposition [3] and this inequality that U-statistics of strongly mixing observations converge to a normal limit if the kernel of the U-statistic fulfills some moment and continuity conditions.

References

[1] R.C. Bradley, Approximation theorems for strongly mixing random variables, *Michigan Math. J.* **30** (1983) 69-81.

[2] H. Dehling, M. Wendler, Central limit theorem and the bootstrap for U-statistics of strongly mixing data, *preprint* arXiv:0811.1888.

[3] W. Hoeffding, A class of statistics with asymptotically normal distribution, *Ann. Math. Stat.* **19** (1948) 293-325.

[4] K. Yoshihara, Limiting behavior of U-statistics for stationary, absolutely regular processes, *Z. Wahrsch. verw. Gebiete* **35** (1976) 237-252.