

1113-60-179

Justin Coon, Carl P Dettmann* (carl.dettmann@bris.ac.uk) and **Orestis Georgiou.**

Random geometric graphs in domains with fractal boundaries. Preliminary report.

Introduced by Gilbert in 1961, random geometric graphs remain a useful model for wireless networks. They are constructed from a Poisson point process by linking points with mutual distance below a fixed bound. Here we also impose a line-of-sight condition if the domain is not convex. At high density, the probability that the graph is connected is controlled by isolated points, which are more likely near boundaries of the domain. This probability can be approximated using a sum over boundary components if the boundaries are smooth, and the connection probability approaches unity. In contrast, fractal boundaries, relevant to networks in complex environments, lead to stretched exponential decay of the probability with density. For exactly self-similar boundaries, the exponent is related to the similarity dimension. The question of what dimension is relevant more generally will also be discussed. (Received August 21, 2015)