RÉNYI ENTROPY AND VARIANCE COMPARISON FOR SYMMETRIC LOG-CONCAVE RANDOM VARIABLES

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Rényi entropy of order $\alpha \in (0,\infty)\setminus\{1\}$ of a random variable X with density f is defined as

$$h_\alpha(X) = \frac{1}{1-\alpha}\log\left(\int f^\alpha(x)\mathrm{d}x\right).$$

In my talk I would like to present the result that the minimizer of the Rényi entropy of order α among symmetric log-concave random variables with fixed variance is either uniform distribution or two-sided exponential distribution.

Furthermore, we can infer that in non-symmetric case one-sided exponential distribution is the minimizer for $\alpha \geq 2$.

References

[1] M. Białobrzeski, P. Nayar, Rényi entropy and variance comparison for symmetric log-concave random variables, arxiv:2108.10100, to appear in IEEE Transactions on Information Theory