

20th Workshop on Stochastic Geometry, Stereology and Image Analysis

2–7 June, 2019, Sandbjerg Estate, Denmark

Abstract



Patrick Rubin-Delanchy

Spectral embedding of graphs

In this talk I will present recent statistical results on spectral embedding, or the representation of a graph as a point cloud using the spectral decomposition of its adjacency matrix (and other related structures such as the normalised Laplacian). In particular I will introduce a model, called the generalised random dot product graph, under which the points can be interpreted as latent position estimates. This allows us to make statements of uncertainty about the points in ordinary statistical language, for example, using confidence intervals. Popular community-based network models such as the mixed membership and standard stochastic block models are analysed as special cases, and we will also touch on estimating other forms of community structure using topological data analysis. Results are illustrated with cyber-security applications.