

Random graphs and its applications for networks

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Diffusion on the lifted Sierpinski gasket

The theory of rough paths allows one to integrate differential forms or solve differential equations driven by rough signals, at the price of enriching them with the equivalent of their iterated integrals. This theory typically applies to paths of stochastic processes which are irregular by nature.

In this talk, we consider the construction of a diffusion living in the horizontal lift of the Sierpinski gasket. Such a diffusion lives in the Heisenberg group. It is then a suitable candidate for being a rough path. B.

Hambly and T. Lyons have already constructed the lift of a diffusion on the Sierpinski gasket using piecewise linear interpolation. We construct here a different process by lifting first the Sierpinski gasket to a fractal in the Heisenberg group and then by identifying a suitable Dirichlet form from a discrete network of resistances.

From a joint work with Samia Harketi (Tunis) and Ezedine Haouala (Monastir).