Closed-Form Sharma-Mittal Entropy Rate for Gaussian Processes

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Abstract : The entropy rate of a stochastic process is a fundamental concept in information theory. It provides a limit to the amount of information that can be transmitted reliably over a communication channel, as stated by Shannon's coding theorems. Recently, researchers have focused on developing new measures of information that generalize Shannon's classical theory. The aim is to design more efficient information encoding and transmission schemes. This paper continues the study of generalized entropy rates, by deriving a closed-form solution to the Sharma-Mittal entropy rate for Gaussian processes. Using the squeeze theorem, we solve the limit in the definition of the entropy rate, for different values of alpha and beta, which are the parameters of the Sharma-Mittal entropy. In the end, we compare it with Shannon and Rényi's entropy rates for Gaussian processes.