

Poisson Heterogeneous Random-Connection Model

Abstract

Random networks with long-range connections have received much attention in the past few years because of their importance in various applications such as social and financial network modeling. We introduce a heterogeneous random-connection model in \mathbb{R}^d , $d \geq 1$, which modifies the classical long-range percolation models in \mathbb{Z}^d and \mathbb{R}^d . Consider the random graph whose vertices are generated by a homogeneous marked Poisson point process in \mathbb{R}^d . The probability of an edge between two vertices is determined by their distance and the corresponding marks. In this model we study the degree distribution of the vertices and the percolation properties of the resulting random graph.