The University of Chicago

Department of Statistics

Seminar

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"Point-Stationarity in d Dimensions and Palm Theory"

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110 Eckhart Hall, 5734 S. University Avenue

ABSTRACT

Point-stationarity formalizes the intuitive idea of a simple point process in R^d, $d1$, for which the behaviour relative to a given *point of the process* is independent of the point selected as origin.

Note that point-stationarity is different from stationarity. Stationarity means that the behaviour of the point process relative to any given nonrandom site is independent of the site selected as origin. For instance, when $d = 1$, the Poisson process with constant intensity is stationary since if the origin is moved from 0 to any other fixed site t then we still have a Poisson process with the same intensity. But if a point is added at 0 then we obtain a non-stationary process since if the origin is moved from the point which we placed at 0 to any other fixed site t then there need not even be a point there. This new process, however, is point-stationary since seen from the point which we placed at 0 the intervals between points are i.i.d. exponential and this will still be true if we move the origin, for instance, to the first point on the right of the point at 0.

Thus for $d = 1$ point-stationarity has a straighforward definition: it means distributional invariance under shift of the origin to the nth point on the right (or left) of the point at 0. For $d > 1$ this definition clearly does not work. But is there some similar way of moving between points in higher dimensions?

In this talk we define point-stationarity in $d > 1$ dimensions. Our definition turns out to be the characterizing property of the so-called Palm version of a stationary point process. We also sketch a modified Palm theory where the following shift-coupling result is central: the stationary and point-stationary processes can be represented as a single process seen from different origins.

Reference:

Thorisson, H. (2000). Coupling, Stationarity, and Regeneration. Springer, NY.
