SEQUENTIAL MONTE CARLO IN SEQUENCE

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Abstract

Reliability evaluation is one of the most needed in the reliability world, especially in the utility world. A stable network system needs to plan wisely to meet user demands. To make it to reality, it needs to check the reliability of the network system. In this research, Sequential Monte Carlo is part of the Monte Carlo Simulation and one of the most used techniques to check the reliability by including variance reduction in the simulation. There will be two cases present in this paper, Case A and Case B, and the simulation for each case set with a different number of sequences with a comparable percentage of variance reduction. The importance of the sequence will determine the accuracy of the simulations. The reliability indices SAIFI, SAIDI, and CAIDI can be used to compare simulation accuracy. The best simulation is when the reliability indices recorded small values, however the size of sample should be larger to get high accuracy. Thus, it shows that the variance reduction with five sequences has a more efficient simulation than the two sequences.
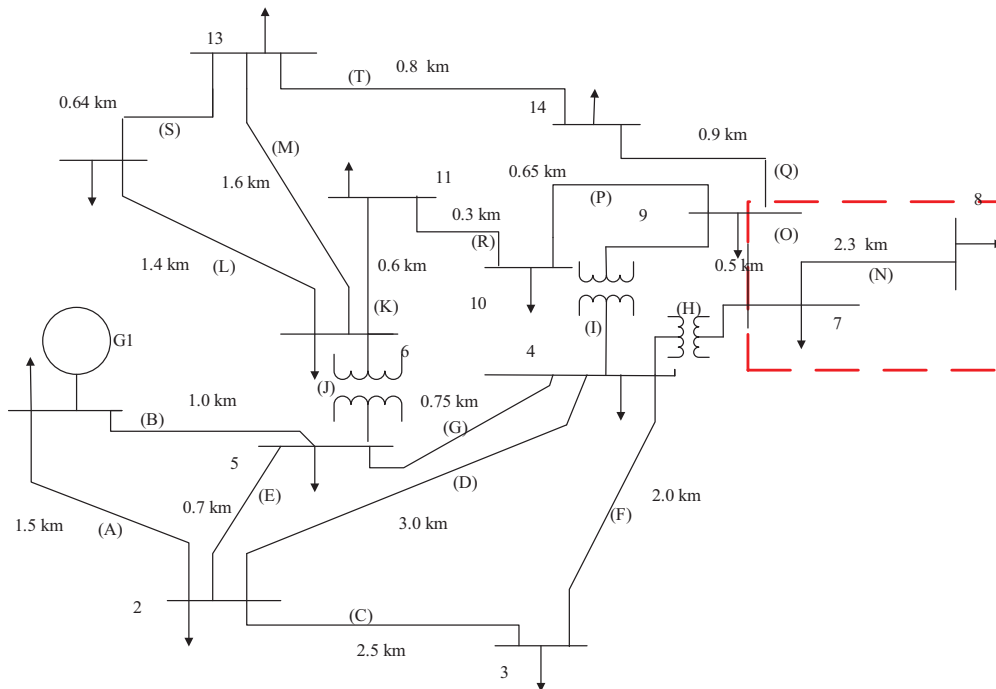
1   Introduction

Fig. 1 IEEE-14 Bus

Monte Carlo Simulation (MCS) is a common method and is widely used in reliability evaluation because of its effectiveness of this method [1]. It is a way to make sure the system is reliable to meet the demand [2]. Reliability evaluation can be solved in two basic steps, analytical approach, and simulation [3]. Analytical is the system is represented by a mathematical model and will be solved using a mathematical solution [4] and it cannot be applied to a complex network, while the simulation is suited to complex network and it samples according to the probability distribution of the components [5] listed are a few methods to evaluate reliability evaluation which are Bayesian Network