ORDERED PROCESSES AND HIGH DIMENSIONAL LINEAR MODELS

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ABSTRACT

Ordered processes can be viewed as a natural generalization of the standard Wiener process: a separable zero mean process $\xi(t),\ t \geq 0$ is called ordered if $\mathbf{E}\xi(t_1)\xi(t_2) \geq \min\{\mathbf{E}\xi^2(t_1), \mathbf{E}\xi^2(t_2)\}$. In this talk we discuss how can these processes be used for recovering an unknown vector θ from the noisy data $Y = A\theta + \epsilon$, where A is a known $m \times n$ - matrix and ϵ is a white Gaussian noise. It is assumed that m and n are large and to estimate θ, we use a spectral regularization governed by a regularization parameter which should be chosen with the help of the data Y. The talk is focused on data-driven regularization methods related to the principle of empirical risk minimization and we provide some new non-asymptotic oracle inequalities based on simple probabilistic properties of ordered processes.