
Detection of dependence patterns with delay

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Résumé

The Unitary Events (UE) method is a popular method used to detect dependence patterns of joint spike activity among simultaneously recorded neurons. The method based on binned coincidence count (discrete time) was first introduced in S. Grün's PhD thesis (1996). This binned coincidence count has recently been transposed in the continuous time framework (point processes) by Tuleau-Malot and al. (2014) with the notion of delayed coincidence count for two neurons. The extension of this count to more than two neurons is the objective of the present work. Under a Poissonian assumption, we are able to compute the expectation and variance of this coincidence count under the independence hypothesis, which leads to an independence test. The possibility to weaken the Poissonian assumption is shown by an empirical study.

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