Probabilistic Analysis for Length of the Longest Increasing Subsequences

Abstract The study of longest increasing subsequences (LIS) dates back to Erdos and Szekeres (1935). Now it is a well-studied object in random combinatorial optimization and random growth processes. In this talk we will briefly review some remarkable results on the asymptotic distribution theory of LIS, like the law of large numbers (Hammersley's solution to Ulam's problem), the central limit theorems (Tracy-Widom law) and large deviation principles. We will also report a recent work on the law of the iterated logarithm for Poissonized version of LIS.

Dimension and Measure of the Range and Graph of Space-Time Anisotropic Gaussian Random Fields

Abstract Let $X = \{X(t), t \in R^N\}$ be a centered space-time anisotropic Gaussian random field with values in R^d with stationary increments, whose components are independent but may not be identically distributed. Under certain mild conditions, we determine the exact Hausdorff measure functions, Hausdorff and packing dimensions for the range set $X([0,1]^N)$ and graph set $GrX([0,1]^N)$. Our results extend corresponding results for fractional Brownian motion, time-anisotropic and space-isotropic Gaussian random fields..

Maximizing insurer's firm value by dividend and reinsurance with a random time horizon

Abstract We investigates optimal dividend and reinsurance policies for an insurer with a random time horizon. The goal of the insurer is to maximize the value of the insurance company when the random time or the ruin time arrives. This value consists of three parts: the dividends up to the random time or the ruin time, the surplus at the random time or the ruin time and the company's brand value. We identify the insurer's joint optimal strategies using stochastic control methods. The results reveal that managers should consider no reinsurance if and only if the brand value or the surplus is too high, less reinsurance is bought when the surplus increases, and dividends are always distributed using the barrier strategy.

Monotone B-spline support vector quantile regression

Abstract Support vector quantile regression (SVQR) has attracted a lot of researchers attention and research in the past ten years because of its advantages such as the high efficiency of support vector machines and the robustness of quantile regression, as well as a large number of related literature on its application and theoretical nature. However, some functions are monotonic in practical application, and its necessary to add additional restrictions to the model to ensure its monotony. In this talk, by using the quadratic B-spline as the base function and restrict its 1st derivative nonnegative, a monotonic B-spline support vector quantile regression (MBSVQR) method is proposed and strict monotony can be achieve. On the other hand, we select the hyperparameters through the leave-one Cross Validation (CV). The simulation and application show that MBSVQR and monotonic B-spline quantile regression (MBQR) are comparable, and under certain circumstances, MBSVQR is superior to SVQR, monotonic support vector quantile regression (MSVQR) and MBQR.

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