Limit theorems for one class of ergodic Markov chains

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Abstract

In this dissertation, we start with giving an intuitive background on the limit theorems for Markov chains. Since my work includes both discrete and continuous-time Markov chains, we provide some preliminary work on both cases. Later on, we continue with explanations of the two methods, namely Döblin method and Martingale approximation, to prove the Central Limit Theorem for the Loop Markov chains. After we are done with the preliminary work, we introduce three models of Loop Markov chain, and we prove the Central Limit Theorem for a special class of functionals. Then, we talk about Random Number Generators (RNG's) which are appropriate applications of Loop Markov chains. However, for arbitrary functionals situation is a little bit more complicated where we study convergence to the stable limiting distributions.

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