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A note on the use of V and U statistics in nonparametric models of regression

Abstract We establish the $\sqrt{n}$ asymptotic equivalence of V and U statistics when the statistic's kernel depends on n. Combined with a lemma of B. Lee this result provides conditions under which U statistics projections and V statistics are $\sqrt{n}$ asymptotically equivalent. The use of this equivalence in nonparametric regression models is illustrated with several examples; the estimation of conditional variances, skewness, kurtosis and the construction of a nonparametric R-squared measure.

Keywords U statistics · V statistics · local linear estimation