

The pair correlation function is a fundamental spatial point process characteristic that, given the intensity function, determines second order moments of the point process. Non-parametric estimation of the pair correlation function is a typical initial step of a statistical analysis of a spatial point pattern. Kernel estimators are popular but especially for clustered point patterns suffer from bias for small spatial lags. In this paper we introduce a new orthogonal series non-parametric estimator. The new estimator is consistent and asymptotically normal according to our theoretical and simulation results. In our simulations the new estimator outperforms the kernel estimators in particular for Poisson and clustered point processes.