

# Abstract

Current state of the art Go programs utilize a relatively recent approach which combines the use of Monte Carlo simulations with an unbalanced tree search. Despite their relative lack of domain specific knowledge, these Monte Carlo based programs have largely surpassed the best conventional Go AI's, which are based on more standard approaches often used for games such as computer chess. This thesis discusses the major components that make up the best state of the art Go programs. It then describes the implementation of Klamshell, an AI which has been built from the ground up using many of these modern techniques. Through significant experimentation and refinement, we have improved the play strength of Klamshell, which has been test against GNUGo, one of the strongest conventional Go AI's available. During the testing process, we have observed the effects that certain heuristics have on the behaviour of the program. The resulting impact of various heuristics and strategies on the overall play strength of Klamshell are described in this thesis. Despite possessing significantly less complexity and Go knowledge than conventional AI's, Klamshell defeats GNUGo in a significant majority of games.