The nonlinear seismic dynamic time-dependent reliability of anchored slope based on machine learning algorithm

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For the stochastic seismic dynamic performance assessment of structures such as slopes, almost all high-dimensional reduction methods and sampling strategies are all aimed at reducing the number of deterministic samples. Whether the Monte Carlo simulation or other Stochastic Dynamics methods will inevitably face a challenge of a series of deterministic nonlinear dynamic time history analysis, even then, the amount of computation is enormous and time consuming in some cases. However, since it takes much time on the nonlinear seismic dynamic time history analysis of single sample, the calculation time and cost of a fixed number of deterministic analyses are not underestimated. In order to fundamentally improve the computational efficiency of reliability analysis of anchored slope, this paper attempts to introduce the machine learning algorithm, which can effectively reduce the computational time and provides a new method for dynamic reliability analysis.