

Title : Large Deviations for Empirical Measures of Self-Interacting Markov Chains

Let Δ^o be a finite set and, for each probability measure m on Δ^o , let $G(m)$ be a transition kernel on Δ^o . Consider the sequence $\{X_n\}$ of Δ^o -valued random variables such that, and given X_0, \dots, X_n , the conditional distribution of X_{n+1} is $G(L^{n+1})(X_n, \cdot)$, where $L^{n+1} = \frac{1}{n+1} \sum_{i=0}^n \delta_{X_i}$. Under conditions on G we establish a large deviation principle for the sequence $\{L^n\}$. As one application of this result we obtain large deviation asymptotics for the Aldous-Flannery-Palacios (1988) approximation scheme for quasi-stationary distributions of finite state Markov chains. The conditions on G cover other models as well, including certain models with edge or vertex reinforcement.