Abstract

Weak convergence techniques provide paths in analyzing various stochastic approximations of dynamical systems subject to the effect of small random perturbations. In both average and diffusion approximations, the smallness of the effect of the perturbations is ensured by quick oscillations of the random perturbation process. Limit theorems generalizing classic types such as: the law of large numbers, the central limit theorem, and large deviations, are developed for systems perturbed by ergodic Markov and semi-Markov processes.

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