Abstract

Finding the Maximum Independent Set (MIS) is an NP-hard problem for which exact algorithms have exponential time complexity. Recently, machine learning has been tried on NP-hard problems as an alternative to heuristics and other approximation algorithms. Using reinforcement learning to solve MIS is a relatively new approach used in Abe, Xu, Sato, and Sugiyama, 2019. We propose improvements to the training and testing of the models used in Abe et al., and attempt to characterise how the models work. Similar methods can be used on other graph problems that can be framed as a Markov Decision Process, such as the Travelling Salesman Problem or the Dominating Set problem.