Stochastic geometry and modelling of complex telecommunication networks

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Abstract

Modern telecommunication networks have an extremely complicated topology consisting of many different components arranged in a hierarchical manner. This complicates macro-economic analysis and performance evaluation/optimisation of these networks as the full description is generally too cumbersome. We show how modelling different network components by means of spatial stochastic processes and their interconnectios as related geometric contructs one may arrive at analytically treatable models possessing only a few structural statistically identifiable parameters. Stochastic geometry and point process techniques enables us to express the main performance characteristics as a function of these parameters. This simplified yet adequate description opens ways to cost evaluation and analysis of different strategic evolution scenarios for network development.

11.5.2005