Rare event simulation for piecewise deterministic Markov processes

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Abstract

The reliability assessment of certain industrial systems involves the estimation of the probability of a rare event expressed in terms of a piecewise deterministic Markov process. In this talk we introduce an importance sampling method and a particular filter method adapted to this class of processes. We investigate the convergence properties (consistency and asymptotic normality) of the estimators of these methods. We compute and estimate their asymptotic variances to quantify the variance reduction.
These results essentially come from the PhD thesis of Thomas Galtier (Electricite de France - Ecole polytechnique).

Keywords: rare event, piecewise deterministic Markov process, importance sampling, particule method

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