Random Number Generation: Old and New

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Abstract: In this talk, we consider the problem of exactly generating a general random process (target process) by using another general random process (coin process). We review some classic results such as von Neumanns algorithm for generating the unbiased random number from biased random number and Knuth and Yaos algorithm for generating biased random number from unbiased random number. Then, we review Han and Hoshis interval algorithm, which generates biased random number from biased random number. Using the information spectrum approach, we prove optimality of the interval algorithm for a wide class of general sources.

This talk is based on joint work with Te Sun Han (arXiv:1904.09782).