

Rare Event Simulation Using Reversible Shaking Transformations

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Abstract :

We introduce random transformations called reversible shaking transformations which we use to design two schemes for estimating rare event probability. One is based on interacting particle systems (IPS) and the other on time-average on a single path (POP) using ergodic theorem. We discuss their convergence rates and provide numerical experiments including continuous stochastic processes and jump processes. Our examples cover rather important situations related to insurance, queueing system and random graph for instance. Both schemes have good performance, with a seemingly better one for POP.

Joint work with Gang LIU (Ecole Polytechnique).